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PERIODICUM BIOLOGORUM

2nd INTERNATIONAL SYMPOSIUM ON REGIONAL ANAESTHESIA AND PAIN THERAPY

2nd Croatian Congress of Regional Anaesthesia and Analgesia

European Society of Regional Anaesthesia
Croatian Society of Regional Anaesthesia and Analgesia

Hotel Excelsior, Dubrovnik, Croatia
June 28 – July 01, 2007

2nd INTERNATIONAL SYMPOSIUM ON REGIONAL ANAESTHESIA AND PAIN THERAPY

2nd Croatian Congress of Regional Anaesthesia and Analgesia

European Society of Regional Anaesthesia
Croatian Society of Regional Anaesthesia and Analgesia

Hotel Excelsior, Dubrovnik, Croatia
June 28 – July 01, 2007

Organisers

Croatian Society of Regional Anasthesia and Analgesia Croatian Medical Association
European Society of Regional Anaesthesia ESRA

Coorganisers

Medical School, University of Zagreb
Medical School, University of Osijek
University Hospital Centre Zagreb
General Hospital Dubrovnik

Under the auspices of

Ministry of Science Education and Sports of the Republic of Croatia
Ministry of Health and Social Welfare of the Republic of Croatia
Croatian Medical Chamber
Croatian Medical Association
Dubrovnik City Council

Organising committee

Presidents:Katarina Šakić, Slobodan Gligorijević
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Symposium Director – CSRAA

Katarina Šakić, MD, PhD, DEAA; Professor of Anesthesiology and Intensive Care Medicine;
School of Medicine University JJ Strossmayer Osijek; School of Medicine University of Zagreb;
University Hospital Centar Zagreb; Croatia

Symposium Director – ESRA

Gligorijević Slobodan, MD, Past President ESRA, Institut für Anästhesiologie, Zürich, Switzerland
Editors of Periodicum biologorum supplement No 1; 2007
B. Vitale, K. Šakić, S. Kvolik

Invited speakers
Guest Faculty

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Narinder Rawal, MD, PhD, Secretary of ESRA, Professor of Anaesthesiology, University Hospital Örebro, Sweden

Jose De Andres, MD, PhD, Professor of Anaesthesiology and Pain Management, University Hospital Valentia, Valentia, Spain

Alain Borgeat, MD, PhD, Professor and Chief of Anaesthesiology, Orthopedic University Hospital Balgrist, Zurich / Switzerland

Barrie Fischer, MBChB FRCA, Consultant Anaesthetist, Department of Anaesthesia, Alexandra Hospital, Redditch, England

Nagy A Mekhail, MD, PhD, Professor of Anaesthesiology, Chaiman, Department of Pain Management,Cleveland Clinic, Cleveland, Ohio, USA

Leonardo Kapural, MD, PhD, Professor of Anaesthesiology, Director of Research, Pain Management Dept. Cleveland Clinic Foundation, Cleveland, Ohio, USA

George Miljanich, PhD, CEO, Airmid Inc, Redwood City, CA USA

Philip Morgan Hopkins, MD, PhD, Professor of Anaesthesiology, Academic Unit of Anaesthesia, St James's University Hospital, Leeds, UK

Andreas Bodenham, MD, Professor of Anaesthesiology, Academic Unit of Anaesthesia, St James's University Hospital, Leeds, UK

Thomas Grau, MD, PhD, Professor of Anaesthesiology, University Hospital Bergmannsheil Bocum, Germany

Edmund A.M. Neugebauer, MD, PhD, Professor and Chairman for Surgical Research, Institute for Research in Operative Medicine, Campus Cologne-Merheim, University of Witten/Herdecke, Cologne, Germany

Lennart Christiansson, MD, PhD, DEAA, EDIC, FCCP, Professor of Anaesthesiology, Consultant, Training Programme Director, Department of Surgical Sciences, Anaesthesiology and Intensive Care, Uppsala, Sweden

Franz Kehl, MD, PhD, DEAA, Professor of Anesthesiology and Intensive Care Medicine, Zentrum Operative Medizin, Universitätsklinikum Würzburg, Klinikum der Bayerischen Julius-Maximilians-Universität, Würzburg, Germany

Jordan Nojkov, MD, PhD, DEAA, Professor of Anaesthesiology, University Hospital Skopje, Skopje, Macedonia

Zorica Janković, MD, PhD, Associate Professor of Anesthesiology and Intensive Care Medicine, University Hospital Leeds, Leeds, UK

Nevenka Krčevski Škvarč, M. Sc, MD; Elected member of Slovenia in IASP, Splošna bolnica Maribor, Maribor, Slovenija

Medge Owen, MD, Associate Professor of Obstetric Anesthesia, Wake Forest University Medical Center, Winston-Salem, USA

Margaret Sedensky, MD, PhD, Professor of Anaesthesiology, University Hospitals of Cleveland, USA

Phil Morgan, MD, Professor of Anaesthesiology, Departments of Anesthesiology, Genetics and Pharmacology, University Hospitals of Cleveland and Case School of Medicine, Cleveland, OHIO, USA

Philippe Gautier, MD, Staff Anesthesiologist, Clinique St. Anne, St. Remi, Belgium

Srdjan S. Nedeljkovic, MD, Assistant Professor of Anaesthesia, Fellowship Director, Pain Medicine Program, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA,

Sasa Periskic, MD, Pain Management Center, Brigham and Wumens Hospital, Chestnut Hill, Massachusetts, USA

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Miloš Judaš, MD, PhD, Professor of Anatomy, Vice Chairmen of Croatian Institut for Research of Brain, Vice Dean for Science, School of Medicine University of Zagreb, Zagreb, Croatia

Ines Drenjančević-Perić MD, PhD, Assistant professor of Physiology and Immunology, Vice Dean for Science; School of Medicine University Josip Juraj Strossmayer Osijek, Osijek, Croatia

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Slobodan Mihaljević, MD, PhD, University Hospital Centar Zagreb, Department of anaesthesiology, reanimatology and intensive medicine, Zagreb, Croatia

Dear Colleagues and Friends,

On behalf **of Croatian Society of Regional Anaesthesia and Analgesia** and **European Society of Regional Anaesthesia and Pain Therapy** it is a great pleasure and honour to welcome you to the *II International Meeting on Regional Anaesthesia and Pain Management* in the beautiful city of Dubrovnik

Croatian Society of Regional Anaesthesia founded in 2003, is a scientific and educational organisation with the main goal and responsibility to accelerate the efforts in education as well as to spread knowledge and skills of regional anaesthesia and pain therapy. By organising this second joint meeting the young Croatian Society is proud to work closed with the oldest European Regional Anaesthesia Society. Just as well, ESRA is pleased and thankful for the occasion to help promoting regional anaesthesia and pain therapy in Croatia. Both Societies are looking forward to the further fruitful collaboration.

We are delighted to present you with wholesome scientific programme that covers many of the important aspects of regional anaesthesia and acute as well as chronic pain therapy. The refresher courses lectures will bring you up-to-date with the newest standards and techniques. The planed discussions and workshops will show and debate different theoretical and practical aspects. In all sessions, your point of view is important and we invite you to actively join in our congress discussions.

The industrial exhibition is present to inform us on the latest developments in drugs and equipment. Each company is a sponsor of the congress and we would like to thank them for they important support.

City of Dubrovnik, with its thousand year freedom and autonomy is a unique cultural and historical monument of medieval past of whole Mediterranean area. As such, the »Perl of the Adriatic« was officially recognised when the UNESCO declared the whole city as a world cultural heritage site. The social programme features guided city tours, excursion to the admirable Dubrovnik surroundings, visits to islands and villages and of course including exciting opening ceremony in one of the famous Dubrovnik castle as well as the congress gala dinner on the terrace of Excelsior hotel.

We sincerely hope that you will find the scientific and the social programme both stimulating and beneficial.

Welcome to Dubrovnik, Welcome to Croatia

Katarina Šakić, MD PhD
President HDRAA-HLZ (CSRAA-CMA)

S. Gligorijević, MD
Past President ESRA

GENERAL INFORMATION

Congress Venue

»Hotel Excelsior«,
Put Frana Supila 12, 20 000 Dubrovnik, Croatia

Official Symposium languages

English and Croatian (simultaneous translation will not be provided)

The Symposium is organised in a form of oral presentations, video projections, workshops and poster presentations. Oral or poster presentation will not be allowed without paying a registration fee (except invited speakers presentations).

Poster number corresponding to the abstract number will be posted at the top of the bord. Poster mounting: 8:30-9:00, poster removal 19:00. Presenting authors are required to attend his/her position 30 minutes before scheduled.

Presentation

Oral presentation can be in Croatian or English. All presenting materials must be in English.

Official emblems

All registrated participants and accompanying persons receive official Symposium emblem.

The registration fee includes:

Active/passive participation in scientific and promotive sessions,
Congress bag, congress materials, Periodicum biologorum supplement, refreshments, lunches

Social programme and programme for accompanying persons

Cultural and social events are planned for the Symposium participants.

- Welcome reception
- Galla Dinner
- Guided city tour
- Half-day and one-day excursions (ALS Ltd, Travel Agency& PCO), informations at desk

CONGRESS SECRETARIAT
prof. dr. sc. Katarina Šakić
HDRAA – HLZ
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PROGRAMME OVERVIEW

JUNE 28 (THURSDAY)

REFRESHER COURSES, Chairman: L.Christianseen, I. Drenjančević Perić

12:00–12:40 NEUROBIOLOGY OF PAIN
M. Judaš, Croatia

12:40–13:20 THE ROLE OF SODIUM AND POTASSIUM CHANNELS IN CARDIOTOXICITY INDUCED BY LOCAL ANAESTHETICS
I. Drenjančević-Perić, Croatia

13:20–14:00 UPDATE ON OPIOIDS IN NEUROAXIAL BLOCKADE
L.Christianseen, Sweden

14:00–14:40 HEMODYNAMIC CHANGES DURING NEUROAXIAL BLOCKS AND GENERAL ANAESTHESIA
F. Kehl, Germany

14:40–15:20 CONCEPTOF A »PAIN FREE CLINIC«– »FROM VISION TO REALITY«
Edmund A.M.Neugebauer, Germany

15:20–16:00 ZICONOTIDE: NEURONAL CALCIUM CHANNEL BLOCKER FOR TREATING SEVERE CHRONIC PAIN
G. Miljanich,USA

16:00–16:30 coffee break

16:30–17:10 ULTRASOUND GUIDED REGIONAL ANAESTHESIA
T. Grau, Germany

17:10–17:50 INTERVENTIONAL TECHNIQUES IN CHRONIC PAIN – WHAT IS EVIDENCE-BASED?
N. Mekhail, USA

17:50–18:30 LOCAL VERSUS GENERAL ANAESTHESIA FOR CAROTID ENDARTERECTOMY
A. Bodenham, UK

18:30–19:10 THE IMPACT OF LOCAL ANESTHETICS ON PERIOPERATIVE MICROCIRCULATION AND COAGULATION
S. Kvolik, Croatia

19:10–19:50 PREVENTION OF CHRONIC PAIN – ROLE OF ANAESTHESIOLOGIST
V. Majerić Kogler, Croatia

HALL B: FREE PAPERS PRESENTATIONS, WORKSHOPS

13:30–14:40 FREE PAPER SESSION (OP1-OP7)

15:00–16:00 W01 WORKSHOP I

Interventional techniques in chronic pain management – »my videos«
Chair: N.Mekhail, L.Kapural
Occipital peripheral nerve stimulation for haedache
Provocative discography
Transdiscal biacuplasty

16:30–18:00 W02 WORKSHOP II

Invasive chronic pain management
D.Chudy, Croatia
Neurosurgical treatment of chronic pain
B. Ferek Petrić, Croatia
Implantable systems for pain therapy

20.30 OPENING CEREMONY AND WELCOME RECEPTION REVELIN CASTLE

JUNE 29 (FRIDAY)

SYMPOSIUM I – CENTRAL NERVE BLOCKADE Chairperson: S.Gligorijević

08:30–08.55 NEW DEVELOPMENTS IN SPINAL ANAESTHESIA
S.Gligorijević, Switzerland

08:55–09:20 SPINAL ANAESTHESIA IN ELDERLY PATIENTS WITH SPECIFIC CARDIOVASCULAR CONDITIONS
K. Šakić, Croatia

09:20–09:45 SPINAL AND EPIDURAL OPIOID ANALGESIA IN POSTOPERATIVE PAIN – NEW INSIGHTS
N. Rawal, Sweden

09:45–10:10 EVIDENCE – BASED MANAGEMENT IN CHRONIC PAIN MANGEMENT: SPINAL CORD STIMULATION
De Andres J, Spain

10:10 DISCUSSION

SYMPOSIUM II – COMPLICATIONS OF REGIONAL ANAESTHESIA AND PAIN MANAGEMENT Chairperson: De Andres J

11:00–11.25 NEUROLOGIC DEFICIT AFTER CENTRAL NEURAXIAL BLOCK. WHAT TO DO?
Z. Janković, UK

11:25–11:50 COMPLICATIONS OF PERIPHERAL BLOCKS AND CATHETERS – WHAT TO DO?
A. Borgeat, Switzerland

11:50–12.15 COAGULATION DISORDERS AND REGIONAL ANAESTEHESIA
B. Tripković, Croatia

12:15–12.40 LIMITATIONS OF SCS IN AXIAL BACK PAIN
De Andres J, Spain

12:40 DISCUSSION

SYMPOSIUM III – NEWER TRENDS IN REGIONAL ANAESTHESIA FOR C-SECTION AND LABOR Chairperson: M. Sedensky

14:00–14:25 PHENYLEPHRINE VS. EPHEDRINE FOR CESAREAN SECTION – WHICH IS THE BETTER OPTION?
Ph Gautier, Belgium

14:25–14:50 EPIDURAL BLOOD PATCH – A COMMON SENSE APPROACH
M. Owen, USA

14:50–15:15 DO EPIDURALS SLOW DOWN THE PROGRESS OF LABOR, OR INCREASE THE RATE OF CAESAREAN SECTION?
M. Sedensky, USA

15:15–15:40 EPIDURAL ANALGESIA IN CROATIAN OBSTETRICS – ADVANTAGES AND DISADVANTAGES
D. Kopić, Croatia

15:40 DISCUSSION

SYMPOSIUM IV – REGIONAL ANAESTHESIA AND ANALGESIA IN PAEDIATRICS – AN UPDATE Chairperson: J. Nojkov

16:30–16:55 PLASMA CHOLINESTERASE INHIBITION AFTER LOCAL ANESTHETICS
Lj. Popović, Croatia

16:55–17:20 SPINAL ANAESTHESIA IN INFANTS AND CHILDREN
J. Nojkov, Macedonia

17:20–17:45 CAUDAL ANALGESIA AND ANESTHESIA IN CHILDREN – IT COULDN'T BE EASIER
Ph. Morgan, USA

17:45–18:10 HIGH BLOCKS IN OB ANESTHESIA AND IMAGING OF PERIPHERAL NERVE BLOCKS
Ph. Gautier, Belgium

18:10 DISCUSSION

HALL B FREE PAPERS PRESENTATIONS – WORKSHOPS

08:30–10:00 W03 WORKSHOP III

Upper extremity blocks
Brachial plexus
Proximal approaches: interscalene, infraclavicular
Distal approaches: nerve blocks at elbow and wrist level
Demonstrators/speakers: A. Borgeat, B. Fischer

11:00–12:30 W04 WORKSHOP IV

Lower extremity blocks
Proximal approaches
Psoas compartment, femoral and sciatic nerve blocks
Distal nerve blocks
Sciatic and saphenous nerve block at the knee and ankle level
Demonstrators/speakers: S. Gligorijević, B. Fisher

13:00–14:00 FREE PAPER SESSION (P1-P7)

14:00–15:00 W05 WORKSHOP V

Ultrasound guided plexus brachial block
Demonstrators/speakers: Ph. Hopkins

15:00–16:00 W06 WORKSHOP VI

Ultrasound for central and pheripheral nerve blocks in adults
Demonstrators/speakers: T.Grau, S. Mihaljević

16:30–17:30 W07 WORKSHOP VII

Ultrasound for peripheral and central nerve blocks in children
Demonstrators/speakers: T.Grau, S. Mihaljević

17:30–18:30 W04 WORKSHOP IV

Lower extremity blocks
Proximal approaches
Psoas compartment, femoral and sciatic nerve blocks
Distal nerve blocks
Sciatic and saphenous nerve block at the knee and ankle level
Demonstrators/speakers: S. Gligorijević, B. Fisher

20.00 CONGRESS DINNER, HOTEL EXCELSIOR » Terasa Palma«

JUNE 30 (SATURDAY)

SYMPOSIUM V – AMBULATORY SURGERY – CURRENT STATUS Chairperson: N. Rawal

08:30–08:55 REGIONAL ANAESTHESIA IN AMBULATORY SURGERY – DISCARGE AND FOLLOW UP
N. Rawal, Sweden

08:55–09:20 CENTRAL NEURAXIAL BLOCKS FOR DAY SURGERY
V. Golubović, Croatia

09:20–09:45 PERIPHERAL NERVE BLOCKS IN TRAUMA AND EMERGENCIES
D. Bartolek, Croatia

09:45–10:10 WHAT TO DO IF YOUR BLOCKS ARE NOT SUCCESSFUL? WAY OUT BLOCKS?
B. Fischer, UK

10:10 DISCUSSION

SYMPOSIUM VI – RATIONAL USE OF NEW MODALITIES FOR CHRONIC PAIN I Chairperson: L. Kapural

11:00–11:25 SPINAL CORD STIMULATION FOR CHRONIC ABDOMINAL PAIN
L. Kapural, USA

11:25–11:50 TOPICAL ADMINISTRATION AND PERIPHERAL NERVE BLOCKS IN THE MANAGEMENT OF CHRONIC PAIN
De Andres J, Spain

11:50–12:15 MINIMALY INVASIVE INTERVENTIONS FOR VERTEBRAL AND DISCOGENIC PAIN
S. Nedeljković, USA

12:15–12:40 ESRA GOOD PRACTICE GUIDELINES – HOW TO AVOID NEUROLOGICAL COMPLICATIONS
B. Fischer, UK

12:40 DISCUSSION

SYMPOSIUM VII – NEW MODALITIES FOR CHRONIC PAIN II Chairperson: N Krčevski Škvarc

14:00–14:25 CANCER PAIN: FARMACOTHERAPY GUIDELINES
R. Dobrila Dintinjana, Croatia

14:25–14:50 SPINAL ENDOSCOPY AND PAINFUL HARDWARE SYNDROME
S. Periskic, USA

14:50–15:15 DEVELOPMENT OF ORGANIZED PAIN TREATMENT IN CROATIA, 1979–2006.
M. Persoli Gudelj, Croatia

15:15–15:40 REHABILITATION AND PAIN TREATMENT IN PALLIATIVE CARE
N Krčevski Škvarč, Slovenia

15:40 DISCUSSION

HALL B: FREE PAPERS PRESENTATIONS, WORKSHOPS

08:30–09:40 FREE PAPER SESSION (OP8a-OP14a)

10:00–11:00 W03 WORKSHOP III

Upper extremity blocks
- Brachial plexus
- Proximal approaches: interscalene, infraclavicular
- Distal approaches: nerve blocks at elbow and wrist level

Demonstrators/speakers: A. Borgeat, B. Tripković

11:00–12:00 FREE PAPER SESSION P II (P8-P15)

12:00–14:30 FREE PAPER SESSION PIII (P16-P24)

JULY 01, 2007 (SUNDAY)

EXCURSIONS

JUNE 28 (THURSDAY)ORAL PRESENTATIONS

13:30–13:40 OP1 REGIONAL ANAESTHESIA FOR CAROTID ENDARTERECTOMY
Ajdinović A, Mrzljak Natalija, Ratković Senka, Matić Ivo, Kopić Jasminka, Lučić Ivan, H. Palenkić

13:40–13:50 OP2 CAROTID ENDARTERECTOMY IN UNIVERSITY HOSPITAL »SESTRE MILOSRDNICE»; EVALUATION AND PERSPECTIVE
Ž. Ivanec, D. Desyo

13:50–14:00 OP3 MORE INTRAOPERATIVE HYPOTENSION DURING GENERAL VERSUS LOCAL ANESTHESIA FOR CAROTID ENDARTERECTOMY
A. Rakipović-Stojanović, S. Kvolik, K. Šakić, V. Lehner, L. Prlić, K. Pinotić

14:00–14:10 OP4 HAEMODYNAMIC EFFECTS OF EPIDURAL ANESTHESIA WITH 0,5% BUPIVACAINE AND S-(+)-KETAMINE
S. Mihaljević, K. Šakić, V. Stambolija, M. Majerović, Lj. Mihaljević

14:10–14.20 OP5 SELECTIVE SPINAL ANAESTHESIA IMPROVES THE EARLY PROFILE OF PATIENTS UNDERGOING GYNECOLOGIC SURGERY.
L. Kalagac Fabris, A. Maretić, V. Golubović

14:20–14:30 OP6 ANGOTENSIN-CONVERTING ENZYME INHIBITORS (ACEI) AND THE INFULENCE OF THE FLUID REPLACEMENT DURING SPINAL ANAESTHESIA
D. Bartolek, M. Romčević, A. Jokić

14:30–14:40 OP7 ANTIBACTERIAL ACTIVITY OF 0.5% ISOBARIC BUPIVACAINE AND 0.5% HYPERBARIC BUPIVACAINE *IN VITRO*
LJ. Mihaljević, B. Bedenić, S. Mihaljević, K. Šakić, J. Radonić, D. Plavec

JUNE 30 (SATURDAY) ORAL PRESENTATIONS

08:30–08:40 OP8a IMMEDIATE INFLUENCE OF POSTOPERATIVE ANALGESIC TECHNIQUES ON RESPIRATORY FUNCTION AFTER SCOLIOSIS SURGERY
T. Goranović, K. Šakić, Š. Šakić, M. Milić

08:40–08.50 OP9a PLEURAL ANALGESIA
M. Rakarić Poznanović

08:50–09:00 OP10a CONTINUOUS FEMORAL NERVE BLOCK IMPROVE ANALGESIA AFTER ANTERIOR CRUCIATE LIGAMENT SURGERY
B. Maldini, S. Janković, Š. Šakić, S. Antolić, D. Djulepa

09:00–09:10 OP11a SPINAL AND GENERAL ANAESTHESIA, COMORBIDITIES AND THROMBOPROFYLAXIS FOR ORTHOPEDIC HIP AND KNEE ARTHROPLASTY
I. Matić, K. Šakić-Zdravčević, M. Jurjević, S. Ratković

09:10–09:20 OP12a ASSESSMENT OF PAIN INTENSITY AND PATIENT SATISFACTION WITH ANALGESIA AFTER OPERATIVE PROCEDURES IN THE MUSCULOSKELETAL SYSTEM
J. ĐurasekJ V., Slaviček, V. Kovačić-Vicić, I. Dovžak-Bajs

09:20–09:30 OP13a INTRAPERITONEAL ANALGESIA FOR LAPAROSCOPIC CHOLECYSTECTOMY: BUPIVACAINE VERSUS BUPIVACAINE WITH TRAMADOL
S. Golubović, V. Golubović, M. Cindrić-Stančin, V. Sotošek Tokmadzić

09:30–09:40 OP14a INFLUENCE OF LUMBAR SYMPATHETIC BLOCK ON PAIN AND ALLODYNIA IN PATIENTS WITH COMPLEX REGIONAL PAIN SYNDROMES OF THE LOWER EXTREMITY
I. Radoš, M. Fingler, K. Šakić Zdravčević, D. Ivić, G. Fingler

09:30–09:40 OP15a NEUROCOGNITIVE FUNCTION AFTER CAROTID ENDARTERECTOMY (CEA) UNDER REGIONAL AND GENERAL ANESTHESIA
B. Mazul-Sunko, M. Tadinac-Babić, I. Hromatko, A. Čima, Ž. Ivanec,A. Gvozdenović, K. Kličan, H. Krolo

POSTER SESSION

JUNE 29 (FRIDAY)
PI

13:00–13:07 1_PI COMBINATION OF ISOBARIC BUPIVACAINE AND FENTANYL, VERSUS ISOBARIC BUPIVACAINE IN SPINAL ANAESTHESIA FOR CESAREAN SECTION
S. Popovska, V. Bozinovska, N. Sikov

13:09–13:16 2_PI BUPIVACAINE VS. LEVOBUPIVACAINE IN EPIDURAL ANALGESIA DURING LABOR
M. Perković, D. Kopić, A. Ujević, S. Pavičić, N. Elezović

13:18–13:25 3_PI COMPARISON OF THE EFFECTS OF DIFFERENT METHODS OF ANESTHESIA ON CENTRAL HEMODYNAMICS DURING LAPAROSCOPIC GYNECOLOGIC OPERATIONS
E. Shifman, I. Fedulova

13:27–13:34 4_PI NEOSTIGMIN-ADJUVANS IN SPINAL ANESTHESIA
L. Palasevska, M. Krivasija, I. Palasevska.

13:36–13:43 5_PI LEVOBUPIVAKAINE SPINAL ANESTHESIA FOR HIP SURGERY
M. Barković, D. Kaplan, R. Salamon

13:45–13:52 6_PI LOWER LIMB AND SCROTAL OEDEMA FOLLOWING KNEE ARTHROSCOPY WITH TOURNIQUET IN SPINAL ANAESTHESIA
I. Haršanji-Drenjančević, D. Ivić, B. Žulj, D. Vučinić

13:53–14:00 7_PI COMBINATION OF GENERAL AND REGIONAL ANESTHESIA IN ABDOMINAL AORTA SURGERY
S. Sitkin, D. Federyakin

JUNE 30 (SATURDAY)
PII

12:00–12:07 8_PII THE BIBLOCK TECHNIQUE – AXILLARY BLOCK WITH UNILATERAL SPINAL ANAESTHESIA AND AXILARY BLOCK WITH SPINAL ANAESTHESIA
V. Stambolija, S. Mihaljević, K. Sporčić

12:09–12:16 9_PII COMBINED USE OF SUPRACLAVICULAR BRACHIAL PLEXUS BLOCK AND FEMORAL NERVE BLOCK FOR ELECTIVE UPPER-EXTREMITY SURGERY REQUIRING LARGE SKIN GRAFT
S. Mihaljević, T. Tomić Mahečić, M. Mirić

12:18–12:25 10_PII COMBINED USE OF INTERSCALENE BRACHIAL PLEXUS BLOCK AND SUPRACLAVICULAR BLOCK FOR SHOULDER SURGERY
T. Tomić Mahečić, M. Mirić, S. Mihaljević, Lj. Mihaljević, A. Ivandić, Š. Šakić

12:27–12:34 11_PII EFFECT OF TRIAMCINOLONE ON PROLONGATION OF ROPIVACAINE EFFECT IN NERVE BLOCK
Hee-Soo Kim, Deok-Man Hong, Jin-Tae Kim, Chong Sung Kim, Seong Deok Kim

12:36–12:43 12_PII OPTIMAL ANGLE OF NEEDLE INSERTION FOR CAUDAL BLOCK IN ADULTS
Duck Mi Yoon, Ho Dong Rhee

12:45–12:52 13_PII GENERAL AND CAUDAL ANAESTHESIA IN CHILDREN DURING APPENDECTOMIES
A. Hasani, S. Azizi

12:53–13:00 14_PII INCISIONAL LOCAL ANAESTHESIA WITH TRAMADOL VERSUS BUPIVACAINE OR PAIN RELIEF AFTER PEDIATRIC MINOR SURGERY
Lj. Radevska, T. Ivanoski, V. Ristevski, E. Ivanov

JUNE 30 (SATURDAY)
PIII

13:00–13:07 15_PIII POSTOPERATIVE PAIN – COMPARISON OF TWO SURGICAL TECHNIQUES
L. Palasevska, M. Krivasija, I. Palasevska

13:09–13:16 16_PIII HEMODYNAMIC EFFECTS OF BUPIVACAINE vs. LEVOBUPIVACAINE IN SPINAL ANAESTHESIA FOR HYPERTHENSIVE UROLOGY PATIENTS UNDERGOING TRANSURETHERAL SURGERY
K. Šakić, M. Grljušić, V. Vrbanović, N. Goreta, M. Grković, V. Bekavac, A. Peršin, L. Šakić

13:18–13:25 17_PIII PREEMPTIVE ANALGESIA WITH MIDAZOLAM AND DICLOFENAC FOR HERNIA REPAIR PAIN
A. Hasani, H. Maloku, E. Borovci

13:27–13:34 18_PIII OSTEOPOROTIC PAIN AND TRANSDERMAL BUPRENORFINE-TRANSTEC CASE REPORT
E. Mijač-Gulišija, D. Kopić, T. Bakotin, I. Balić

13:36–13:43 19_PIII PAIN MANAGEMENT IN CHRONIC CERVICAL SPINE SYNDROME
I. Adanić-Mikloška, T. Kukin, M. Vukić

13:45–13:52 20_PIII EFFECTIVENESS OF STELLATE GANGLION BLOCK ON CHRONIC HEADACHE
Doo Ik Lee, Keon Sik Kim, Su Young Kiom, Sabina Lim, Jae Dong Lee, Do Young Choi, Yun Ho Lee

13:53–14:00 21_PIII SPLINT TREATMENT OF OSTEOARTHRITIS OF TEMPOROMANDIBULAR JOINT
T. Badel, J. Pandurić, M. Marotti, J. Keros, S. Kocijan Lovko, J. Kern

14:01–14:08 22_PIII POSTDURAL PUNCTURE HEADACHE
S. Bošnjak

14:09–14:16 23_PIII OPIOIDS IN SEVERE CHRONIC PAIN
I. Adanić-Mikloška

14:17–14:24 24_PIII POSTOPERATIVE INTRATHECAL ANALGESIA FOR PRIMARY TOTAL HIP ARTHROPLASTY – COMPARATIVE CLINICAL EXAMINATION OF TWO DIFFERENT SMALL DOSES OF MORPHIUM HYDROCHLORIDE
V. Damevski, G. Damevska, L. Palasevska, J. Nojkov

14:25 DISCUSSION

SHORT PAPERS

PERIODICUM BIOLOGORUM
VOL. 109, Suppl 1, 2007
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Short paper

Developement of organized pain treatment in Croatia, 1979–2006.

MARIJANA PERSOLI-GUDELJ, MIRA FINGLER and MIRJANA LONČARIĆ-KATUŠIN

The Croatian Association for the Treatment of Pain – Croatian Medical Assocation (CATP-CMA)

The intention of the authors is to give a short overview of the introduction of organized pain treatment and pain services in Croatia. The presentation of the historical development of the organized treatment of pain in Croatia which started in the Outpatient service and has now developed into The Croatian Association for the Treatment of Pain.

How did we start?

The first outpatient service for pain treatment was established already in 1979. This is considered to be the official beginning of the organized treatment of pain in Croatia. The outpatient service was established as a part of the Department of Anesthesiology in accordance with the IASP rules and regulations. In 1992 the outpatient service developed into the Department of Pain, which provides treatment of chronic pain with special emphasis on cancer pain and acute postoperative and obstetric pain. The activities of the outpatient service also include education: organization of seminars, publication of manuals on pain, participation in international multicentric studies, testing of opiates, organization of postgraduate studies, organization of seminars with international participants.

In 1994 the Department of Pain initiated its cooperation with the Croatian Association of Anesthesiology (main purpose: organizing Pain treatment centers) and with the Croatian Association for Palliative Care. (one of the basic concerns is cancer pain treatment).

The Department of anesthesiology at the Faculty of Medicine in Zagreb joined in these activities in 1997 (basic concern: pain management- undergraduate and postgraduate studies).

The joint effort of these associations resulted in:

1. 1995 – organizing the algorithm of pain centers
2. 1996 – proposals regarding this activity were sent to the Ministry of Health – no response.
3. 1997 – a series of one-day symposia started, with contributions of: Vittorio Ventafridda, Ederbard Klaschik, Jacek Luczak, Manfred Zimmerman, Nevenka Krčevski-Škvarč and so on…
   The topics of the symposia were: Malignant pain treatment,
   modern approach
   a three-step analgesic ladder – WHO
   analgesics – opioids / non opioids
   ethics, palliative medicine
   pain treatment in the new millennium
4. 1997 – the first oral morphine with prolonged action was registered
5. 2000 – a postgraduate course was established

»Chronic malignant pain – differential diagnosis and treatment« – with contributions of many professors from the Zagreb Faculty of Medicine.

The Croatian Association for the Pain Treatment – Croatian Medical Association was formally established on March 31, 2000. The application to join IASP was submitted in 2001.

2002 – (San Diego) we became an IASP Chapter in formation.

2005 – (Sydney) we became the full member of the IASP.

2006 – 1st Congress of the CATP with International participation.

Croatian Association for the Trea7tment of Pain today has around 200 multidisciplinary members (50% of which are anesthesiologists). There are several special interest groups in formation: acute pain, neuropathic pain, cancer pain, pain in children.

A network of organized pain treatment units has been developed in three centres (Zagreb, Karlovac, Osijek) and seventeen outpatient departments, mostly within anesthesiology departments.

We published:

- Book of Neuropathic Pain,
- Teaching books: Chronic pain, Children pain,
- Proceedings of the 1st Congress of the CATP. Three Chapters on Pain.
- University textbook »ABC – General surgery part I, II, III) including three chapters on pain.
- Booklet for Patient brochure »Pain Treatment«.

We translated:

- EFIC booklet »Pain Treatment«, »Brief Pain Inventory« and other educative material

We are training volunteers in: home care, palliative care, retirement homes etc.

Since 2002, we have been actively involved in the EFIC »Europa against Pain« project.

Following suggestions from EFIC based on the Letter from the President, we undertake promotion activities on the Global Day against Pain and the Europa Week against Pain. (Europa and Croatia against Pain)

We are currently developing a program (training) for sub-specialist training in the area of Pain Medicine at the Faculty of Medicine Zagreb, Department of Anesthesiology. The program adheres to EFIC and IASP standards. 16/03/2006 the Program was submitted to the Ministry of Health for approval. The program has not been accepted so far despite our interventions.

Program for the future activities:

National consensus on pain treatment according to the IASP and WHO propositions – developing the national program of Pain

Modern pain treatment education

Organizing pain treatment units network

Collaboration with the Zagreb Faculty of Medicine and related professional associations at national and international levels

Conclusion

Although very young, the Croatian Association for the Treatment of Pain has become known nationally and internationally. Articles on this subject have been appearing in national and international magazines. The Croatian Association actively participates at national and international conferences. It encourages the establishment of regional centers for the treatment of pain.

We fully accept the IASP and EFIC program which help us in developing our own Chapter.

We maintain good cooperation with the pharmaceutical industry which supports our efforts in the development of a modern approach to the treatment of pain.

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Short paper

Local versus general anaesthesia for carotid endarterectomy

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Carotid endarterectomy reduces the risk of stroke in people with recently symptomatic, severe carotid artery stenosis. However, there are significant perioperative risks which may be lessened by performing the operation under local rather than general anaesthetic. It is tempting to speculate that local anesthesia (LA) may be of benefit due to preserved cerebral autoregulation, higher cerebral perfusion pressure of more selective use of shunts or the other more general perceived benefits of local anaesthesia. However there is insufficient evidence from randomised trials comparing carotid endarterectomy performed under local and general anaesthetic. Non-randomised studies suggest potential benefits with the use of local anaesthetic, but these studies may be biased. An analysis of studies comparing LA versus general anesthesia (GA) for carotid endarterectomy has been performed on behalf of the Cochrane Collaboration *(1)*. More randomised studies are needed.

Carotid endarterectomy may be performed under general or local anaesthesia or various combinations of the two e.g. awakening for neurological assessment in the middle of a general anesthesia. Local anaesthesia can further be divided into local infiltration by surgeon/anaesthetist or both, deep and superficial cervical plexus block, or cervical epidural. There is no level 1 evidence to guide practice in this area.

The debate about local versus GA is relevant to carotid endarterectomy and other surgical procedures particularly in the higher risk patient. In the more general surgical population, there is little hard evidence to show benefit for the use of local anaesthesia during surgery and postoperative neuroaxial blockage, over a GA and conventional opiate analgesics post op, despite enthusiasm from advocates of loco-regional techniques *(2, 3)*.

Patients undergoing carotid surgery represent a high risk group with extensive co-morbidities including advanced age, cerebrovascular, cardiac, respiratory, and renal disease. The perioperative risks of major complications including stroke, myocardial infarction, and death is about 5–7% in major contemporary series. The size of incision and area of dissection would suggest that carotid surgery should not induce the same magnitude of stress response when compared to open thoracic or abdominal surgery.

The GALA study is a multinational large randomised study of GA versus LA for carotid endarterectomy. Nearly 3000 patients have been enrolled making it the largest GA versus LA study to date. The randomisation code has not been broken as the trial recruitment runs until 2007/8. Further information is available at www.galatrial.com. This study provides a very large interesting database of carotid surgery and anaesthesia. For example there are concerns in the UK, that in many patients surgery is delayed too long after the presenting neurological event, and hence lessens potential benefit.

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Short paper

Carotid endarterectomy in university hospital »Sestre milosrdnice«; evaluation and perspective

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Background and purpose: Carotid endarterectomy (CEA) is a preventive operation with accepted perioperative risk (30 days) of great complication for asymptomatic patients lesser then 3%, and for symptomatic patients lesser then 5% (cerebral stroke, heart attack and death). Surgical and anesthetic technique should follow recent criterions about justification for operation in relation with perioperative risk.

Although until today were done many studies about influence of anesthesia on possible complication and outcome of CEA, it is still controversial. We are waiting answers of GALA study *(1),* which compares perioperative results of CEA in locoregional and general anesthesia. We are included in this study, also. From 2002, we performed CEA predominantly (89%) in vigil patients in regional anesthesia.

Materials and methods: From 2002, we statistically monitored perioperative sequence of our patients. For this analysis, we used data of two groups of patients through period from October 2002 to January 2004 (294 patients) and from February 2004 to March 2006. (324 patients), and compared them with data published in international studies, and with our beforehand analysis of 2342 patients from 1970. to 2004.13 We tried to analyze were the complications of our patients in range of published complications in medical literature. *(2, 3, 4, 5, 6, 7, 8, 9, 10, 11)* (Tables 1, 2)

TABLE 2

Demographic characteristics of patients.

Patients	n	%
Age (y)	67,2 (40/99)	
Body mass (kg)	78,4 (48/138)	
Men	201	68,3
Women	93	31,7
Symptomatic carotid disease	219	86,9

TABLE 1

Carotid endarterectomies (CEA) in group of 294 patients.

	n	%
Total CEA	294	100
General anesthesia	31	11
Regional anesthesia	263	89

Results: The greatest improvements we find considering lethal outcome related with cardiac complications (1.87% to 0.67% and 0.61%) what is statistically very significant. In addition, we find small, but statistically significant drop in neurological complications (1.93 % to 1.23%) (Table 3).

TABLE 3

Major complications of CEA in some published studies and in our patients.

Study	No of patients	Perioperative stroke/TIA+			Perioperative AMI++			Death		
		RA*	GA**	p	RA	GA	p	RA	GA	p
Allen *et al.*, 1994.	679				0.6	2.50	0.07			
Becquemin *et al*. 1991.	385				0%	3.80	<0.05			
Corson *et al.* 1987.	399			<0.025						
Rockman *et al.* 1996.	1763	1.1	3.2	<0.001	0.6	1.20		0.9	0.9	NS
Onur *et al*. 2003.	329	1.1	7.9	<0.001						
Rothwell *et al*. 1996. meta analysis	25 studies	0.91					1.62			
Kalko *et al*. 2006.	300	3.0			0%			0.3		
Olcott *et al*. 2000.	763	2.20					0.66			
S.M. 1970.–2004.***	2342		1.92			?			1.87	
S.M. 2004.***	294			NS	0.67			0.67		<0.001
S.M. 2006.***	324	1.93		<0.05	0.30	2.50		0.61		<0.001

* RA=regional anesthesia, **GA=reneral anesthesia, ***University Hospital »Sestre milosrdnice«
+TIA=transient ischemic attack, ++AMI=acute myocardial infarction

Conclusions: Analysis of the results of the respective vascular center is background for possible necessity of changing anesthetic technique. Many centers have excellent results of carotid endarterectomy in general anesthesia, with or without shunting. If the results are good, then modification of techniques may not improve outcome of operation.

Large studies indices that are no differences in cardiac complications between CEA performed in general anesthesia or in regional anesthesia. However, perioperative neurological complications are in large studies statistically significant at CEA performed in general anesthesia or in percutaneous transluminal angioplasty. Carotid balloon angioplasty (CBA) and carotid stenting (CAS) are encumbrance with 1.5 % complication of angiography, so that CEA remains a gold standard for treatment of carotid stenosis in centers of excellence, and CBA and CAS as complementary methods for selected cases.

In our hospital, regional anesthesia for this type of surgery is a method of choice, because the cardiac perioperative complications are considerably lower in comparation with general anesthesia. This is not in concordance with other published studies, which find no differences in cardiac complications between two types of anesthesia. Reason for that is probably suboptimal perioperative management (anesthesia, postoperative intensive care etc.) in endangered patients. Small drop in neurological complications indices to benefit of regional anesthesia, and agrees with recent published studies.

Compared our results with other published studies we can conclude that the surgical successfulness of this procedure in our hospital is equal as in published studies, and that the low level of complications becomes lower last years *(13)*.

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Short paper

Regional anaesthesia for carotid endarterectomy

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Abstract

Backgronud. Atherosclerotic carotid disease is one of the leading causes of mortality in the elderly, in western countries. The main cause of carotid stenosis is atherosclerotic disease, which puts patients at risk for cerebral and cardiac complications. Carotid endarterectomy is a preventive surgical procedure, which can be performed under general anesthesia (GA) or regional (RA) anesthesia. The aim of this study was to show the anesthetic potential of a superficial cervical block and postoperative analgesia management.

Prospective research was performed on 10 patients who had undergone carotid endarterectomy under regional anesthesia (superficial cervical block) at the Departement of Surgery, General Hospital Slavonski Brod, during the year 2006. The average age was 62 and ASA II or III were used. After preoperative preparation and informed consent all patients recieved 2,5–5 mg i.v. midazolam for premedication.

Superficial cervical blocks were performed by using 0,25% levobupivacaine (1,5 mg/ kg + 0,2 mg epinephrine). Invasive blood pressure monitoring was obtained before RA and 50mg meperidine was given i.v. as analgesia for the block procedure. Blood pressure, level of consciouness, speech ability, contralateral motoric potential, pain score VAS (visual analog scale) were monitored continously during surgery and every half hour postoperatively in the ICU.

Conclusion. Nine patients had unchanged neurogical status with excellent hemodynamic stabillity (blood pressure and pulse oscillation less 20 %). Anesthetic potential or effectiveness was sufficient; VAS was 1–2 except during the surgical approach to the perivascular sheeth when documented as VAS 3–6. Postoperatively, during the following eight hours, there was no need for analgesic supplementation (VAS level 1–2). Based on the results, a superficial cervical block was and is the choice of anesthesia for carotid endarterectomy.

Key words: regional anesthesia, carotid endarterectomy, cervical block

INTRODUCTION

Atherosclerotic carotid disease is one of the leading causes of mortality in the elderly, in western countries. The main cause of carotid stenosis is atherosclerotic disease, which puts patients at risk for cerebral and cardiac complications. More than 700 000 strokes occur in the United States annually, and stroke remains to be the third leading cause of death. As many as 20% of strokes are due to carotid artery disease. Therapy methods include surgery, stenting in appropriate settings and conservative treatment directed to the regulation of blood pressure using antiagregational/ anticoagulation drugs, as well as statins for underlying chronic disease *(1)*. Based on epidemiological data within a general population, the American Society of Neuroimaging cosponsored by Societty of Vascular and Interventional Neurology, USA, recommend screening for carotid stenosis among high risk persons within a general population: patients undergiong open heart surgery, patients with periferal vascular disease, abdominal aortic aneurysms, renal artery stenosis, patients after radiotherapy for malignancies of the head and neck, patients following carotid endarterectomy or carotid artery stent placement, patients with retinal ischemic syndroms; patients with syncopa, dizzines, vertigo, tinitus; and patients with family history of vascular disease and hyperhomocystinemia *(2)*.

Carotid endarterectomy (CEA) is a preventive surgery, which significantly reduces the risk of stroke. Halliday et al. investigated the balance of surgical risk and long term benefits from carotid endarterectomy among 3120 asymptomatic patients younger than 75 years of age with carotid artery diameter reduction of 70% and more on ultrasound during a ten years period at St Georgec s Medical School, London. Immediate CEA reduced 5–year stroke risk from about 12% to about 6% including 3% of perioperative hazard *(3)*. Chambers and Donan searched through the Cochrane Stroke Group Trials Register and evaluated three trials which included 5223 patients with asymptomatic carotid stenosis. Perioperative stroke death rate was 3% and CEA reduced risk of ipsilatral and any stroke approximately 30 % over three years *(4)*.

Percutaneous transluminal angioplasty and stenting are useful alternatives to CEA, particulary for lesions not suitable for surgery: stenosis position, the neck after dissection, irradiation, malignancy… Data from randomised trials suggest that two treatments have similar early risk of death or stroke and similar long term benefits *(5, 6)*.

Occlusive carotid disease is a disease of the elderly. The majority of surgical patients are under high surgical and anesthesiological risk with many underlying chronic diseseases. Reed et al. in retrospective analysis of 1370 CEA peformed during 1900–1999 year, Division of Vascular Surgery at the University of Cincinati Medical Center,Ohio, USA found several preoperative risk factors: age older than 80 years, congestive heart failure, chronic obstructive lung disease, renal failure, contralateral carotid artery occlusion, reccurent ipsilateral carotid artery stenosis, ipsilsteral hemispheric symptoms within 6 weeks and recent coronary bypass grafting; CABG *(7)*. Before surgery every chronic disorder should be stabilized including blood pressure, cardiac and respiratory functions, neurological status (at least 6 weeks after an ischemic neurological event), coagulation status, and other biochemical blood parameters. Diabetes and poor glucose control are significantly associated with increased risk of perioperative stroke or transient ischemic attacks, myocardial infarction and death *(8)*.

The surgical procedure can be performed under general anesthesia (GA) or regional (RA) anesthesia. The advantages of general anesthesia is cardiac and cerebral protection by iv. or inhaled anestethics, airway control and patient comfort, but the big disadvantage is lack of adequate neurological monitoring which has been associated with an increase of intraoperative shunting, perioperative stroke and longer duration of hospital stay *(9)*.

Regional anesthesia for CEA can be performed as a local infiltration of the surgical area, with cervical epidural anesthesia (rare) and as a block of the deep and superficial cervical nerve plexuses. Today the most common regional anesthetic procedures are blocks of the deep and/or superficial cervical nerve plexuses. Regional anesthesia enables persistent neurological monitoring and improves more hemodynamic stability and better postoperative analgesia *(10)*. The disadvantages of RA sometimes can be the inability for airway and ventilation/respiration control, poor anesthetic potential or effectiveness, systemic side-effcts of local anesthetics, accidental intravascular or intrathecal injection and patient discomfort. Unfortunately, sometimes local nerve injury and paralysis can also occur. There are case reports about acute respiratory failure after deep cervical plexus blocks as a result of bilateral reccurent laryngeal nerve paraysis *(11)*.

The aim of this study was to show anesthetic potential of superficial cervical blocks and their ability to obtain postoperative analgesia effectiveness.

METHODS

A prospective research study was performed on 10 patients who have undergone carotid endarterectomy under regional anesthesia (superficial cervical block) at the Departement of Surgery, General Hospital Slavonski Brod, during the year of 2006. The average age was 62, and ASA II or III were used. Anamnesticaly all patients had generalized vascular disease. After preoperative preparations and informed consent, the patients underwent anesthesia and the surgical procedure. All patients received 2,5–5 mg midazolam i.v. as premedication.

A superficial cervical block was performed by infiltrating typical anatomical points with 30–40 ml 0,25% levobupivacaine (1,5 mg/ kg) and epinephrine 0,2 mg. Invasive blood pressure monitoring was obtained before regional anasthesia and 50mg meperidine was given i.v. as analgesia for the block procedure.

Blood pressure, level of consciouness, speech ability, contralateral motor potential, and pain score VAS (visual analog scale) were monitoried continously during the surgery, every five minutes and every half hour postoperatively in the ICU.

RESULTS

Nine patients had unchanged neurogical status with excellent hemodynamic stabillity (blood pressure and puls oscillation less 20%) (Figure 1).

Anesthetic potential or effectiveness was sufficient noted as VAS 1–2 (Figure 2), except during the surgical approach within the perivascular sheeth percieved as VAS 3–6 (Figure 3) moderate pain. At this point the surgeon additionaly infiltrated with 2–3 ml 2% lidocaine and 50mg meperidine was given i.v. (Figure 4)

Postoperatively patients were admitted in the ICU, and no one patient needed no postoperative analgesics during the next 8 hours (VAS 0 in 100%). Further excellent hemodinamic stability and no deterioration in neurogical status were observed. One patient after carotid artery clamping developed neurological deterioration and was excluded from the study.

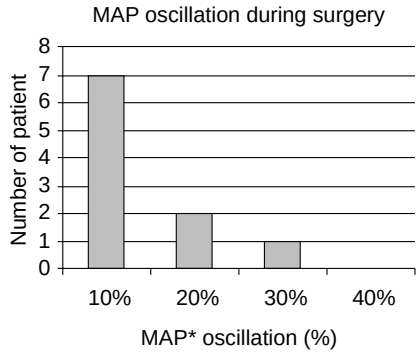

Figure 1. *MAP oscillation during surgery *MAP – median arterial pressure.*

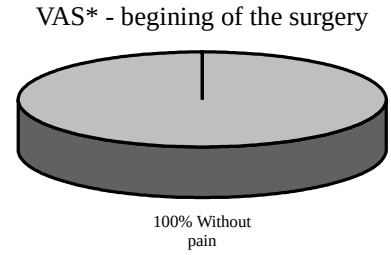

Figure 2. **VAS – visual analog scale.*

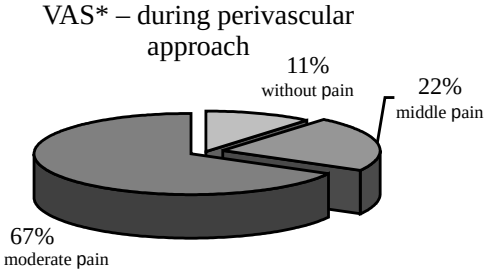

Figure 3. *VAS – visual analog scale.*

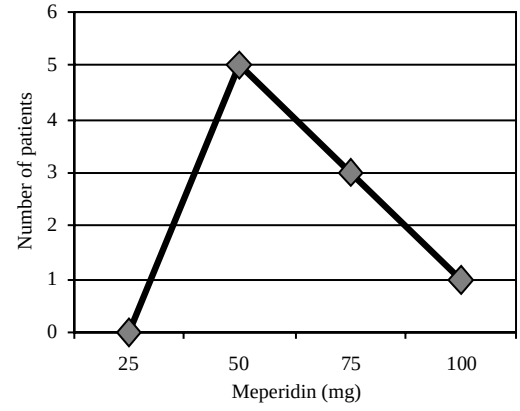

Figure 4. *Suplemental Meperidin during surgery*

DISCUSSION

As was mentioned before, carotid artery occlusion is a disease of the elderly population and anesthesia and perioperative preparations are related to many geriatric problems such as: biological age and concommitant chronic diseases *(1, 2)*. On the another hand, surgery and carotid artery clamping puts patients under a remmarkable risk

for cerebral ischemia developement *(3, 4)*. These are the reasons for dilema of anesthesia choice – what kind of anesthesia to perform?

General anesthesia which is easier to perform and doesen?t recquire special skills, is more comfortable for patients. It also enables the opportunity for better airway control, provides neuro/cardioprocetive influences using i.v. and inhalational anestethics, but without the ability to perform adequate neurological monitoring *(9)*.

Regional anesthesia on the other hand requires anesthesiological skill and good patient cooperation *(10, 11)*. The question which is most asked by patients during perioperative preparations is : »Is it painfull?». So, within our small study we tried to answer this question.

The answer is that regional anesthesia, using superficial cervical blocks which were performed, as before explained, is the method of anesthesia choice which preserves excellent hemodinamic status without dangeorous oscillations. During potent anesthesia, surgery (except for the moment of perivascular approach where additonal small doses of local anesthetic are needed) and excellent postoperative analgesia are provided.

Patient cooperation was good and satisfaction at the end of the surgery was achieved. We hope that our experiences will promote regional anesthesia not only in our hospital but also elsewhere.

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Short paper

Combined use of supraclavicular brachial plexus block and femoral nerve block for elective upper-extremity surgery requiring large skin graft

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Peripheral nerve block anesthesia provides excellent anesthesia and postoperative pain relief, fewer side effects than general anesthesia and facilitates early physical activity. The benefits of lower overall healthcare costs, reduced nursing interventions and facilitated next-day discharge are significant.

Supraclavicular brachial plexus (SCBP) block and femoral nerve (FN) block are blocks associated with mild patient discomfort.

The FN block provides complete anesthesia of the anteromedial thigh, anterior knee and medial calf, while SCBP block is most appropriate for forearm and upper arm surgery *(1)*.

We believe that combining an FN block and SCBP block is a clinically useful and effective technique for procedures requiring large skin grafts for the reconstruction of the upper extremity, providing excellent analgesia over a limited field without higher incidence of complications.

Case report

The patient was a 55-yr-old, 99-kg, 160-cm female. Her medical history was significant for hypertension, diabetes mellitus and asthma bronchale.

She underwent major skin reconstruction after dermatofibrosarcoma protuberans, a rare low-grade sarcoma of the skin, of the left humerus. Treatment has traditionally been wide excision with a 2- to 3-cm gross margin and reconstruction with skin graft.

She was evaluated as ASA physical status III. Her coagulation, hematology and routine biochemical profiles were normal. We have obtaining informed patient consent. She was informed with the principal benefits of regional anesthesia, improved pain control and reduced incidence of nausea and vomiting in the postoperative period. She was also informed with the duration of the blockade, the necessity for analgesic therapy as the block is wearing off, and the care of the insensate extremity.

The patient was premedicated with LMWH (Clexane) 0,4 ml sc. at 8 pm day before the surgery and with 7,5 mg of midazolam orally in the morning and she was in meaningful contact, awake and conversant during the performance of the blocks. On arrival to the operating room standard monitoring was established (pulse oximetry, electrocardiography, and noninvasive arterial blood pressure monitoring). Blood pressure was 138/85 mmHg, heart rate was 92 beats/min. Room air oxygen saturation measured by pulse oximetry was 98%. An 18-gauge intravenous catheter was placed in the dorsum of her right hand.

FN block and SCBP block were performed with the aid of a nerve stimulator and multiple stimulations technique in combination with ultrasound guidance.

We successfully located nervus femoralis and brachial plexus and it was easier with ultrasound to maintain the needle in the optimal position while the injection of local anesthetic was carried out.

Same solutions were injected, bupivacaine 0,375% (20 ml) for FN and for SCBP block (20 ml). Anesthetics were injected slowly in 5-ml increments with gentle aspiration between doses. At no time was any blood aspirated, nor she reported pain or paresthesias.After performance of the blocks, sensory (touch, pain, warm, cold) blockade of left hand and of femoral nerve distribution area, and motor blockade were recorded at 5, 10, 15, 20, 25 and 30 min.

Pain scores were recorded on a 10-cm linear visual analog scale with 0 cm corresponding to no pain and 10 cm to the worst imaginable pain. Sensory blockade was assessed by pinprick and compared with the same stimulation on the contralateral arm. Motor block was evaluated as complete (absence of mobility) or incomplete (minor movements possible).

Complete paralysis of left hand and complete sensory block (without possibility to identify touch, pain, cold or warm) was recorded after 20 min, and VAS score was 0.

There were no systemic or neurological side effects attributed to the local anesthetic drugs.

During the surgery oxygen was delivered via a Venturi facemask at a rate of 3 l/min.

No further supplemental sedation were administered intraoperatively. Patient was stabile during the surgery without any discernible difference in heart rate or blood pressure.

The duration of sensory and motor blocks were considered as the time interval between the administration of the local anesthetic and the first postoperative pain and complete recovery of motor functions.

Motor function returned to normal between 5–6 h for forearm after injection of the local anesthetic and onset of postoperative pain was prolonged for 12 hours after performance of blocks (first analgesics).

DISCUSSION

General anesthesia is often used instead of regional anesthesia when reconstruction of the upper-extremity skin lesions requires large areas of skin grafts. Peripheral nerve blocks as an alternative, provide excellent analgesia and surgical anesthesia over the limited field. Regional anesthesia and analgesia can help to improve respiratory function and mental status and patient comfort secondary to its opioid-sparing effects *(2)*.

Critically evaluating the potential benefits and supporting evidence is essential to appropriate technique selection. The block should have residual analgesia in the post-operative period, minimizing the need for systemic analgesics.

Despite these benefits, issues as additional time for block performance and delayed onset time may be reasons that regional anesthesia is under-used.

Franco and Vieira documented safety in a series of 1001 supraclavicular blocks performed by both consultants and residents *(3)*. No clinical pneumothorax or major complications occurred and the success rate was 97,2%.

The femoral nerve block is the most common lower extremity single injection block *(4)*. FN block is easy and reliable, it requires a low dose of the local anesthetic drugs, there is prolonged anesthesia at the donor site, it can be also repeated after surgery and it may be combined with other peripheral nerve blocks.

Ultrasound guidance *(5, 6)* in combination with electric nerve stimulation *(7)* might increase the success rate and help to avoid potentional complications. This improvement in the quality of nerve blocks includes reduction in the dose of local anesthetic *(8, 9),* a faster sensory and motor onset time, a longer duration and the avoidance of side effects like intraneural and intravascular injection *(10)*. Ultrasound imaging allows control, even in difficult cases and in situations with variations of normal anatomy.

Williams *et al. (11)* demonstrated that supraclavicular blocks with ultrasonographic guidance were accomplished faster than with nerve stimulation (5 vs. 10 min.).

In recent literature is still debate on which local anesthetic is more effective and safer.

Increasing the duration of local anesthetic action is often desirable because it prolongs surgical anesthesia and analgesia. The long duration of sensory block illustrates the benefit of bupivacaine *(12)* and its enantiomers in providing prolonged postoperative analgesia.

Regional anesthesia is particularly desirable and effective in elderly and high-risk patients undergoing a wide variety of surgical procedures.

We believe that combining an FN and SCBP block is clinically useful and effective technique providing efficient anesthesia for reconstruction of the upper-extremity skin lesions requires large areas of skin grafts and for prolonged post-operative analgesia. We hope that this successful case report will promote as regional anesthetic techniques as routine use of ultrasound guidance.

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Short paper

The bi-block technique – axillary block with unilateral spinal anaesthesia and axilary block with spinal anaesthesia

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This case report presents the BiBlock regional technique. We compare the simoultaneuous application of axillary block and spinal anaesthesia and axillary block and unilateral spinal anaesthesia. The patients are ASA II and ASA III wih chronic pulmonar obstructive disease and cardiovascular disease. The regional anaesthesia offers optimal surgical conditions with minimal haemodinamic changes and respiratory dearrangements. Considered the advanteges and the disandvantages of regional anaesthesia the BiBlock augments the possibilities of applications of regional nerve blocks. The use of the peripheral nerve stimulator simultaneuously with the ultrasound for the identification of the peripheral nerves diminishes the failure rate and the possibility of nerve injury or blood vessel puncture. The direct vision of the spread of the local anaesthetic solution augments the quality of the block and permits the use of diminished concentrations of the local anaesthetic.

Key words: BiBlock, axillary block, spinal anaesthesia

Case 1

Male, 57 years old, 80 kg, COPD, Hypertension, ASA III
Diagnosis: Refractura condyli lateralis femoris sin., St. post fracturam humeri l.sin et osteosinthesis sec AO
Surgery: Reosteosinthesis femoris sin. sec AO;
Spongioplastica
Extractio allenthesis humeri lat. sin.
Anaesthesia: Axillary nerve block + Spinal anaesthesia L3/L4 + oxygen 2 l/min
Local Anaesthetic: Chirocaine 0,375% 20 ml – axillary block
Chirocaine 0,5% 2ml – subarachnoid block
Sedation: midazolam 2,5mg i.v
Haemodinamic parameters: arterial blood pressure between 130/80 and 120/70, heart rate 75 – 85/minute
Fluid infusion: Cristalloids 1500 ml, 6% HAES 500 ml, Red blood cells concentrate 580 ml.
Lenghth of the surgery: 115 minutes
Length of the analgesia: 10 hours

Case 2

Male, 57 years old, 90 kg, Hypertension, ASA II
Diagnosis: Pseudoarthrosis antebrachii l. dex
Surgery: Osteosinthesis sec. AO

Anaesthesia: Axillary nerve block + Unilateral spinal anaesthesia L3/L4 + oxygen 5 l/min
Local Anaesthetic: Chirocaine 0,375% 30 ml – axillary block
Hyperbaric Bupivacaine 0,5% 1 ml – unilateral spinal block
Sedation: diazepam 5mg
Haemodinamic parameters: arterial blood pressure between 150/80 and 130/70, heart rate 75 – 85/minute, two episodes of 180/90 but without pain sensations
Fluid infusion: Cristalloids 2000 ml
Lenghth of the surgery: 165 minutes; length of the analgesia: 8 hours

RESULTS

In these cases the quality of the intraoperative and postoperative analgesia and the haemodynamic stablity is similar. The patient comfort and recovery time from anaesthesia is better in the case of unilateral spinal / axillary block compared to the spinal/axillary block. A randomised prospective study should be performed for optimal conclusions.

DISCUSSION

The regional anaesthesia techniques continue to evolve and with the peripheral nerve blocks we can selectively anaesthetise the desired part of the body for the surgical procedure. The problem often rises when there is the need to anesthetise two different regions of the body. The possibility of the BiBlock tecnique offers a wider spectrum of regional anaesthesia techniques for the surgical procedures. The regional techniques seem to be safer when compared to the general anaesthesia but the possibility of serious complications still exist and the caution is of fundamental importance *(1, 7)*. The spectrum of the complicatins varies from transient to life treathening. There are some data suggesting that the lipid infusions may help in the resuscitation of the patients with cardiac arrest *(8, 9)*.

The surgical procedures of the shoulder and arm are painful and the regional techniques offer good intraoperative and postoperative analgesia, reduced stress response, increased perfusion due to sympathectomy, earlier discharge for outpatients. There is still a debate about the ideal technique for the application of the peripheral nerve blocks *(2, 3)*. The use of the ultrasound for the guidance of the needle and the use of the peripheral nerve stimulator increase the effectiveness and the success rate of nerve block while minimising the complications *(4, 5, 6)*. The benefits are also the decreased dose of the local anaesthetic, faster onset and improved quality of the block. Regional anaesthesia offers also good postoperative analgesia for several hours.

There is still a debate of the safety and effectvenes of the local anaesthetics *(7, 8, 9)*. In our practice we use the levobupivacaine which offers better haemodinamic stability and less toxicity compared to bupivacaine.

We believe that the use of combined regional techniques is clincally useful, safe and effective and the spectrum of possible applications rises with the use of the ultrasound and peripheral nerve stimulation. The decreased concentrations of local anaesthetics used when the ultrasound thechnique is used permits the application to several nerve blocks. The informed consent, the comfort of the patient and the collaboration during the surgery are fundamental *(11)*. The selective spinal anaesthesia offers less frequent side effects compared to general anaesthesia and same or shorter recovery times *(12)*. The doses of local anaesthetic are reduced but with optimal analgesia in the surgical field *(13)* but with sill existing debate about haemodynamic stability despite optimal fluid preload(14). The possibility for addition of other pharmaceutical agents widens the quality of the sensory block. The currently used additives are: ketamine *(15),* magnesium *(16),* sodiumbicarbonate *(17),* clonidine *(17),* tramadol *(18),* sufentani *(19),* neostigmine *(20)* but the field is still controversial.

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Short paper

Combined use of interscalene brachial plexus block and supraclavicular block for shoulder surgery

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The lower overall healthcare costs and improved patient outcome are benefits of peripheral nerve block anesthesia. It provides excellent anesthesia and postoperative pain relief, fewer side effects than general anesthesia and facilitates early physical activity.

Interscalene block and supraclavicular block are blocks associated with mild patient discomfort.

Interscalene brachial plexus block provides complete anesthesia of the shoulder joint, and supraclavicular block is most appropriate for forearm and upper arm surgery *(1)*.

We believe that combining an interscalene and supraclaviculare block is clinically useful and effective technique for major shoulder surgery providing excellent analgesia over a limited field without higher incidence of complications.

Case report

The patient was a 49-yr-old, 80-kg, 170-cm male. His medical history was significant for depression and epilepsy, PTSD, and he was taking 2 x 200 mg of Phenytoin daily. His medical history was also significant for periodical SVES.

He underwent major left shoulder reconstruction after complicated fracture of the humerus. He was evaluated as ASA physical status III. His coagulation, hematology and routine biochemical profiles were normal. We have obtaining informed patient consent. He was informed with the principal benefits of regional anesthesia, improved pain control and reduced incidence of nausea and vomiting in the postoperative period. He was also informed with the duration of the blockade, the necessity for analgesic therapy as the block is wearing off, and the care of the insensate extremity.

The patient was premedicated with 5 mg of diazepam p.o. and he was in meaningful contact, awake and conversant during the performance of the blocks. On arrival to the operating room standard monitoring was established (pulse oximetry, electrocardiography, and noninvasive arterial blood pressure monitoring). Blood pressure was 120/80 mmHg, heart rate was 80 beats/min. Room air oxygen saturation measured by pulse oximetry was 97%. An 18-gauge intravenous catheter was placed in the dorsum of his right hand.

Interscalene brachial plexus block and supraclavicular block were performed with the aid of a nerve stimulator and multiple stimulations technique in combination with ultrasound guidance. We successfully located brachial plexus and it was easier with ultrasound to maintain the needle in the optimal position while the injection of local anesthetic was carried out (Figure 1).

Different solutions were injected, the admixture of levobupivacaine 0,5% (20 ml) with 25 mg (1 ml) of ketamine for interscalene block and levobupivacaine 0,375% (15 ml) for supraclavicular block. Anesthetics were injected slowly in 5-ml increments with gentle aspiration between doses. At no time was any blood aspirated, nor he reported pain or paresthesias.

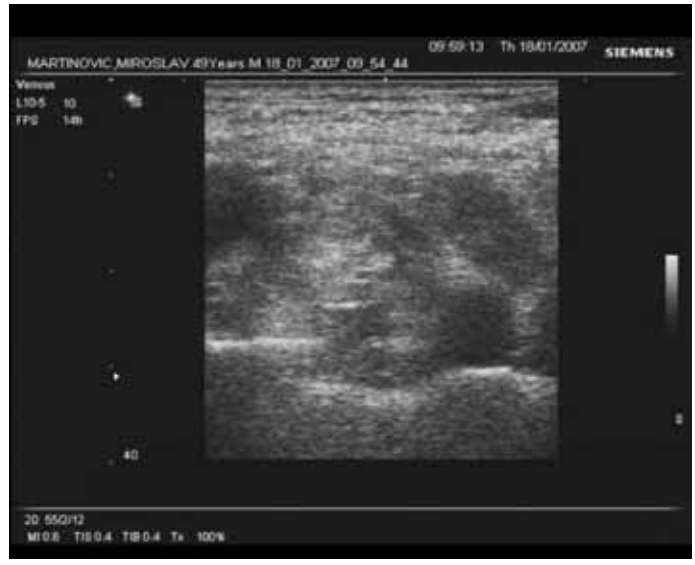

Figure 1.

After performance of the blocks, sensory (touch, pain, warm, cold) and motor blockade of left hand were recorded at 5, 10, 15, 20, 25 and 30 min.

Pain scores were recorded on a 10-cm linear visual analog scale with 0 cm corresponding to no pain and 10 cm to the worst imaginable pain. Sensory blockade was assessed by pinprick and compared with the same stimulation on the contralateral arm. Motor block was evaluated as complete (absence of mobility) or incomplete (minor movements possible). Complete paralysis of left hand and complete sensory block (without possibility to identify touch, pain, cold or warm) was recorded after 20 min, and VAS score was 0.

There were no systemic or neurological side effects attributed to the local anesthetic drugs. During the surgery oxygen was delivered via a Venturi facemask at a rate of 3 l/min. No further supplemental sedation were administered intraoperatively.

Patient was stabile during the surgery without any discernible difference in heart rate or blood pressure. The duration of sensory and motor blocks were considered as the time interval between the administration of the local anesthetic and the first postoperative pain and complete recovery of motor functions. Motor function returned to normal between 10 and 11 h after injection of the local anesthetic and onset of postoperative pain was prolonged for 32 hours after performance of blocks (first analgesics).

DISCUSSION

Major shoulder surgery can be extremely painful. Peripheral nerve blocks provide excellent analgesia over a limited field and with minimal systemic effects.

The block should have residual analgesia in the post-operative period, minimizing the need for systemic analgesics. Regional anesthesia and analgesia can help to improve respiratory function and mental status and patient comfort secondary to its opioid-sparing effects *(2)*.

Interscalene block has proven safe and effective for shoulder surgery when performed in awake patients *(3),* also it provides excellent anesthesia and effective postoperative analgesia *(4)*.

Ultrasound guidance *(5, 6)* in combination with electric nerve stimulation *(7)* might increase the success rate and help to avoid potentional complications. This improvement in the quality of nerve blocks includes reduction in the dose of local anesthetic, a faster sensory and motor onset time, a longer duration and the avoidance of side effects like intraneural and intravascular injection.

In recent literature is still debate on which local anesthetic is more effective and safer. And there is also debate on the advantages of bupivacaine's left isomer, levobupivacaine. A double- blind comparison of equal doses of levobupivacaine and bupivacaine for supraclavicular brachial plexus block found almost no difference in clinical block profile *(8)*. There was slightly longer duration of sensory block with levobupivacaine, but the difference was not statistical significant. Potentional advantage lies in its potentional safety when large doses are required.

Increasing the duration of local anesthetic action is often desirable because it prolongs surgical anesthesia and analgesia.

Different additives have been used to prolong regional blockade *(9)*. Clonidine increases the duration of anesthesia and analgesia when mixed with local anesthetics used for brachial plexus blockade *(10, 11)*. Addition of 100 mg of tramadol to 1% mepivacaine for axillary brachial plexus block results in a significant increase in duration of blockade without any side effects *(12)*. One study using neostigmine has shown analgesic benefit *(13)*.

Although there is no evidence in recent literature about ketamine, our experience confirm that ketamine added to levobupivacaine for interscalene block prolongs the duration of blockade, and it affects on the quality and onset of blockade.

In our case, the admixture of levobupivacaine 0,5% (20 ml) with 25 mg (1 ml) of ketamine for interscalene block and for supraclavicular block levobupivacaine 0,375% (15 ml) provides faster onset (20 min. for complete block) a pronounced prolongation of blockade (32 hours) without anÏ discernible difference in heart rate or blood pressure and without adverse effects.

We believe that combining an interscalene and supraclaviculare block is clinically useful and effective technique for complicated shoulder surgery providing more efficient anesthesia and post-operative analgesia.

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ABSTRACTS

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Abstract

Selective spinal anaesthesia improves the early recovery profile of patients undergoing gynecologic surgery

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Abstract

Backgound and purpose: This study assess the feasibility of performing the vaginal hysterectomy, the conisation and the tension-free vaginal tape operation under spinal anaesthesia. We tested the hypothesis that 0,05mg per cm high of local anesthetic levobupivacaine is enough to achive efective spinal block.

Materials and methods: 36 patients were allocated in 2 groups (mean age 62,ASA II, III). For the tension-free vaginal tape operation (TVT) and conisation 18 patients recieved saddle block,and for vaginal hysterectomy the others 18 had classical spinal block.Premedication, haemodynamic monitoring, intraoperative fluid rehidration,the use of vasoactive drugs was standardized. According to the patient high spinal anesthesia was realised with intrathecal injection of: 0,5% levobupivacaine (0,05mg*cm high) +25mcg Fentanyl+1,5ml 10% glucosae,through the Whitacre needle at the L3-L4 interspace. The degree of the spinal block was assessed by pin prick and Bromage motor score.

Results: All the ASA groups of patients tolerated the procedure well,and all blocks were adequate for surgery. Mean time for achieve saddle block was 16,9 min. with the mean dose of 4,5 mg 0.5% levobupivacaine,and for the classic spinal block it was 14,4 min. with the mean dose of 9,1 mg 0,5% levobupivacaine. Duration of the anesthesia was longer in the classic spinal group (85 min v.45 min) because the vaginal hysterectomy is more extensive procedure.The decrease of MAP and of HR from the baseline was less marked in the saddle spinal group (MAP 14,7% v. 23,4%; HR 11% v. 23%).The recovery from spinal anesthesia,for the walk out was early achieved in the saddle group.Pruritus,although brief and mild was the primary side effect.

Conclusions: The advantage of selective spinal anesthesia in gynecologic surgery include minimal influence with homeaostasis and rapid recovery.

Key words: spinal anaesthesia, saddle block, levobupivacain, fentanyl, vaginal hysterectomy, conisation, tension-free vaginal tape operation, early recovery

Introduction

Genuine stress urinary incontinence, vaginal prolapse,myomathosis of uterus appear to be commonly related to aging, obstetric trauma, and chronic increases in intraabdominal pressure. These conditions are most often seen in eldery women, many times concomitantly. These patients often have many other diseases in addition to general deterioration of their health, putting them at risk for surgical correction.Surgery for severe uterine and vaginal patology was traditionally performed under general anesthesia,wich can lead to complications, especially in the eldery and physiologically fragile. Risks of general anesthesia in the eldery include intraoperative cardiovascular compromise as well as postoperative atelectasis, pneumonia,stroke,and cognitive changes.

Rational approach to these patient suggest that spinal anesthesia may be advantageous, especially if we can control the degree of the spinal blockade.This study aimed at evaluating the possibility that the doses of 0,05mg per cm high of local anesthetic levobupivacaine with fentanyl in hyperbaric solution can be enough to achive effective spinal block. Such an approach should, theoretically, reduce cardiovascular complications, the amount of the infusion volumen used, fast blockade recovery and therefore bring faster recovery of patients.

Materials and Methods

The study included 36 patients after their informed consent was obtained. The patients were mean age 62 y., American Society of Anaesthesiologyst (ASA) grade I-II-III, scheduled for an elective gynecologic surgery were assigned to one of two groups: group1. for vaginal hysterectomy who received classical spinal mild–thoracic block, and the group 2. for the conisation and the TVT operation who received saddle spinal block (Table 1.)

TABLE 1

Demographic data of patients in the study.

Type of block	Saddle spinal block	Classic spinal block
No.of patients	18	18
Mean Age (years)	52,9 (+/– 14)	62,1 (+/– 9)
Mean body high (cm.)	166,3 (+/–6)	164,5 (+/– 3)
BMI	27,44 (+/–5,87)	26,90 (+/–5,99)
ASA groups	II – 10	II – 6
	III – 8	III – 12
Type of surgery	Conisatio – 9	Hysterectomia vagynalis – 18
	TVT – 9	

BMI – body mass index

Patients with hyperthension, local skin infections, or those receiving anticoagulant therapies were excluded from the study. Patients fasted 8hrs preoperatively and received 500ml of lactated Ringer's solution (i.v.), and midazolam (7.5mg orally) for premedication.

The anesthesia was induced as follows: on arrival in the anesthesia induction room, a peripheral i.v. access was established using an 18-gauge cannula and 150 mL of Ringer lactate was infused for approximately 10 min. Blood pressure, pulse and saturation were monitored from this moment on till the patient was taken away from the operation theatre. After the sterile preparation and draping, the puncture was performed in sitting position with a 25/27 gauge Whitacare spinal needle at the L2-L3/L3-L4 interspaces via middle approach without the barbotage. Once free flow of CSF was recognized we injected:

- classical spinal block (group1.): 0,05 mg per cm high of 0,5% levobupivacaine +20–35mcg of fentanyl + 1,5ml10% glucosae; the patient was then immediately placed in the supine lithotomy position
- saddle spinal block (group2.): 0,025mg per cm height of 0.5% levobupivacaine + 15–25mcg of fentanyl+ 1,5ml 10% glucosae; the patient remaining in the same posture for about 15 min, then after achieving a block and checking its level the patient was placed in supine lithotomy position.

In both groups we recorded the changes in the pulse and blood pressure, the amount of infusion solutions to maintain normal circulatory parameters, determined the degree of sensory and motor block by Bromage and pin prick scale, time for regression of the motor functions and the sensitivity of lower limbs. The patients were monitored for possible early adverse postoperative side effects such as headache, urine retention, and orthostatics.

Results

All the 36 patients had successful completion of surgery without general anesthesia,and all the blocks (Bromage and pin prick score) were adeguate for the surgery.

When comparing groups1 vs. 2, those patients undergoing vaginal hysterectomy during spinal anesthesia were significantly older than those who had the surgery performed during the saddle block (age 63+/–9,6yr vs. 53 +/–14yr; $P<0,0001$) During the tension-free vaginal tape operation (TVT) all the patients' were able to perform intraoperative cough test which help to correctly position the tape.

The latency time for achive anesthesia was shorter in the classic spinal group 1. (14,4+/–3,9min vs. 16,9 +/–4,6min.; $P<0,0001$), but the haemodinamics changes in MAP and HR it were more pronunciated than in the saddle group2. During the operation time the decrease in MAP was 23,4% and in HR was 23% for the classic spinal group1.,so the volume of

intravenous fluid administered was greater that in the group 2.(1115,4 +/– 416ml vs. 1000 +/– 365ml),like the use of sympathomimetic therapy.

Our results indicate that the degree of haemodinamics changes is directly proportionated to the quantity of local anesthetics in mg that we use for inducing of the spinal block. Table 2. shows anesthesia data.

Table 2

Anesthesia related results.

Group	Saddle spinal block	Classic spinal block
Duration of anesthesia (min)	45,3 (+/–22)	85 (+/– 21)
Mean time to achieve the block (min)	16,9 (+/– 4,6)	14,4 (+/– 3,9)
Levobupivacaine mean dose (mg)	4,5 (+/– 0,7)	9,1 (+/–0,8)
Fentanyl mean dose (mcg)	20,7 (+/–5,3)	28,5 (+/–9)
MAP at start (mmHg)	115,6 (+/–12,3)	123,9 (+/– 10,5)
MAP lowest during anesth.time (mmHg)	98,6 (+/–13,4)	94,8 (+/– 12)
Heart rate (intraoperative decrease in %)	11%	23%
Ephedrine-hypothension (No. of patients)	3	5
Atropine-bradicardia (No. of patients)	2	3
Infusions volumen (ml)	1000 (+/– 365)	1115,4 (+/– 416)

There was no difference between the 2 groups in the success rate of the operation, the patients' global satisfaction index, and the preferred anesthesia for the future operation by the surgeons. None of the patients reguired additional or rescue medication. Table 3. shows side effects and post anesthesia results.

Table 3

Side effects and post anesthesia results:

	Saddle spinal block	Classic spinal block
Pruritus	5	7
Foley catheter (No of. patients)	1 (1 time)	All for one week time
Post op. Voiding (hours)	3,6	?
PONV / PPHD	0 / 1	1 / 1

Conclusions

In attempting to define the adeguate dose of local anesthetic for spinal anesthesia we chose to study different kind of vaginal surgery.These operations were all elective and reguired no additional invasive monitoring.This allowed a pure comparison of anesthetic induction time and the comparison of overall perioperative time and medications used, wich may be related to the choice of anesthetic technique.We believe that our study can be generalized to other surgical procedurs which meet the same criteria. Our study is limited by the small numbers and relatively short follow-up; however,we believe that the resulst justify the conclusion that TVT, conisatio and vaginal hysterectomy can be completed safetly under spinal anesthesia with effective results even if we limiting the dose of local anesthetic levobupivacaine to 0,05mg per cm high of the patients'.

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Complications of peripheral nerve blocks and catheters: what to do?

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Abstract

Approximately 20% of all anesthetic procedures are performed by regional techniques in France. It is believed that regional techniques are more prone to induce nerve damage.

American Society of Anesthesiologists conducted a system analysis of nerve injury associated with anesthesia. An analyze of nerve injury claims derived from the closed files of 35 professional liability insurance companies entered into the database since an earlier 1990 showed that the majority of nerve injuries occurred after general anesthesia. The most common were death (32%), ulnar nerve damage (16%) and brain damage (12%).

In this article author presents a system of nerve injury classification ranging from a mild, reversible neuropraxia to a permanent sensorimotor deficit with respect to its function and potential recovery. A complete clinical examination performed by neurologist is mandatory to document the extent of the lesions. An evaluation of nerve damage may be performed by ultrasonography, MRI, electroneuromyography (ENMG), evoked sensory potential or electromyogram (EMG). In appropriate protocols nerve(s) stimulated, minimum current intensity, and impulse duration have to be registered. The presence or absence of pain during injection of the local anesthetic and the measures taken has to be written in the protocol. A complete documentation of the block will be extremely helpful in case of close claims.

The best treatment of neurological deficit after regional anesthesia is prevention. A careful technique and positioning of the awake patient with adequate padding should prevent any nerve damage. Once damage has occurred, the assistance of a trained neurophysiologist should be sought.

Introduction

Approximately 20% of all anesthetic procedures are performed by regional techniques in France consisting of 442'000 spinal, 275'500 peribulbar, 58'100 epidural, and 344'600 peripheral anesthesia blockades. It is believed that regional techniques are more prone to induce nerve damage since the aim of these techniques is to deposit the relatively high concentrations of the local anesthetic in the vicinity of the nerve. However, it is interesting to note that 60% of the claims for nerve damage occurred after general anesthesia, but more procedures in general are performed under general anesthesia *(2)*.

American Society of Anesthesiologists Closed Claims Database

A system analysis of nerve injury associate with anesthesia was conducted examination of the American Society of Anesthesiologists (ASA) Closed Claims Database *(2)*. This database is a standardized collection of case summaries derived from the closed claims files of 35 professional liability insurance companies. The authors analyzed nerve injury claims entered into the database since an earlier 1990 report to see whether previously unrecognized patterns of nerve injury could be identified that might suggest strategies for their prevention. The authors in this study also analyzed the entire database of 4'182 claims to provide an updated description of claims for nerve injuries and to assess liability trend as related to the date of the nerve injury occurred.

The results of this vast and important study showed that the major injuries in the 4'183 claims in the Closed Claims Project database were death (32%), nerve damage (16%) and brain damage (12%). Ulnar neuropathies were most frequent, followed by injuries to the brachial plexus, lumbosacral nerve root, and spinal cord. The injuries were bilateral in 14% of ulnar injuries and in 12% of brachial plexus injuries. Interestingly, men predominated in ulnar injury claims, and females

filed non-nerve damage claims predominantly. The incidence of ulnar and brachial plexus injuries were more frequently encountered with general anesthesia. On the contrary, lumbosacral nerve root and spinal cord damage were more frequently associated with regional anesthesia.

The authors looked for specific mechanisms to explain the occurrence of these adverse events. With the exception of spinal cord damage, the mechanism of injury was not evident in the file of most claims for nerve injury. However, a number of factors associated with many of the claims suggesting a possible mechanism of injury were present. In particular, ulnar nerve damage exhibited recurrent associated factors. In the cases of brachial plexus injuries, eight of 83 (10%) were clearly related to patient position, such as the use of shoulder braces and the head position, malposition of the arms, and sustained neck extension. Not surprisingly, care was estimated not to be adequate in all of these claims. Of the 13 brachial plexus injuries associated with a block, paresthesias were specifically noted in four axillary blocks. In two of these blocks, paresthesias occurred during injection of the local anesthetic. Two claims were related to sternal retraction during cardiac surgery.

Classification of nerve injury

The degree to which a nerve is damaged has implications with respect to its function and potential recovery. *Neurapraxia* describes a mild degree of neural insult that results in impulse conduction failure across the affected segment. It is reversible. The electromyogram (EMG) is unaltered, but electroneuromyography (ENMG) demonstrates a decrease in conduction velocities and/or an increase in latencies.

Axonotmesis occurs when only the axon is physically disrupted with preservation of the endoneurium and other supporting connective tissue structures. Recovery of function depends upon time for the process of Wallerian degeneration and neural regeneration to occur. The rate of regeneration varies from 1–3 mm per day. The recovery process is better if the patient is young and healthy, and the lesion is distal.

Neurotmesis is the highest degree of disruption a nerve can incur and is complete disruption of all supporting connective tissue structures. The nerve is completely severed and there is no continuity. This implies a very poor prognosis for complete functional recovery.

Which investigations and when?

As soon as a neurological deficit is suspected, a complete clinical examination is mandatory to document the extent of the lesions. In our institution, a neurologist is always asked to examine the patient.

If compression is suspected, ultrasonography or a magnetic resonance imaging (MRI) of the plexus has to be done. A test of the sympathetic functions is helpful and is rapidly performed in our institution. ENMG is done within the first days after the insult *(3, 4)*. If normal, it will be repeated 3–4 weeks later. At this time, if the ENMG is abnormal, it will be repeated after 6 months. If normal, the patient will be clinically observed.

Evoked sensory potential (ESP) will be performed immediately (within 1–3 days after the insult), especially if the first EMG is normal. If the ESP is abnormal, a check should be made 6 months later. If the ESP is then normal, the patient can be only clinically followed up.

How to document the block?

It is mandatory to have a complete documentation of the block. A protocol is necessary on which you can record which nerve(s) was stimulated, at which minimum current intensity, and with which impulse duration. The appearance of any pain or paresthesia during the procedure should be noted and the measures taken should be clearly explained. The presence or absence of pain during injection of the local anesthetic has to be written on the protocol. A complete documentation of the block will be extremely helpful in case of close claims.

The best treatment of neurological deficit after regional anesthesia is prevention. A careful and well-documented technique in an awake patient should prevent any nerve damage due to the needle or an intraneural injection. Awareness of the problems associated with operative positions and careful positioning of the patient with adequate padding belong to the appropriate precautions. Once damage has occurred, it can take several forms, ranging from a mild, reversible neurapraxia to a permanent sensorimotor deficit. The electroneurophysiological investigations provide useful diagnostic and prognostic information, and the assistance of a trained neurophysiologist should be sought in these cases.

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Abstract

Lower limb and scrotal oedema following knee arthroscopy with tourniquet in spinal anaesthesia

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Arthroscopy is a diagnostic and therapeutic surgical procedure and it is considered to be very safe *(1, 2, 3)*. Complication incidence is relatively low and it is represented in 0.15 % for anaestesiological and cardiological, 0.31 % for intraoperative and 6.34% for postoperative complications (1).The most common complications are: intraarticular damage, blood vessels lesions, compartment syndrome, neural lesions, arthroscopyc instrument rupture, haemarthrosis, synovitis, synovialis fistula, infection, thromboembolia and mild subcutaneous tissue oedemas *(2, 3)*. The risk of complications is higher due to demanding and long-term procedures *(3)*.

This is a case report of a patient who developed lower limb and large inguino-scrotal oedema following knee arthroscopy. The goal of this case report is to describe and worn at another possible complication due to long and demanding arthroscopic procedures.

Case Report

A 53-year old man was admitted for elective arthroscopy of his left knee due to ruptured lateral meniscus. Over the last few years, he has been under medical supervision because of elevated blood sugar and uric acid levels, but no therapy other than a diet was needed. Few years earlier he was subjected to general anaesthesia due to osteosynthesis of his right elbow, and spinal anaesthesia for inguinal hernia repair, without complications. He was ASA physical status II.

As premedication he received 3 mg of midazolam intravenously, 20 minutes before he was subjected to subarachnoid anaesthesia. After skin preparation with chlorhexidine, levobupivacaine 20 mg was injected after a single lumbar puncture at L3-L4 interspace with 25 G needle. Tourniquet was applied 10 minutes later with pressure of 350 mmHg.The patient was in supine position with leg put into the knee holder. Irrigation fluid used for this procedure was 0.9 % NaCl with manually controlled pump. Complete rupture of lateral discoid meniscus was found and complete meniscectomy was done with standard arthroscopic instruments. This is successful but more demanding procedure than routine menisceal excisions. Considering the procedure lasted for two hours about 26 liters of irrigation fluid was used to achieve visualisation during the operation.

Non-invasive blood pressure (NIBP), heart rate (HR) and saturimetry (SpO2) were measured during the procedure. Patient's systolic blood pressure was between 100 mmHg and 140 mmHg, heart rate between 50 b./minute and 70 b/minute and haemoglobin saturation between 94 and 100%. Near the end of the procedure the patient became impatient, nervous and restless, so he received 5 mg of midazolam intravenously.

Following the tourniquet removal, subcutaneous oedema of the left and right femoral, lower abdominal and inguinoscrotal region appeared. Scrotal oedema was the most impressive and was five to six times larger than normal scrotum size.

Antioedematous therapy including manitol 20 g and furosemid 10 mg was immediately administered. Urinary catheter was inserted and patient was constantly monitored for the next seven days in postoperative recovery room.

His electrolyte status was checked every day and NIBP was measured hourly as well as the urine output.

About five hours after surgery BP was 180/120 mmHg, so 10 mg of nifedipine was administered. During the next five days BP varied from 130/80 mmHg to 170/100 mmHg. On the 7th day following surgery BP stabilised to 120/70 mmHg.

Diuresis was stimulated with manitol 80 g/day and furosemid 30–40 mg/day so urine output in the first 12 hours was 7400 mL, (100mL as the lowest and 1000 mL as the highest value per hour). For the next 12 hours urine output was 2210 mL, on the 2nd day 4950 mL, on the 3rd day 4200 mL, on the 4th day 4500 mL, on the 5th day 2700 mL. Subseqently there was no fluid input. Urinary catheter was removed on the 6th day, as well as the antioedematous therapy, but diuresis was being monitored closely during the following days.

Electrolyte status in the first 24 hours was: sodium 142 mmol/L, potassium 3.5 mmol/L, chloride 113 mmol/L and calcium 1.72 mmol/L. Plasma osmolality was 305 mmol/L. For the next few days electrolyte status was normal, except lower potassium levels (between 3.2 mmoL and 3.7 mmoL), so 500 mg of potassium chloride per os was administered on the 3.rd day following surgery, 3 times daily for 5 days. Routine thromboprofilactic therapy with enoxaparine 20 mg was included. During the following days oedema gradually withdrew. Fourteen days after the surgery the patient was discarged from the hospital, fully recovered.

Discussion

Complications during knee arthroscopy are more common in long-term and complicated procedures *(4)*. Arthroscopic visualization revealed a discoid meniscus which is an anatomic variation that usually affects the lateral meniscus. Sometimes medial or both sides of the same knee can be affected. The incidence is 0.1– 0.3 % *(4)* in arthroscopic findings. Asian population has higher rate up to 16.6 % *(5)*.

This TURP (6) -like Syndrome due to knee arthroscopy is a very unusual complication and hasn't been reported yet.

Regional (spinal) anaesthesia is a safe alternative for the most of lower limb orthopaedic procedures, including arthroscopy.The possibility of the verbal contact with patient presents an additional monitoring which can, soon enough, point to some unwanted events considering anaesthesia and operation.Near the end of the surgery our patient began to complain about backache and general discomfort. Calm and satisfied until then, he suddenly became impatient and non-colaborative.We suppose that the cause of his discomfort was a slow development of the inguino-scrotal oedema. Almoust certainly we can exclude the possibility of system toxic reaction due to subarachnoid injection of 20 mg levobupivacaine.

Haemodynamic stability of the patient during the procedure did not point to possible volume overload. Sistolic arterial pressure varied from 100 mmHg to 130 mmHg, and puls from 50 b./minute to 70 b./minute.

There was no respiratory dysfunction, as well. Haemoglobin oxygen saturation was normal during the surgery for the whole time (95–100 %), even higher as the surgery was coming to its end.

During the postoperative period there was no significant electrolyte misbalance besides lower potassium levels (3.2 mmol/L do 3.7 mmol/L) due to induced abundant diuresis. This is expected electrolyte status, because isotonic fluid was used for irrigation. Both systolic and diastolic arterial pressure values were elevated postoperatively, supposing due to hypervolaemia.

Fluid restriction, antiedematous and supportive therapy with intensive monitoring, led to complete recovery of this patient.

Conclusion

We can repeat the well known fact, that in medicine, especially due to surgical procedures, there is no intervention that doesn't carry any risk. Although arthroscopy is being considered as a low risk procedure, it can be followed by numerous and potentially dangerous complications. The fact that the patient was subjected to a minor surgical procedure (knee arthroscopy) and to a very safe anaestesiological technique (spinal anaesthesia) does not exclude the need of constant presence and monitoring of the patient by the anaestesiological team during the perioperative period.

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Abstract

Pleural analgesia

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Current approach to treatment of thoracic wall injuries is to try to primary treat these injuries conservatively. The treatment of thoracic wall injuries includes:

1) analgesia (regional block + nonsteroidal anti-infammatory drug)

2) arteficial ventilation in regard to extent of lung injury (ABS)

3) surgical treatment (exceptionally in contex of thoracotomy)

The basis of conservative treatment of thoracic wall injuries is analgesia, epidural analgesia for bilateral and pleural analgesia for unilateral fractures of more than 3 ribs.

Pleural analgesia

Pleural analgesia is a method of regional analgesia which implies intrapleural application of local anesthetic in order to achieve blockade of somatic dermatomes of intercostal nerves, sympathetic ganglia and partially splanchnic nerves. Pleural catheter is introduced behind posterior axillary line, always between the line of injury and spine.

Pleural analgesia is an ideal method for treatment of unilateral thoracic wall injuries and for treatment of unilateral rib fractures combined with injury of upper abdomen, particulary injury of pancreas.. Pleural analgesia has nowdays suppressed individual intercostal nerve blockades. Specially designed catheter with double valvular system is used, which enables drainage of smaller amounts of blood and effusion. It can also be used for drainage in case of pneumothorax or to prevent its appearance in trauma patients.. Use of pleural analgesia in patients with »flail chest« leads to improvement of their ventilation parameters. All local anesthetics were used for intrapleural application. Lidocain is due to its shorter action and low toxicity used for rapid acievement of analgesia and for anagesia in children. The most efficient local anesthetic for pleural analgesia is 0.125–0.5% bupivacain in volumes of 20–40 ml.

Methods

The effects of pleural analgesia with 0.125% bupivacaine were observed in a prospective study during 19 months in patients with dominant thoracic injury. Pleural analgesia was applied in patients who sccored more than 3 according to VAS after introduction of basic analgesia with nonsteroidal anti-infammatory drug. Pleural catheter by Matthys with double valvular system and with special valve for application of local anesthetic and another one for aspiration of pleural effusions, 2 mm in diameter (Pleuracan, BRAUN, Melsungen) was introduced intrapleuraly. Pleural analgesia was applied according to following criteria:

1) Unilateral serial fracture of more than 3 ribs with or without »flail chest«

2) Fractures of less than 3 ribs with intensive local pain and effusion

3) Fractures of lower ribs and injury of upper abdomen (injury of pancreas)

4) Bilateral fractures of few lower ribs with effusion

5) Bilateral fractures of ribs in patient with thrombocitopenia and coagulopaty (epidural analgesia was contraindicated)

6) In afteficialy ventilated and sedated patients with thoracic wall injuries before »weaning«

0.125% bupivacaine was used for pleural analgesia in volume of 20–40 ml. Total dose of local anesthetic was individualy adapted according to intensity of pain in VAS during first 24 hours. Diclofenac and metamisol were NSAID used for analgesia. Patient monitoring included continuous pulse oximetry SpO2 and arterial ABS. According to values of SpO2 and ABS arteficial ventilation was indicated (PaO2<8 kPa, PaCO2>7 kPa, SpO2<90%).

During 19 months 319 patients with thoracic trauma, age 47.06+18(16–82) yrs were admited in ICU of University Hospital of Traumatology. Out of total number of 319 patients, 164 patients had unilateral thoracic injury, 37 bilateral thoracic injury and 118 patients had thoracic injury as a part of severe trauma. Pleural analgesia was applied in 101 (61.6%)patients with unilateral thoracic injury, in 21 (56.7%) patients with bilateral thoracic injury and in 26 (22%) patients with severe trauma.

Analgesia (3 points or less according to VAS) was achieved in all patients within 8 minutes. Individualy adapted dose was 50–150 mg of bupivacaine during 24 hours, 1–3x40 ml respectively. Complications in terms of thoracic injuries were not noticed. In 7 (4.7%) patients catheter was misplaced.

Discussion

Pain and disorders of ventilation after severe injuries of thoracic wall, especially »flail chest« can last from several months to one year. Acute pain can be relieved with local blockade or with parenteral use of opioids. Opioids produce central depression of ventilation and cause gastrointestinal disfunction when applied in larger doses and for longer periods which leads to further deterioration of ventilation. The use of nonsteroidal anti-inflammatory drugs is not sufficient for acute pain treatment but their use is recommended after cessation of local blockade for several months.

With regard to its pharmacokinetic and pharmacodynamic properties bupivacaine is the most commonly used local anesthetic for intrapleural application. Complete analgesia is achieved within 8 minutes. With intrapleural application of very high doses of bupivacaine weakness of intercostal muscles was observed so reduction of bupivacaine dose or possibly application of ropivacaine is recommended. Our study showed that in order to achieve analgesia it is important apply local anesthetic in adequate total dose and volume. Minimal analgesic dose must be applied in volume sufficient to cover the fracture line of thoracic wall.

The questions like how long should catheter be left in pleural space and what are deficiencies in comparisson to standard thoracic drains are still under discussion. Small diameter (2mm) of pleural catheter prevents ascension of bacteria toward intrapleural space and the possibility to drain effusions also contributes to prevention of infection. Total amount of fresh blood in case of hematothorax can also be drained through pleural catheter and if necessary thoracic drain with the use of suction can be placed at the same time. The procedure of catheter placement is simple and there are practically no contraindications to its use (this method is also adapted for punction of pulmonal and pleural abscesses).

Conclusion

1. Pleural analgesia with bupivacaine is an excellent method of analgesia for unilateral and bilateral injuries of thoracic wall.
2. The application of pleural catheter by Mattys is very simple and there are practically no contraindicatios.

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Abstract

Spinal endoscopy and painful hardware syndrome

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Spinal hardware may be a pain generator in patients suffering from the failed back surgery syndrome. This report describes use of the spinal endoscopy to identify and examine content of the spinal canal. A case of 53 year old male patient suffering from the failed back surgery syndrome undergoing treatment and evaluation with spinal endoscopy and lysis of the adhesions is presented. Spinal hardware was identified as a pain generator using three dimensional approach with fluoroscopy and spinal endoscopy. Spinal endoscopy may be a valuable tool in identification of the pain generators in painful hardware syndrome.

Background

Spinal endoscopy is a recognized technique for evaluation and treatment of conditions of the spinal canal. The anatomy and pathology of the spinal canal has been described in detail using this technique *(1–5)*.

Spinal hardware is frequently implanted during the surgical treatment of intractable low back and leg pain, as well as during surgical correction of other spine conditions.

Pain often persists long after the spinal surgery; the literature quotes long-term pain in up to 60% of the patients whose original indication for surgery was back or leg pain *(6, 7)*. Historically, painful hardware syndrome has been a diagnosis of exclusion, reached after exhausting possible other causes of pain. Hardware injections involve the use of a needle therefore the procedure itself may induce pain.

This report describes use of the spinal endoscopy in the identification of the spinal hardware as a pain generator in a patient with failed back surgery.

Case report

The patient is 53 year old male with 10 year history of intractable back pain stemming from an original herniated disc injury. He tried extensive conservative therapy including physical therapy, muscle relaxants, anti-inflammatory medications, narcotics and numerous adjuvant medications including pregabalin without success. Subsequently, he had three spinal surgeries including discectomy, and laminectomy with spinal fusion twice using screws and plates and a spinal cage.

These extensive treatments and surgery did not improve his pain and he was ultimately diagnosed with failed back surgery syndrome. He has remained on narcotic and other medications with persistent severe pain that he rated constantly between 9 and 10 on the numeric scale of 0–10. His uncontrolled back pain has prevented him from working and required numerous hospitalizations and emergency room visits; he reported his pain interfered significantly with his quality of life.

Eventually, the patient developed burning, neuropathic type pain in the lower back region and radiating into sacrococcygeal area and genitals. He presented to the pain management clinic at this point, using multiple medications as mentioned above with minimal effect, unable to work and noticeably depressed.

His physical examination on presentation included diffuse muscle tenderness over the lower back and painful caudal area. Gait was normal; flexion was normal however extension caused moderate pain with range less than 5 degrees. Rotation to either side was restricted by pain. MRI lumbar spine revealed degenerative changes and multiple diffuse disc bulges, degenerative facet joint changes at L3–4 and L4–5, and s/p lower lumbar fusions at L4–5, L5–S1 levels and laminectomy at L5–S1.

Interventional pain treatments as we searched for his pain generators included numerous diagnostic injections including facet and lumbar median branch injections, transforaminal epidural injections, caudal injections and other treatments unfortunately without providing him meaningful pain relief.

We opted to use spinal endoscopy, anticipating adhesions may be contributing to his post-surgical pain. The first spinal endoscopy revealed multiple dense adhesions inside of the spinal canal and dense fibrotic tissue around the lumbar nerve roots. The preprocedure epidurogram revealed multiple filling defects. After lysis of these adhesions through the endoscope, the epidurogram showed significant improvement in the pattern of nerve path filling. The patient tolerated the procedure well but again he had only a very brief period of pain relief after which he reported his symptoms returned.

As spinal endoscopy with lysis of adhesions was the only treatment that had provided him any absolute pain relief, he was scheduled for a repeat procedure several weeks later.

At this repeat procedure, the epidurogram did not show any significant filling defects. The removal of adhesions from the prior endoscopy procedure significantly improved the visual inspection of the spinal canal. Using fluoroscopic images and the spinal endoscope, the content of the spinal canal was examined in three dimensions. Potential pain generators were examined under direct visualization using either gentle fluid push or slight probing with the steerable, flexible catheter. The patient was fully awake for this procedure; he did not report any pain during the examination of the caudal and lower lumbar epidural space or examination of the exiting nerve roots on the either side.

When the endoscope approached the lower portion of the implanted spinal hardware, as identified on the fluoroscopic images, the patient immediately identified significant pain of the same type and intensity as his usual debilitating symptoms. The endoscopic catheter was pulled back slightly, then this test was was repeated several times with the same results. Under direct visualization, the area was injected with long acting steroids and local anesthetics.

Results

The patient reported significant improvement in his symptoms while in the recovery room; this improvement has now been sustained for over ten months. At this time, he reports significant improvement in his quality of life and has returned to work full time as a carpenter. He is now maintained on a small dose of hydrocodone and pregabalin, and reports his pain now averages between 3–4 on the numeric scale of 0–10 with a much more active lifestyle than he was previously able to tolerate He has no further complains of the burning neuropathic pain in lower back and genitals since this procedure.

Conclusion

Spinal endoscopy with lysis of the adhesion may be helpful tool to identify and treat pain generators in the complex cases of the failed back surgery syndrome. Spinal hardware may be a significant, sometimes overlooked contributor to neuropathic and other types of disabling back pain. In this case, painful hardware syndrome was successfully identified and treated using spinal endoscopy and injection under direct visualization.

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Abstract

Pain management in chronic cervical spine syndrome

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Abstract

There are a few possible factors of chronic neck pain and according to their differences noninvasive conservative and invasive surgical approach to them.As main cause of these very painfull chronic problem could be a cervical disc degeneration,pseudoarthrose,cervical strain or whiplesh, different pathological processes or vascular disorders in cervical segment. Cervical disc degeneration is the most common cause of neck pain with severe headache, spasms in the paraspinal musculature as well as pain in the schoulder or arm, depending of attached segment.Some of the patients has lessions in a few levels. Neurosurgical operation could not be avoid if myelopathy exists.Conservative pain management in the cases without indication for surgical treatment consider pharmacotherapy, physiotherapy, peripheral neurostimulation, anaesthetic blocks,some special excersises or manual manipulation.The article reports lessning the pain symptoms using peripheral neurostimulation,trigger point blocks and some special manipulation when operation is not indicated but suffering of the patients was still present.95 patients treated in Pain Clinic Rebro within last two years, underwent to peripheral neurostimulation, 32 with heavy unilateral headache, 63 with cervicobrachial syndrome average of 60. Some of the patients (10%) received local anesthetic bupivacain 0,5% in trigger points.VAS scale for pain graduation showed significant analgesic effect in 60% of the patients, /from7/8 to 1/2/,mild analgesic effect in 30%,/VAS from 7/8 to 5/6/ and no decisive improvement with 10% of our patients.Improved circulation in attached dermatome and less spasm of paraspinal musculature have been noticed.

Chronic neck pain could be caused by different factors as well as degenerative desease,cervical strain or whiplesh, pathological processes in cervical spine or different vascular disorders *(1)*. Degenerative disease of the cervical spine occurs in the natural process of aging and with Compressing the spinal cord could produce symptomatic radiculopathy and myelopathy *(1)*. Patients with cervical disc degeneration complain of axial pain in the neck by flexion, severe headache with irradiation into occipital area with spasm inthe paraspinal musculature as well as pain in the shoulder or arm, depending which segment of the cervical spine has been attached. According to clinical researces in 15–20% of the patients with chronic unilateral headache the reason of headache was of cervical origin *(3, 5)*. Spondylosis is basically the intervertebral disc disease, where the disc has lost elasticity. This morphological changes could pressure neural structure inside spinal channel with possible outcome of radiculopathy,myelopathy and radiculomyelopathy. While the radiculopathy is ussually treated by conservative therapy, the clinical and radiological myelopathy is almost always treated by surgical operation. The reason is ishemia of the spinal cord tissue caused by spondylotic pressure (osteophyts) in spinal cord blood vessels located in subarachnoidal space *(1)*.

Compressive myelopathy is the most common cause of spastic paraparesis in the middle and older age.Clinical symptoms depend often of the width of the spinal canal. Wide enough, spinal canal could tolerate heavy degenerative changes if the neural structure there are not pressed. From the surgical point of a view, degenerative diseases of the cervical spine could be treated by two basic type of operations: laminectomy and laminoplasty as the posterior approach, and discectomy with fusion or corpectomy as anterior approach *(1)*. The main goal is decompression of neural structures and widening of the spinal canal. The posterior approach is used in the case of stenosis on multiple levels. Unsatisfying effects of posterior approach lead to discovery of the anterior approach during the 60-ies of the last century. (Smith and Robinson,1955., Clovard 1958.,Bailey and Badgley 1960.) *(16)*. Despite the fact that the anterior approach have more risk

(possible nerve or blood vessels injuries, perforation of oesophagus) this method becomes one of the most used neurosurgical procedure, with clinical efficacy around more than 95%. Neurological assessment of the patient is necessary before the operation as well as clinical and radiological examination (standard x-rays and magnetic resonance imaging). Neurosurgery Departmant Rebroannually resolves about 85 patients with such diagnoses.

The patients without indications for the neurosurgical procedures except medicamentose and physiotherapy, underwent to noninvasive approach as peripheral neurostimulation, trigger points blocks with local anaesthetic or manul manipulation to lessening the pain. More than 15% of the patients with cervical syndrome have lumbosacral or thoracal degeneration at the same time.

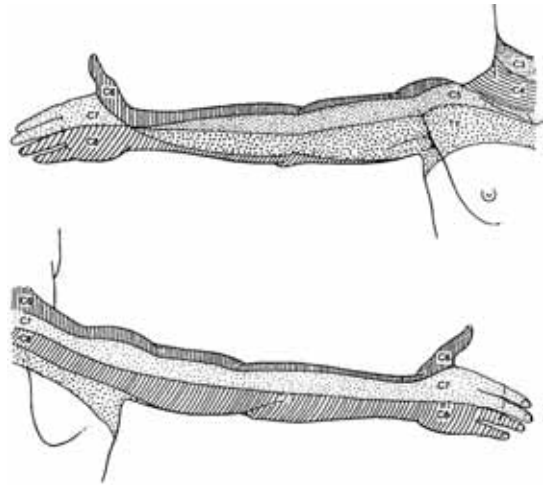

Figure 1. *Pain distribution C3–C8.*

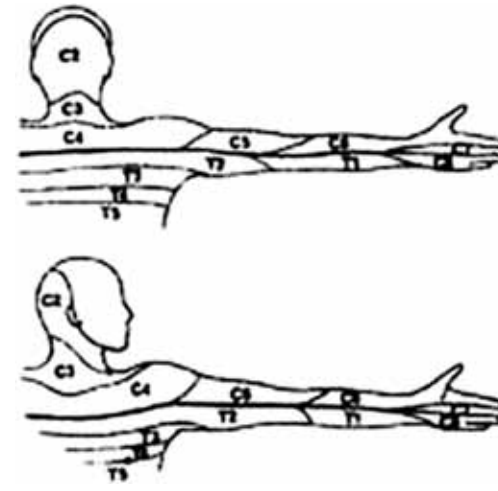

Figure 2. *C4 nerve root distribution.*

In 1983. Sjaastad and coll.introduced the term of cervicogenic headache in medicine.(2, 4) It means chronic hemicranial pain syndrome caused by upper cervicale disorders. The pain starts in the neck of occipital area spreading into frontotemporoorbital part of the head. Referred pain manifasted as cervicogenic headache in anatomical structure, innervated by the first three cervical spine nerves and its irritation (Figure 2.) Headache th mostly doesn't change side, although it is possible to become bilateral with pain in the schoulder or arm the same side of existing headache, sometimes with heavy vertigo (Figure 1).

Neurophysiological researches showed convergence of nociceptive afferents from the receptive field of the trigeminal nerve in the area of the spinal nerves C1-C3 and areas of trigeminal nerve in trigeminocervical nucleus located in the upper segments of the cervical part of the spinal cord *(6).* One of the most often pain center transmission are intervertebral joints as the result of reversibile blockade of moving *(1).* The reason of disffunction could be degenerative disease,traumatic or static-dinamic overlouding in cervical area (reflex spasm or irritation of dura.). Traumatic injuries of the neck could have cervicogenic headache consequences. Diagnostically electromyography or magnetic resonance examination can be helpful. Neck pain occur more often from degenerative discs than from degenerative facet changes. Radiculopathy are caused by herniated nucleus pulposus in the most patients younger than 55 years.Older than 55 are more likely to have channel stenosis by osteophyte formation with involvement ofthe nerve roots *(1).* Depending on different cervical segments, pain sensation are projected into different part of the neck, schoulder or arm (Figure 2) C4 level compression so projected to the posterior neck,musc.trapesius or anterior chest, C5 level-into neck over,posterior schoulder girdle and proximal part of the arm,C6 is the most common place for radiculopathy and weakness presents through biceps musc.along with extensor carpi radialis,neck pain, schoulder, scapule, lateral arm pain,as well as radial forearm,thumb and index finger, C7 level –interscapular through midarm, forearm, while in C8 segment- pain irradiate to the first three fingers *(1, 12).*

Conservative therapy used in the treatment of cervical pain syndrom include pharmacotherapy (NSAIDs, nonopioid and opioid analgetics, s ome kinds of muscle relaxants*,(1,12)* antidepressants as adjuvant analgesics, corticosteroids), physical therapy exercises,soft and hard a collars, cervical manipulations, thermal therapy and peripheral neurostimulation (TENS, acupuncture) *(10)* Cervical epidural corticoid application may be used also, as well as in carefully selected patients radiofrequency ablation.

95 patients underwent to peripheral neurostimulation,performed in painfull dermatome with acupuncture needles electrically stimulated, in classic acupuncture points *(11)* for occipital headache or cervicobrachial syndrome, frequency 1–100 Hz.. The patients were treated 3 times weekly for 30 minutes,15–20 therapies all together.

In 32 of them heavy headache and vertigo were presented, while 63 patients showed chronic cervicobrachial syndrome, average of 60, 70 female, 25 male (Figure 4). Pain score before and after complete therapy according to VAS scale (visual analoque scale) showed significant analgesic effect in 60% of patients. VAS changed from 7/8 atthe beginning of the treatment to 1/2 at the end of the treatment. 30% of the patients showed mild analgetic effect, changing VAS only to 5/6 after the therapy and no decisive improvement was noticed in 10% of the patients. Some of our very painfull patients received a few trigger points infiltration with local anaesthetic bupivacain 0,5% at the beginning of the treatment.

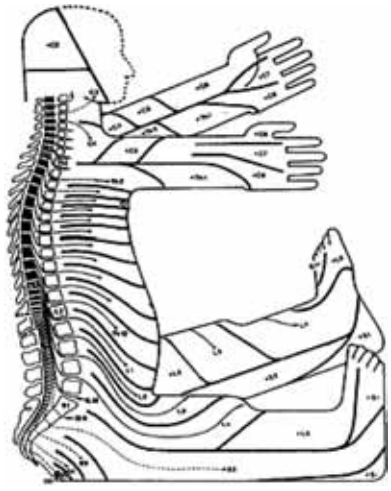

Figure 3. *Segmental innervation of the body.*

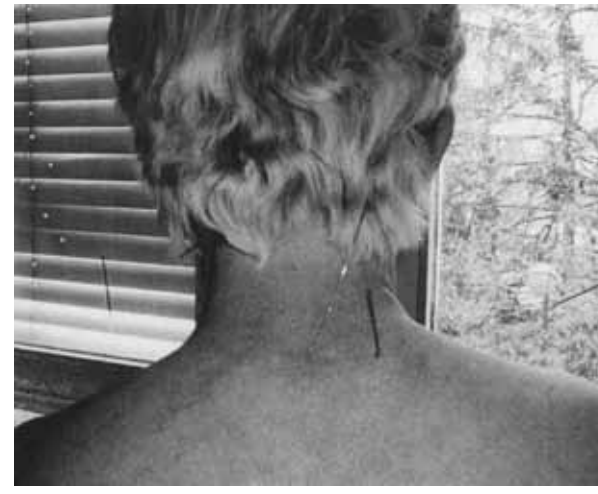

Figure 4. *Neurostimulation.*

The role of manipulation in treatment of neck pain An important part of the multidisciplinary approach to the treatment of cervical pain is the involvement of some variants of manual therapy, especially certain types of manipulations. Our twenty year experience in clinical practice has shown that manipulations are useful in both diagnosis and treatment *(7, 13, 15)*.

The procedure usually involves a manual examination of the cervical and upper thoracic spine, testing mobility, discovering the obstruction and an attempt to discover a position or a move to relieve the present pain by means of gentle manipulation. If a particular kind of manipulation is useful in relieving pain and improving the posture of the cervical spine, a real possibility of patient's self-help exists. In such cases we try to form a regime of exercises for the purpose of relieving pain for each individual patient and then teach the patient how to perform them. Of course, neither manipulation nor exercises are applied in cases where medical documentation prohibits or the patient's pain is intensified. Our experience has shown that improvement in posture and mobility is always associated with more success in fighting cervical pain. The most useful cervical spine manipulations by our opinion are traction (Figure 5) and mobilization (Figure 6).

The patient is instructed how to assist with proper breathing and by focusing his/her eyes while a gentle procedure is employed that produces neck extension and very often relieves pain. Tractions are very easy to apply and often give quick and good results *(7)*.

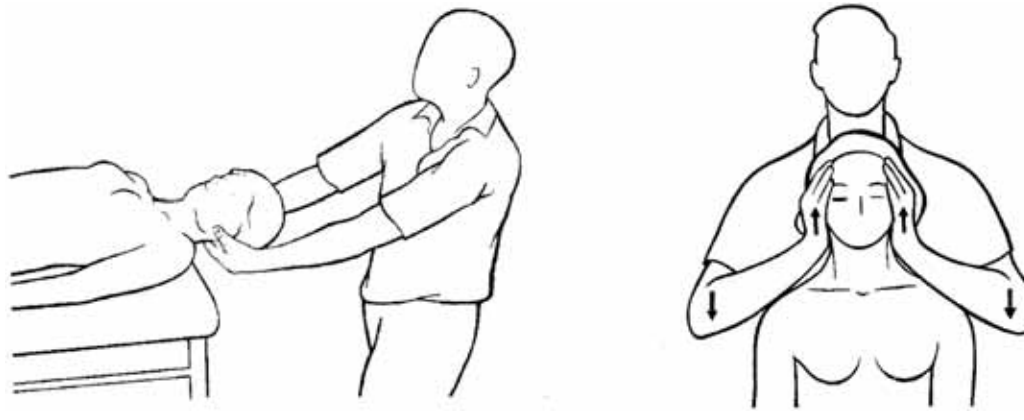

Figure 5. *Traction. Manual tractions are applied in seated or supine positions, depending on a particular situation*.

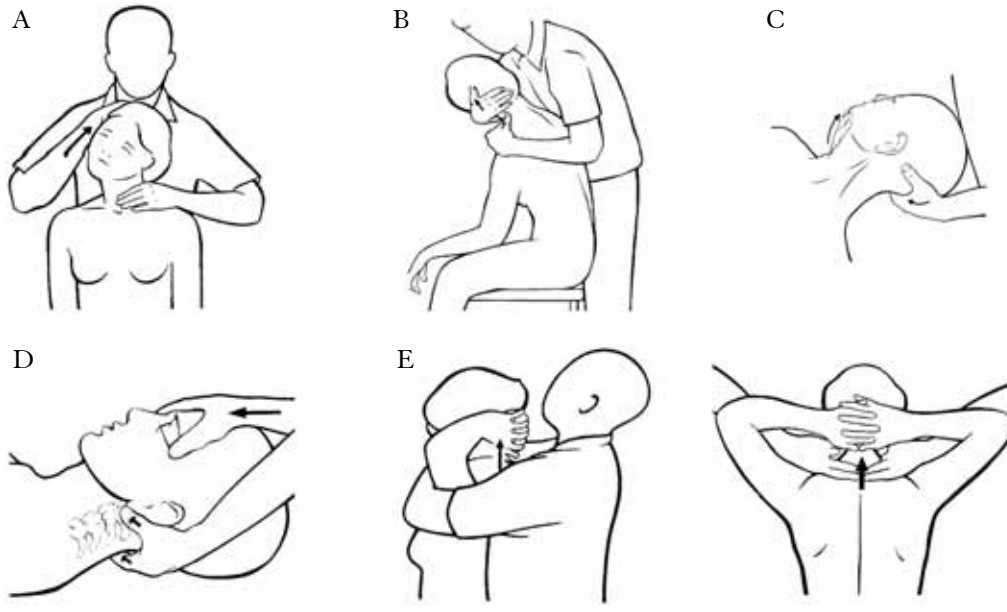

Figure 6A. *Side-bending.* **6B**. *Rotation*. **6C**. *Retroflexion*. **6D.** *Anteflexion.* **6E**. *Thrust technique*.

Mobilization

The goal is to improve the mobility of the cervicothoracic junction, the occiput against the atlas or blocked part of the cervical spine by side-bending, rotation, anteflexion or retroflexion. Each manipulation starts with a typical simple manual examination of the mobility of the neck, but expert training is required. Some of the most useful mobilisation techniques are presented in the following figures (Figure 6A, B; C, D; E).

The thrust technique is a special type of manipulation (Figure 6E). It is based on a quick move with high or low velocity, and requires great skill and more attention in indication and applying *(7, 13)*. After testing is performed, we try to construct a series of easy exercises which the patient will perform on his/her own. Criteria for the chosen exercises depend on the results of the tests and the condition of the patient. Exercises must be easy, without unpleasant feeling and must quickly relieve existing pain. If the motions aggravate pain, they must be changed or eliminated. After determining that a set of chosen motions are useful in treatment of pain and improving neck posture, the patient is given precise instructions. Patients need to exercise frequently but for shorter periods of time, preferably 3–5 minutes every hour whenever possible. It is very important to teach patients how to relieve pain with the learned exercises anywhere and any time because prolonged blockades brought on by muscle spasms cause trophic ischemic changes that aggravate pain and prolonged treatment *(15)*.

As a conclusion we can say that diagnose of chronic cervical syndrom could have many different approaches but the main importance is to help our patients on the right way depending of indication,of course. It means if it is possible improvement of symptoms by conservative therapy or surgicaly, if it is indicated.

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Abstract

How to avoid neurological damage – ESRA recommendations for good clinical practice

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Serious neurological damage associated with regional anaesthesia is extremely rare; the mean incidence of permanent damage is approximately 1:10,000, although the range varies from 0.1:10,000 for damage after obstetric epidural nerve damage *(1)* to 7.6:10,000 in a high risk surgical group *(2)* with a difference between the risks for spinal and epidural techniques. Spinal anaesthesia is associated with a higher risk of persistent nerve damage than epidural injection although the relative risks vary in different reviews. Because of the rarity of serious damage, it is not possible to study the incidence in an evidence-based manner, using large prospective randomized studies or systematic reviews of such studies. The published evidence is limited to reviews of the major risk factors leading to neurological damage from both spinal and epidural anaesthesia *(3)*, editorials *(4, 5, 6),* case reports and case series *(7, 8)*. Two large retrospective, closed claims analyses of nerve injury associated with both general and regional anaesthesia have provided a large database of information about the types of injury and their association with regional or general anaesthesia *(9, 10)*. These studies provide great insight into the changing trends of nerve injury over a twenty year period of growth in the use of regional anaesthesia but provide very limited information about the mechanisms of injury and give no recommendations as to how we can minimise risks.

Permanent, severe damage to major peripheral nerves is also very rare. Auroy recorded an incidence of 0.019% for nerve damage in a large prospective survey *(11)*. The published data for paediatric injury is even lower *(12)*, although quoted incidences vary as some studies include transient nerve root or peripheral nerve damage which is more common but invariably recovers spontaneously within a matter of weeks or months *(13)*. Smaller studies of nerve injury following peripheral nerve block reveal a range of up to 5% depending on the type of peripheral block studied although there is usually no distinction between temporary and permanent symptoms. However, the increase in the use of peripheral nerve blocks has been associated with an increase in the reported complications of peripheral nerve blocks *(14, 15, 16)*. There is a debate about whether this rise is just a reflection of the increased use of these techniques or due to a general increase in reporting rates and a decreased threshold for resorting to medico-legal action. There remains a lack of objective data about both the numerator (the number of complications) and denominator (the total number of blocks performed). If regional anaesthesia is to retain its current popularity, it is important to ensure that peripheral nerve blockade is practiced to the highest standards of safety and best practice.

Without graded evidence and recommendations, ESRA can only publish advice in the form of Good Practice Guidelines and advice to help reduce the risk of nerve damage has already been presented at the 2003 and 2004 ESRA Annual Congress *(17, 18, 19)*.

Causes of neurological damage

General causes of peripheral neurological injury are listed in figure 1. Peri-operative nerve injury may occur in patients who have a general anaesthetic only, as a consequence of surgical nerve injury or due to postural compression or traction *(9, 10, 20)*. It is important therefore to establish what role, if any, a regional anaesthetic technique may have played in the direct causation of the nerve injury to avoid blame being apportioned to regional anaesthesia when the damage is actually due to another cause.

There are three elements to developing safe practice for peripheral nerve blockade and minimising the risk of nerve injury.

1.The Patient

Patients expect to be involved more closely in their medical care than in previous years. Detailed but easy to understand patient information leaflets about regional anaesthesia, including the risks, are now available *(21)* to enable balanced preoperative discussions and properly informed consent. Informed consent is an essential prerequisite to safe practice; the amount of detail of risk and benefit that patients expect will vary between individuals but each must have the opportunity and relevant information to be able to make a rational decision.

Table 1

The main causes of peri-operative neurological damage.

- Failure of technique
  - primary (multiple attempts)
  - secondary (apparent successful location of nerve but no clinical effect)
- Poor patient management
  - Failure to manage side effects may convert them to complications
- Direct nerve trauma
  - needle damage to spinal cord, major peripheral nerve or plexus
  - intraneural injection
  - surgical injury
  - compression
  - traction
- Infection
  - viral/bacterial
  - epidural/intrathecal
  - Perineural – risk of central spread (paravertebral/psoas compartment)
- Haematoma
  - epidural
  - psoas sheath/brachial plexus
- Drug toxicity
  - TNS – transient neurological symptoms
  - Drug error
  - Systemic overdose
  - Intravascular injection
- Miscellaneous
  - anterior spinal artery syndrome
  - spinal cord infarction
  - pre-existing co-morbidity
  - spinal arteriovenous malformation, meningioma,
  - prolapsed disc,
  - multiple sclerosis, Guillain-Barré Syndrome,

Performing and documenting the block

The doctor performing the block must posses the requisite theoretical and practical knowledge and competence to minimize the risks of neurological damage.

Table 2

Criteria for minimising risks of neurological damage

- Careful patient selection
- Sound anatomical knowledge of the block in question
- Proper supervised training
- Regular practice
- Careful, subtle technique
- Familiarity with equipment and needles
- High index of suspicion with difficulties and a readiness to avoid repeated attempts
- Careful patient selection and assessment of pre-existing neurological, endocrine or microvascular co-morbidity
- Appropriate modification of any accompanying anaesthetic
- Careful management of block during and after surgery

There is a mandatory requirement to record all the important facts relating to the performance and management of a block. The amount of information recorded will vary according to the complexity of the block but the minimum dataset for all major techniques should include the parameters listed in table 3

Table 3

Documenting the regional block

• Named technique and approach
• Needle insertion site (where relevant)
• Number of attempts
• Type of needle
• Use of nerve stimulator (or not)
• Use of catheter
• The agent, its concentration and volume (including vasoconstrictor or other additives)
• Onset times for motor and sensory block (bilateral or unilateral)
• Extent of dermatomal block and degree of motor block
• The occurrence of any paraesthesiae or pain on needle or catheter insertion
• Bleeding or other sequelae of the injection
• If a catheter is inserted, the time and date of its removal + any adverse sequelae noted

Table 4 lists specific advice for the safe conduct of peripheral nerve blockade

Table 4

Recommendations for safe peripheral block techniques

• Use a peripheral nerve stimulator for all motor or mixed nerve blocks but remain vigilant
• Avoid paresthesiae and pain when inserting the needle; remove the needle if they occur!
• Heavy sedation/light GA will prevent patient feedback – be aware
• Avoid stimulus threshold of < 0.3mA
• Do not inject against resistance (ensure needle is patent and understand what low resistance injection feels like)
• Slow incremental injection with regular aspiration
• Respect maximum recommended doses

1. Risk Management Issues

Safe practice requires a formal, systematic approach to managing clinical risk; the care and management of the patient for the entire duration of the block must also be planned to ensure safety. A properly organized, integrated care pathway should ensure that patients will be safely managed in hospital, in a step down unit or at home for the duration of the block (up to 48 – 72 hours, if a catheter infusion is used). All staff involved in caring for this group of patients should be aware of the importance of:

- Management of the insensate limb *(22, 23)*
- Provision of adequate sequential analgesia as the block wears off.
- Risk awareness of potential complications of the block (nerve damage)
- Risk awareness of potential surgical complications (ischaemia, compartment syndrome, infection)
- Adequate hospital back-up for patient contact re: pain problems following discharge
- Proper documentation of the procedure *(24)*
- Standardised paperwork, drug combinations and delivery hardware
- Pre-filled syringes/infusions
- Clear lines of communication for all staff
- Effective monitoring and audit systems

Managing nerve damage.

Permanent serious morbidity is extremely rare and it is difficult to make general assumptions about the factors involved and how they can be reduced even further. One of the features of nerve damage from regional anaesthesia is that it is usually impossible to determine the mechanism of damage in the majority of cases *(10)*. In 1961, Greene suggested a criteria system for establishing whether a spinal anesthesia was directly implicated in any neurological damage *(25)*.

- Is the legion intradural?
- Did the onset of symptoms coincide with the block?
- Were there previous symptoms antecedent to the block?
- Is the pathological change consistent with those due to spinal anesthesia?
- Is the pathological damage actually due to the anesthesia?

These criteria remain valid today and if used early enough can direct neurological and radiological investigation in a targeted way so that early intervention may be appropriate and therapeutic (surgical exploration of spinal haematoma or abscess for example).

Table 5

A task list for investigating, diagnosing and treating peripheral nerve damage

- Ensure that the pharmacological effects of any local anaesthetic drug or adjuvant agent have fully regressed. Assess the area for the return of motor, sensory, proprioceptive and autonomic nerve function
- Involve an experienced regional anaesthetist in the review of any potential nerve injuries.
- Take a careful history especially looking for any pre-existing neurological problems. Spinal stenosis may be sub-clinical unless careful assessment is made
- Obtain an early, formal neurological examination by a neurologist who understands the practice of regional anaesthesia
- Exclude other causes (Surgical injury, Ischaemia, Compression)
- Define the anatomical basis of the damage
  - Motor, sensory, autonomic, proprioceptive, mixed
  - Upper motor neurone, lower motor neurone
  - Root, plexus, trunk, branch
  - Dermatomal or discrete nerve distribution
- Does the pattern of nerve damage match the territory of the regional anaesthetic technique used?
  - Is the damage spatially related to the needle insertion site?
  - Is it within the surgical site?
  - Could compression or traction match the site of injury?
- Early electrophysiological testing and radiological imaging
  - Sensory nerve conduction, somatosensory evoked potentials, motor nerve conduction, electromyography (EMG), sudomotor test of sympathetic function
- Imaging
  - Ultrasonography
  - CT
  - MRI
- Ensure that colleagues know what you are looking for
- Be patient, the great majority resolve in time.
- Treatment options are limited

Diagnosis of Neurological Injury

The options for treating or alleviating major nerve damage following injury from any cause are limited. It is therefore important to develop and use strategies and guidelines to prevent or minimize the risk of nerve damage from all causes for patients undergoing surgery. It is also important to recognize that nerve damage may have occurred and to diagnose the likely mechanism as early as possible as well as the level at which the damage to the central or peripheral nervous system has occurred. While few causes of damage are amenable to surgical intervention, it is vital to diagnose these with the minimum of delay as prompt surgery may restore most, if not all, function.

Investigation of Neurological Damage

As outlined in the task list, after taking a detailed history and performing a thorough and detailed examination, early and appropriate electrophysiological and radiological examination is essential. Detailed explanation of the role of these tests is beyond the scope of this presentation but they reviewed in some detail by Hogan *et al (26)*. The timing

of these tests is important however. Early MRI scan will detect haematoma or abscess formation and is the most appropriate imaging modality for soft tissue compression or injury to the spinal cord or nerve plexuses. CT imaging is more appropriate for bony abnormalities of the spinal canal and intervertebral foraminae.

Motor conduction studies, sensory conduction (or somatosensory evoked potentials) should be performed immediately (1–3 days post injury) to assess the early degree of damage and then repeated at intervals for up to 6 months, depending on

the rate of recovery. After 6 months the chances of further significant recovery are small and patients should be followed up by observation only after this time, if necessary.

If electromyography (EMG) is used too soon in the investigation of nerve damage, no abnormality will be detected, unless one pre-dated the apparent injury, because they are diagnostic for denervation rather than acute injury and therefore will not become abnormal for several days. Some authorities recommend a baseline EMG as soon as the injury is suspected just in case there is pre-existing damage, with repeated EMG at 3 weeks and then monthly to 3 months to track the degree of damage and any subsequent recovery.

Surgery has a limited role in the delayed treatment of scarring to the brachial plexus and other major neurological structures where significant scarring from trauma or haemorrhage is involved. Nerve grafting may also have a limited role where damage is limited to a single nerve.

Most treatment is supportive only and aimed at alleviating the effects of the damage and limiting any further extension of the damage. It is important to prevent indirect disability and injury due to lack of motor, sensory and proprioceptive awareness. Joints and limbs need protection from contractures, hyperextension injury, thermal or pressure injury. Long term rehabilitation and physiotherapy support is the mainstay of treatment for many of these patients; in addition autonomic disruption to bladder, bowel and other visceral function often necessitates additional long-term treatment for these organs.

Treatment of neurological damage

There are few indications for active interventional treatment. The major indications are the early relief of spinal cord compression due to vertebral canal haematoma or epidural abscess. However, even with early surgery recovery may only be partial – only about 20% of cases have complete recovery – and emergency laminectomy in high risk patients carries a significant risk of morbidity and mortality. Surgery has a limited role in the delayed treatment of scarring to the brachial plexus and other major neurological structures where significant scarring from trauma or haemorrhage is involved. Nerve grafting may also have a limited role where damage is limited to a single nerve.

Most treatment is supportive only and aimed at alleviating the effects of the damage and limiting any further extension of the damage. It is important to prevent indirect disability and injury due to lack of motor, sensory and proprioceptive awareness. Joints and limbs need protection from contractures, hyperextension injury, thermal or pressure injury. Long term rehabilitation and physiotherapy support is the mainstay of treatment for many of these patients.

Conclusions

Regional anaesthesia, by its very nature, is an invasive practical procedure which involves placing needle tips in close proximity to delicate nerve structures and then injecting potent local anaesthetic and other adjuvant drugs around the nerves. Complications are an inevitable consequence of medical practice and it is unrealistic to assume that nerve damage can be completely avoided. However, by developing a comprehensive, consistent and practical approach to the teaching and practice of regional anaesthesia, every anaesthetic department should ensure that all its members adopt high standards of practice and use appropriate levels of care when performing regional anaesthesia.

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Abstract

Splint treatment of osteoarthrits of temporomandibular joint

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Degenerative osteoarthritis (OA) of temporomandibular joint (TMJ) is a form of arthrogenic temporomandibular disorders *(1, 2)*. The purpose of this study is to determine the success of short-term occlusal splint treatment at patients with OA of TMJ.

Methods: 16 patients (median of age 41.5, 69% women) with OA collected in the period 2001–2006 on the basis of clinical examinations and by magnetic resonance imaging (MRI), computerized tomography and conventional radiography of TMJ (Figure 1). The temporomandibular pain was evaluated with analogous visual scale. Psychological status of the patients was confirmed by State-Trait Anxiety Inventory (STAI) *(3)*. Occlusal splint treatment was followed during 3–6 months (Figure 2).

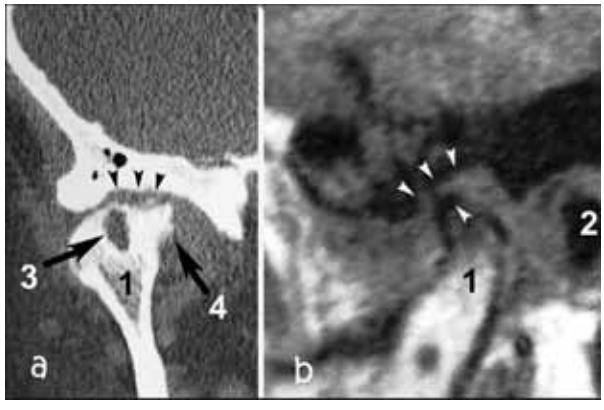

Figure 1. *Osteoarthritic TMJ in coronar plane by computerized tomography (a) and sagittal plane by MRI (b): 1 – condyle, 2 – external auditary meatus, 3 – osteoarthritic cyst, 4 – osteophyte formation, arrows – sclerosis of the articular eminence and condylar surfaces.*

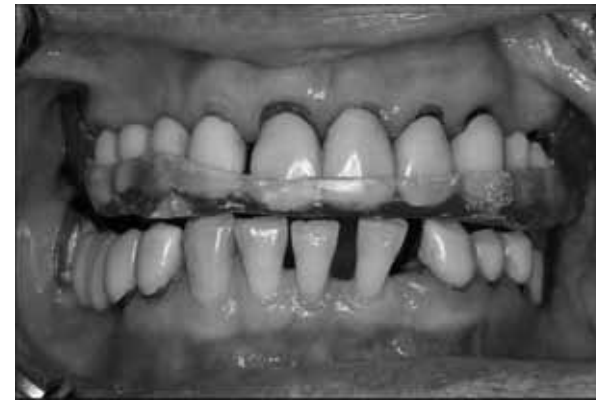

Figure 2. *Occlusal splint in the patient's mouth.*

Results: OA was diagnosed in 62.5% of all TMJs, in 25% of the patients bilaterally. Clinical diagnostics and MRI findings of OA were matching in 12 (75%) patients. The most frequent symptoms felt by the patients were pain (95%) and crepitation (80%) in TMJs. 19% of the patients had acute pain (duration =3 months), 37% had subacute pain (=12 months) and 44% of the patients experienced chronic pain (>12 months). The median of pain evaluated by analogous visual scale was 7 (range 9.8–3.0) before and 1 (range 6–0) after splint treatment. The mean score in STAI 1 was 40.69 and STAI 2 was 42.44.

Conclusion: Applying the occlusal splint resulted in painless TMJs (also painless crepitation) in 63% patients. A higher average level of anxiety was determined by STAI for all examined patients.

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Hemodynamic changes in central blocks and general anaesthesia

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Abstract

A maintenance of hemodynamic stability during anesthesia is a major goal for the anaesthesiologist. Independent of the type and magnitude of surgery, anesthesia is associated with significant impact on systemic hemodynamics. There is an ongoing controversy, whether regional or general anesthesia better preserves and provides hemodynamic stability. In this article the effects of general and regional anesthesia on hemodynamic stability are discussed.

Recently, it was demonstrated that all volatile anesthetics reduce infarct size under experimental conditions and markers of myocardial ischemic damage (e.g. Troponin I) in patients undergoing coronary bypass graft surgery. Moreover, general anesthesia with volatile anesthetics may be preferable in cardiac high risk patients due to the additional advantage of cardioprotection by anesthetic-induced preconditioning. Intravenous anaesthetics confer more complex effects on hemodynamics, depending on the individual substance used.

The impact of regional anesthesia on hemodynamic parameters is independent of the specific local anesthetic agent. It is determined mainly by the type of the blockade, i.e. central versus peripheral block, and the level of the block height. While peripheral blocks usually have no impact on systemic hemodynamics, central neural blocks decrease blood pressure by the blockade of preganglionic sympathetic fibers with a consequent reduction in systemic vascular resistance. Hypotension associated with central blocks can successfully be treated with intravenous fluids and vasopressors.

Both general and regional anesthesia can safely be performed, even when hemodynamic stability is critical according to risk factors or morbidity. Hemodynamic effects are minimized by a combination of intravenous opioids and volatile anesthetics.

Introduction

Independent of the type and magnitude of surgery, anesthesia is associated with significant impact on systemic hemodynamics. While short-lived hemodynamic effects of anesthetics are of little concern to ASA physical status I patients, patients at increased cardiac risk can be jeopardized by altered hemodynamics. Tachycardia, bradycardia, hypotension and hypertension during the course of anesthesia and surgery can result in severe and life-threatening complications, e.g. myocardial ischemia, with a consecutively increased risk of perioperative myocardial infarction and worsened outcome in these patients *(1, 2)*. Furthermore, parturients undergoing caesarean section carry an increased risk of hypotension that may result in severe fetal acidosis *(3)*. Thus, optimal hemodynamic stability is a major concern in these patients. There is an ongoing controversy, whether regional or general anesthesia better preserves and provides hemodynamic stability. To this end, the effects of general and regional anesthesia on hemodynamic stability are discussed.

General Anesthesia

Inhaled anesthetics

Nitrous oxide directly depresses myocardial contractility. However, blood pressure, heart rate and cardiac output are virtually unchanged due to a direct stimulation of the sympathetic nervous system *(4)*. In patients with chronic heart failure or severe coronary stenosis with elevation of circulating catecholamines, myocardial depression might be precipitated and

unmasked. Volatile anesthetics like isoflurane *(5),* sevoflurane *(5),* and desflurane *(6)* dose-dependently decrease blood pressure mainly by decreasing systemic vascular resistence, whereas halothane-induced blood pressure decrease *(7)* is caused by a more pronounced decrease in myocardial contractility. Myocardial contractility is depressed by desflurane and sevoflurane as indicated by increased cardiac filling pressures and decreased stroke volume index *(6, 8, 9)*. However, cardiac output is preserved and with prolonged anesthesia,

cardiovascular depression is abated *(6)*. Volatile anesthetics have a small therapeutic index and excessive doses can induce cardiovascular collapse *(10)*. Isoflurane, desflurane, and sevoflurane, but not halothane increase heart rate when administered to healthy volunteers. Sevoflurane increases heart rate only at concentrations > 1.5 minimum alveolar concentration (MAC), whereas isoflurane and desflurane tend to increase heart rate at lower concentrations *(5)*. However, the concurrent administration of opioids, as common in the concept of »balanced anesthesia«, eliminates these adverse effects *(11)*.

Since volatile anesthetics have a negative impact on myocardial contractility, it was suggested that patients at increased cardiac risk should receive intravenous anesthetics or regional anesthesia, where applicable. However, regardless of their effects on systemic hemodynamics, a well conducted large randomized controlled trial evaluating an i.v. based versus a volatile anesthetic based anesthesia regimen could not find any difference between i.v. and volatile anesthetics *(12)*. Recently, it was demonstrated that all volatile anesthetics reduce infarct size under experimental conditions *(13–16)* and markers of myocardial ischemic damage (e.g. Troponin I) in patients undergoing coronary bypass graft surgery *(17–19)*.This phenomenon has been coined »anesthetic-induced preconditioning«. Thus, due to their beneficial cardioprotective effects, volatile anesthetic should be preferred in cardiac high risk patients.

Intravenous agents

While the cardiovascular effects of the different volatile anesthetics are very similar, intravenous anaesthetics confer more complex effects on hemodynamics, depending on the individual substance used. Propofol decreases systolic blood pressure by 30% in patients during induction and maintenance of anesthesia by a reduction of systemic vascular resistance *(20)*. In elderly patients, the induction of anesthesia with propofol results in a lower mean arterial pressure than induction per inhalationem with sevoflurane *(21)*. Etomidate is known to have only minor effects on heart rate and blood pressure and does not release histamine *(22)*. However, in the failing heart, blood pressure is maintained during etomidate induction as a result of an increase of left ventricular afterload *(23)*.Barbiturates, e.g. thiopenthal, lead only to mild and transient reduction of blood pressure in euvolemic patients and heart rate is increased by baroreceptor reflex sympathetic stimulation that compensates for the decrease in peripheral vascular resistance. Myocardial contractility is minimally affected at doses clinically used, however, higher doses can reduce contractility. Thiopental induces histamine release which can result in severe hypotension *(24)*.

Ketamine directly stimulates the sympathetic nervous system which results in increased systemic and pulmonary artery blood pressure, heart rate, cardiac output and myocardial oxygen demand. The direct myocardial depression induced by ketamine is masked by the symphathetic stimulation. However, in patients with exhausted compensatory resources of the symphathetic nervous system, hypotension can be induced by ketamine. At equipotent doses the cardiovascular effect of the S(+) enantiomer of ketamine is less pronounced compared to racemic ketamine *(25)*.The effects of benzodiazepines on systemic hemodynamics are only marginal. A slight decrease in arterial blood pressure, triggered by a reduction in systemic vascular resistance can occur, while heart rate, filling pressures and myocardial contractility are virtually unchanged. Opioids like morphine can induce bradycardia and slight hypotension by stimulation of the vagal nucleus in the medulla and by venous vasodilation, respectively *(26*). Morphine can induce histamine release *(27)*.

Regional Anesthesia

The impact of regional anesthesia on hemodynamic parameters is determined mainly by the type of the blockade, i.e. central versus peripheral block, and the level of the block height and independent of the specific local anesthetic agent. While peripheral blocks usually have no impact on systemic hemodynamics, central neural blocks decrease blood pressure by the blockade of preganglionic sympathetic fibers with a consequent reduction in systemic vascular resistance. This results in venous pooling and redistribution of circulating volume to the lower extremities and the splanchnic area *(28)*.These effects are aggravated in hypovolemic patients and in the elderly *(29)*. In spinal anesthesia, hypotension is often more severe than in epidural anesthesia, since the onset of the sympathetic blockade is more abrupt and faster. The sympathetic innervation of the heart is provided by nerve fibres originating from medullary levels of T2 to T4. A block that includes these segments can result in bradycardia and hypotension and vagal activity prevails. In a study including 952 patients receiving spinal anesthesia, the incidence of hypotension, defined as systolic blood pressure < 90 mmHg, was 33% and the incidence of bradycardia was 13% *(30)*.The study demonstrated that minimizing peak block height, using plain solutions and no administration of phenylephrine, and performing the spinal puncture at or below the L3-L4 interspace is correlated with a reduction of hemodynamic side

effects of spinal anesthesia. In a study including 3100 patients, arterial blood pressure drop was recorded in 99% of patients within 30 min after the induction of spinal anesthesia. However, decreases of arterial pressure were mainly moderate ranging from 10 to 20% of baseline values and reductions of 20% to 30% were found in 20% of all patients. In 50% of these patients either fluids or vasopressors were used to correct hemodynamics *(31)*.

Epidural anesthesia has been suggested to be favourable for patients at cardiac risk, e.g. in cardiac surgery *(32)*. In animal experiments, myocardial oxygen supply is improved by cardiac sympathectomy via thoracic epidural catheters *(33)*. Clinical studies furthermore demonstrated improved hemodynamic stability in patients with thoracic epidurals undergoing cardiac surgery *(34, 35)*. However, a recent study comparing thoracic epidural analgesia with patient controlled analgesia with intravenous morphine in 113 patients undergoing cardiac surgery did not detect any difference in mortality or the incidence of postoperative cardiac complications like myocardial infarction *(36)*. Furthermore, a meta-analysis of fifteen studies including 1178 patients was not able to demonstrate improved outcome or any reduction in the incidence of cardiac complications by the use of central neuraxial techniques after CABG surgery *(37)*.

General or regional anesthesia for patients at risk?

Patients with coronary heart disease are at increased risk for perioperative myocardial ischemia and infarction and periods of hemodynamic alterations with increased perioperative morbidity and mortality. Thus, maintenance of hemodynamic stability during anesthesia is a major goal for the anaesthesiologist. Three questions need to be answered within this context: 1. What is the impact of the anesthetic technique on systemic hemodynamics and are there any advantages regarding hemodynamic stability related to the choice of either regional or general anesthesia? 2. How can adverse hemodynamic effects of regional or general anesthesia be prevented or treated successfully? 3. Does the choice of the anesthetic regimen (regional vs. general anesthesia) have an impact on outcome?

1. Both general and regional anesthesia, with the exception of peripheral nerve blocks, negatively influence systemic hemodynamics. Thus, if peripheral nerve blocks cannot be performed due to surgery or patient, there is no advantage of either general or regional anesthesia regarding hemodynamics.

2. Hypotensive episodes can be treated by intravenous crystalloids or colloids, vasopressors and, if applicable, trendelenburg positioning. Bradycardia due to blockade of sympathetic fibres to the heart in central neural blocks can be reversed by the administration of atropine. Reflex tachycardia, induced by decreased systemic vascular resistance can be treated with intravenous fluids. However, close monitoring of hemodynamic parameters is mandatory. In obstetric patients, prophylactic administration of intravenous fluids or vasopressors has not been demonstrated to satisfactorily prevent hypotension after spinal anesthesia *(38)*.

3. Several studies have tried to clarify whether regional or general anesthesia is superior to the other with regard to outcome. Two large recent trials comparing epidural anesthesia versus general anesthesia or a combined anesthesia in patients undergoing major abdominal surgery were not able to detect any difference in perioperative morbidity or mortality *(39, 40)*. As described above, patients at cardiac risk undergoing CABG surgery do not benefit from central neuraxial blockade *(36, 37)*. Furthermore, there is no difference in mortality or cardiac adverse events between general, spinal or epidural anesthesia in patients undergoing peripheral vascular surgery *(41)*. In contrast, one recent meta-analysis demonstrated a 30% reduction in mortality in patients receiving neuraxial blockade *(42)*. However, this reduction is exclusively caused by studies in patients undergoing orthopaedic surgery. Another meta-analysis detected a reduced rate of perioperative myocardial infarction in patients with epidural analgesia *(43)*. Since myocardial infarction frequently occurs postoperatively, only studies that used epidural analgesia continuously for the first 24 h postoperatively were included in the analysis. Thoracic epdidural was more effective than lumbar epidural. Whether this beneficial effect is caused by differences in systemic hemodynamics is unclear. Controlled hypotension, induced by epidural anesthesia in hypertensive patients undergoing total hip arthroplasty does not result in adverse cardiac events or worsened outcome *(44)*. Taken these results together, there is no evidence that regional anesthesia is superior to general anesthesia regarding perioperative morbidity and mortality in patients undergoing major surgery.

Conclusion

The general and regional anesthesia can safely be performed, even when hemodynamic stability is critical according to risk factors or morbidity. Hypotension associated with central blocks can successfully be treated with intravenous fluids and vasopressors. Hemodynamic effects are minimized by a combination of intravenous opioids and volatile

anesthetics. Moreover, general anesthesia with volatile anesthetics may be preferable in cardiac high risk patients due to the additional advantage of cardioprotection by anesthetic-induced preconditioning.

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Abstract

What to do if your block is not successful

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Failure is an intrinsic part of regional anaesthesia; published failure rates for central and peripheral blocks vary from 65% to 98%. As such, failure is the commonest complication of regional anaesthesia. Lack of success occurs in two distinct phases, complete failure or an inadequate block but occasionally a block may be so slow in onset as to be thought inadequate, only for it to be ultimately successful (usually after a general anaesthetic has been used too soon!)*(1)*.

Primary Failure (failure of technique)

1. Inability to perform the block at all
   a. Difficult anatomy
   b. Multiple attempts
   c. Complication of insertion (blood in needle, pain)
2. Failure to produce adequate effect, despite a successful performance of the technique
   a. Wrong site of insertion (epidural, brachial plexus block)
   b. Wrong drug, dose, volume or concentration (spinal)
   c. Failure of unknown origin!

Secondary Failure (failure of management)

1. A working block becomes inadequate
   a. Surgery outlasts duration of block e.g. spinal
   b. Surgery extends beyond initial surgical site
2. The initial bolus injection is adequate but top-up boluses or infusions via catheter are not successful (CSE, continuous spinal)
3. Patient management problems
   a. Psychological failure: patient unwilling or unable to tolerate operation under RA, despite preoperative information and assessment
   b. Patient becomes confused or restless due to prolonged surgery, complications of the operation or inappropriate sedation

The strategy for coping with unsuccessful blocks varies according to the specific technique being used and whether the failure is primary or secondary. It is not possible to give detailed coping mechanisms for each block in one lecture but general advice is available for central and peripheral nerve blocks and can be adapted for a specific situation.

Central nerve blocks

A. Spinal

Primary failure: Multiple attempts at spinal anaesthesia are one of the major risk factors for neurological damage associated with spinal anaesthesia. Therefore if difficulty in locating the CSF endpoint is experienced, have no more than 3 attempts and then either seek more experienced assistance or consider an alternative anaesthetic technique. The other possibility is that despite entering CSF and injecting local anaesthetic, an inadequate block height or block density results

in inadequate surgical anaesthesia, usually because insufficient drug mass has been used or the block has been put in at the wrong level *(2)*

Plan: Always discuss risk of failure as part of preoperative assessment. If surgery is amenable to another regional technique (peripheral block(s), infiltration or a combination) then proceed with this. General anaesthesia should also be discussed, if the patient is suitable, in which case this may offer a suitable alternative. Alternatively, the operation may need to be postponed for adequate consultation and planning of an alternative strategy.

Secondary failure: A slow surgeon or prolonged procedure may see the block regress to a point where the patient becomes aware of the surgery. Or, at the onset of surgery, the patient complains of painful awareness of the surgery, despite the block giving a satisfactory response to objective testing prior to the start of the operation.

Plan: Should you offer a light general anaesthetic or use intravenous sedation to cover the failing block? This will depend on the degree of awareness and how close to the end of surgery the surgeon is. Both options have risks, which need to be carefully considered.

Should you perform a repeat spinal if the first one fails? Probably not, as experience with some of the older local anaesthetics suggests that there is an increased risk of nerve damage, if a partially successful spinal is reinforced with a second spinal injection. Similar problems have occurred with continuous spinal anaesthesia when excessive supplementation of a patchy block occurs.

B. Epidural

Primary failure: An epidural for surgery and/or postoperative analgesia can be technically demanding, especially in the morbidly obese and there is an overall failure rate of about 10% (primary and/or secondary). If it proves difficult or impossible to locate the epidural space there is little alternative to a general anaesthetic and systemic opioids for analgesia. Multiple attempts, difficult anatomy and lack of experience account for most of the serious adverse events, which complicate epidural blocks. In some patients, it may be possible to attempt a spinal anaesthetic instead or use a more peripheral local anaesthetic technique.

Secondary failure: Assuming successful location of the epidural space, threading the catheter and establishing a symmetrical dense block is not always possible and a unilateral, patchy or insufficient block can result.

Plan:

1. Use saline rather than air for loss of resistance *(3)*
2. Slowly inject a fractionated dose of the local anaesthetic before inserting the catheter. Both these methods reduce the risk of an asymmetrical or inadequate epidural block *(4)*
3. If the block is still asymmetrical, consider withdrawing catheter 1–2 cm and injecting a top-up dose and/or position patient laterally with the unblocked segments downwards to allow gravity to assist with the distribution of the local anaesthetic.
4. A paramedian approach to the epidural space is associated with greater success at inserting the catheter and a lower risk of paraesthesiae *(5)*
5. Re-siting the epidural catheter, converting to a spinal or administering a general anaesthetic are the only realistic options to overcome an inadequate epidural

C. Peripheral nerve blocks

The same general principles of primary and secondary failure apply to peripheral blocks. Due to the large number of individual peripheral techniques, it is not possible to give detailed strategies for each failed block. However some general advice is possible. If lacking experience with a particular technique, seek more experienced assistance to supervise your effort or take over in the event of difficulty. Multiple attempts are a significant cause of both failure and nerve damage.

Primary failure: if unable to locate the desired nerve/plexus with a peripheral nerve stimulator (or ultrasound) consider a different approach to the same nerve/plexus. If you have located the desired nerve/plexus and injected local anaesthetic but produced no block within about 20 minutes it is reasonable to assume that the block has failed. It is possible to repeat the block after a suitable time delay – say half of the local anaesthetic elimination half-life, using a reduced dose (if the original injection was a large volume) to avoid systemic toxicity. If delay is not possible, the only prqctical alternative is to use general anaesthesia and maybe repeat the block at the end of surgery for postoperative analgesia.

Secondary failure: this is more common than primary failure – a partially effective brachial or lumbar plexus block is relatively common. It is possible to reinforce the block with more distal blocks of the terminal nerves but the risk of traumatic neuritis is quite high (possibly up to 25% depending on circumstances). In the upper limb, unblocked terminal nerves can be blocked at the elbow or wrist and in the lower limb reinforcing blocks of the femoral and sciatic can be done at the appropriate level.

Conclusion

A lack of success is usually due to a failure to put the right dose of the right drug in the right place. Before considering whether to repeat the original block or use additional »rescue« blocks, it is essential to protect the patient from the risks of systemic toxicity, by avoiding excessive volumes and concentrations of local anaesthetic. It is also important to consider the increased risks of causing central or peripheral nerve damage by re-injecting near to partially anaesthetised nerves. With this in mind it may be possible to provide adequate regional anaesthesia for surgery and postoperative analgesia.

It is important to balance the risks and benefits of the original planned regional block against an alternative technique using general anaesthesia with more localised regional blocks used just for postoperative analgesia. Where general anaesthesia is considered inappropriate because of patient co-morbidity it may be sensible to postpone surgery and seek more experienced help for a future attempt, if surgical conditions allow. Attempting to rescue a failed block may result in unacceptable risks where the surgical needs do not justify this.

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Abstract

Angotensin-converting enzyme inhibitors (ACEI) and the infulence of the fluid replacement during spinal anaesthesia

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Volume depletion and extended sympathetic blockade during spinal anaesthesia (SA) in ACEI treated patients, may result in reduced vascular capacitance, decreased venous return, reduced cardiac output and severe hypotension *(1, 2)*. Independent increase of norepinephrine and ACEI depended increase of vasopresin may be sufficient for inhibited renin-angiotensin compensation and the blood pressure regulation during SA *(3)*. The study investigates the influence of inter-operative fluid replacement on MAP regulation in ACEI treated patients 12 hours before SA.

Materials and methods: 237 patients (52–82 age, bough gender, ASA I–III status) scheduled for total (166; 71%) or partial hip replacement (68; 29%) under SA were included in the study. 150 were hypertonics (63%) and 87 (37%) normotonics (Group N). Thirty-six (24%) patients with AH were long-term treated with one of ACEI drug (Group ACEI), 34 (22%) with calcium channel blocker (Group CCB) and 22 (14%) had combination of ACEI and CCB (Group ACEI+CCB). All patients received 10 ml kg^{-1} of electrolyte solution 30 min before and 5 ml kg^{-1} h^{-1} during spinal anaesthesia. If the blood pressure fell below 20% of the MAP baseline usually colloid was added. MAP was recorded continually.

Results: Patients in ACEI group received significant higher inter-operative fluid replacement 1803+/–319 ml (CCB=1538+/–376, ACEI+CCB=1733+/–341, N=1628+/–390 ml (P=0.0419). 25% of that included colloids (CCB=14%, ACEI+CCB=13% and Group N=14%) and 71% crystalloids (1307+/–319 ml)(CCB=80%, 1064+/–363; ACEI+CCB=82%, 1273+/–335ml and Group N=83%, 1213+/–292 ml)(P=0.0492). The blood loss during surgery did not differ between groups (ACEI=17+/–7, CCB=11+/–9, ACEI+CCB=19+/–8 ml, N=17+/–22 ml/kg m^{-2})(P=0.2328). Maximal decrease of MAP in ACEI Group occurred 15 min after spinal anaesthesia (84+/–13 mmHg)(–20% from the MAP baseline)(Group CCB=94+/–11, –11%; ACEI+CCB=96+/–17 mmHg, –9% and N=95+/–13 mmHg, –7%) (P0.0003). Mean MAP during SA was equal in all groups (ACEI=99+/–13,–6%; CCB=94+/–9,–11%; ACEI+CCB=94+/–9,–12%, N=93+/–13 mmHg,–9% from the MAP baseline)(P=0.0507).

Conclusion(s): Colloid replacement in addition to crystalloids 1:3 improve good hemodynamic regulation in ACEI treated patients 12 hours before SA without the need of vasoconstrictor drugs during spinal anaesthesia.

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Abstract

Spinal and general anaesthesia, comorbidities and thromboprofylaxis for orthopedic hip and knee arthroplasty

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A retrospective research was performed on a sample of 207 patients who have undergone an orthopedic total hip(THA) or knee arthroplasty(TKA) at the Department of Orthopedic Surgery, General Hospital Slavonski Brod, during the year 2006.

Materials and Methods: A comparison between spinal (SPA) and general (GA) anaesthesia was made based on present comorbidities (myocardial infarction, angina pectoris, hypertension, chronic obstructive pulmonary disease, diabetes mellitus, insultus cerebrovascularis, dialysis and reumathoid arthritis), cost of anaesthesia, administration of analgesics and incidence of postoperative complications (bradycardia, hypotension, nausea/vomiting, headache, backache, urin retention and neurologic complications) during the first 24h. Thromboembolic prophylaxis was performed with low molecular weight heparin 12h before surgery. Premedication was performed with Midazolam i.m.0.1mg/kg of body weight. Strict protocols were applied for GA and SPA (which was performed with 0.5% bupivacain using either a 25G or 27G spinal needle).

Results: THA was performed on 108 patients, 50 using SPA and 58 using GA. TKA was performed on 99 patients, 70 using SPA and 29 using GA. Cost of anesthesia during surgery: THA using SPA–502kn (340–605), THA using GA–570kn (502–685). TKA using SPA–520kn (350–640), TKA using GA–750kn (590–920). Administration of analgesics during the first 24h after surgery: THA and TKA using SPA–Metamizol 5g(1.5–7.5) and Tramadol 100mg(50–150), THA and TKA using GA–Metamizol 5g(1.5–7.5) and Tramadol 200mg(75–300). Patient recovery after SPA was much better, with higher rate of patient satisfaction.

Conclusion: Based on the results of the research, significant advantage of SPA for orthopedic THA and TKA was confirmed.

Key words: spinal anaesthesia, general anaesthesia, analgesia, cost-benefit, complications

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Abstract

Assessment of pain intensity and patient satisfaction with analgesia after operative procedures in the musculoskeletal system

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Pain is an extremely unpleasant experience, which unites sensory and emotional components related to tissue damage *(1)*. Due to a large impact of pain on the speed of patient recovery and length of hospitalization, perioperative therapy of pain plays the key role.[2] Despite large progress in the assessment and treatment of postoperative pain, the results described in the relevant literature as well as those obtained in our patients are not always optimal *(3)*.

Aim of study: to assess the intensity of pain in the first 72 hours post surgery in the musculoskeletal system and to evaluate patient's satisfaction with analgesia.

Material and methods: a randomized study was conducted in 200 surgical patients. The Visual Analog Scale (VAS) was used to assess the intensity of pain measured at 6, 24, 48 and 72 hours after surgery *(4)*. A special interest was paid to spontaneous pain breakthrough appearing at any point of time during the 72-hour monitoring period. To evaluate the degree of patient's satisfaction with analgesia, patients were distributed into several categories *(5)*.

Results: Approximately 80% of patients had acute pain of medium or high intensity in the first 24 hours after surgery, with a slight reduction of pain intensity in the following 24 hours. Spontaneous pain breakthrough and procedural pain also appeared in the first 72 hours post surgery. Approximately 87% of patients were satisfied with analgesia.

Conclusion: Despite huge progress in the assessment of pain intensity as well as establishment of standards and guidelines for therapy of acute pain, a large number of patients still suffer from postoperative pain of varying intensity *(6, 7, 8, 9, 10, 11, 12)*. Unreduced pain can lead to various clinical and psychological changes that increase morbidity and mortality. Additional efforts are necessary in order to improve the therapy of postoperative pain in our surgical patients.

Key words: pain, postoperative pain, pain intensity assessment, patient satisfaction, analgesia, musculoskeletal system

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Abstract

Epidural analgesia in croatian obstetrics – advantages and disadvantages

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Introduction: Although labor epidural analgesia (LEA) is an efficient and safe method1 of pain relief, its influence on mother, newborn2 and mode of delivery3 is still being analyzed.

Objective: The analyses of delivery and neonatal outcome in LEA in University Hospital Split from October 1st 2004 till December 31st 2006.

Methods: Total number of deliveries in LEA, mode of delivery, intrapartal side effects (temperature, shivering, nausea, drowsiness, itching) and postpartal complications (urine retention, backache, headache, neurological fallouts) were analyzed retrospectively. Neonatal outcome was evaluated through APGAR scoring. Motor block was evaluated through Bromage scale (1– 4). Parturient satisfaction level was rated through 3 categories of VAS score (0–3= excellent, 4–6= satisfactory, 7–10= unsatisfactory). Statistical analysis was performed with $\chi 2$ test. ($p<0.05$).

Results: LEA was performed on 4,1% (389/9569) parturient. Instrumental delivery in parturient with LEA was 4,9%. Cesarean delivery rate was 9,76%. LEA didn't significantly increase the rate of Cesarean delivery (p=0,329). Side effects free were 81,23% of parturient. Increased body temperature was present in 2,6% of parturient. LEA had no effect on motor ability in 84,6% (329) of parturient. LEA was rated excellent by 76,1% (296) of parturient. Only 2 (0,5%) parturient complained on headache (unintentional dural puncture). APGAR score > 8 was in 92,6% of newborns. Only three newborns had APGAR score less than 5.

Conclusion: LEA is safe and efficient pain relief method, therefore permanent evaluation of results is compulsory to decrease the number of operative deliveries and side effects for parturient and newborn.

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PERIODICUM BIOLOGORUM
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Abstract

The effects of neuroaxial blockade on course and outcome of labor

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Background and purpose: The role of neuraxial analgesia on the course of labor and delivery has been extensively debated. It is exceedingly difficult to design a study that perfectly answers the question of whether neuraxial analgesia has an adverse effect on labor. Articles of current relevance to obstetric anesthesia practice will be presented.

Materials and methods: Study focused on the effects of labor analgesia on the duration of first and second stages of labor, and on rates of caesarean or instrumental vaginal delivery.

Results: Multiple approaches have been used to analyze this issue. Individual studies can randomly assign patients to receive neuraxial versus another form of labor analgesia (usually systemic opioids). [1, 2] Meta analyses are systemic reviews that compare multiple studies in order to gain analytical power.[3-5] Also an acute change in a particular institution can be analyzed, i.e. before and after epidural analgesia is available for parturients.[6, 7] Analgesia protocols varied widely; outcomes differed between studies.

Conclusions: Since there are so many protocols that provide epidural or spinal analgesia for labor and delivery, it is very difficult to compare studies. In general, it would appear that neuraxial blockade may slightly increase the duration of the first stage of labor, and prolongs the second stage of labor. It does not change rates of caesarean section, but may increase the rates of instrumental delivery. However, use of mixtures that combine very low amounts of local anesthetics with opioids would appear to minimize adverse effects of neuraxial analgesia on the course of labor.

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PERIODICUM BIOLOGORUM
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Abstract

Caudal blockade in children

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Background and Purpose: The caudal approach for epidural blockade remains the easiest and most useful technique for regional analgesia in children. Caudal analgesia has become a foundation in anesthesia for surgeries of the abdomen and lower extremities. The approach to the caudal block is relatively straightforward, which has led to its widespread use. However, there are several variations that affect the time and ease of placement. The purpose of this presentation will be to discuss several of these differences; additionally we will discuss the use of an indwelling catheter for prolonged use of caudal blockade.

Results: Most recent studies have focused on techniques for extending the duration of caudal blocks after single doses. We will present recent changes in dosing which may increase the effectiveness of the caudal block. These techniques have included altering the local anesthetic being used, especially as newer local anesthetics with lower toxicity have been introduced.

The addition of other medications to the local anesthetic can also have pronounced effects on the duration and side effects of the block. The two medications most studied have been ketamine and clonidine. Addition of either drug to a caudal using a local anesthetic prolongs the duration of the block. However, since a preservative-free preparation of ketamine is not widely available our discussion will focus on the use of clonidine.

Discussion: Complications associated with caudal block are rare; however as with any technique, the risks and benefits must be carefully considered on an individual basis.

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Combination of isobaric bupivacaine and fentanyl, versus isobaric bupivacaine in spinal anaesthesia for cesarean section

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Spinal anaesthesia is commonly, used for caesarean section and it become popular practice to add opioids to enhance and prolong interoperate and postoperative analgesia.

Materials and Methods: In this prospective randomised study, we separated the 30 term pregnant woman ASA 1 and 2 in two groups.

In one group (A) we give isobaric 0,5% bupivacaine (11 – 13 mg) depend from their height, and group (B) receive itrethecal isobaric 0,5% bupivacaine (10 – 12 mg) in combination with 20 Đig fentanyl. The time of sensory block seed to T4 dermatome was recorded tested with pinprick, and time of motor block after modified Bromage scale to Bromage 1 was recorded. Changes of blood pressure, pulls and saturation are recorded. After operation the time for full regression of motor and sensory block was recorded, such as time of first administration of supplemental analgesic.

Results: After given intrathecal single dose of anaesthetic in group A v.s. B, the time for motor block to Bromage 1 was 4–15 min. v.s group B 3–7 min..The time for sensory block speed to T4 was 4–10 min. v.s. 3–5 min.The blood pressure was decreased for 30 – 70 mmHg in group A v.s. 20 – 30 mmHg in group B, with no significant changes in pulls, and saturation in bought group.The time for first administration of supplemental analgesic postoperatively using VAS scale > 3, 4 in group A (80 – 210 min.) v.s. group B (165 – 270 min.)

Conclusion: Using a combination of isobaric bupivacaine and 20Đig fentanyl for spinal anaesthesia for C.S. gives an intraoperative good analgesia, homodynamic stability, longer postoperative analgesia and faster regression of motor block.

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PERIODICUM BIOLOGORUM
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Abstract

Bupivacaine vs. levobupivacaine in epidural analgesia during labor

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In this prospective, randomized, observer-blinded clinical trial, we compared the incidence of unwanted lower extremity motor blockade and the analgesic efficacy between epidural infusions of bupivacaine and levobupivacaine *(1)*.

Patients and methods: Following ethics committee and patient consent 60 parturients requesting epidural analgesia obtained an epidural catheter at L2/3 or L3/4. After 3 ml 2% lidocaine test dose patients were randomly allocated to one of two groups. In Group B bolus dose was 8 ml 0.25% bupivacaine plus 2 mcg fentanyl and after 45 minutes pump was started to run 10 ml 0.125% plus 2 mcg fentanyl. In Group L bolus dose was 8 ml 0.25% levobupivacaine plus 2 mcg fentanyl and after 45 minutes pump was started to run 10 ml 0.125% levobupivacaine plus 2 mcg fentanyl. Pain was assessed with visual analog scale (VAS) from 0 to100 mm. Motor strength was assessed with a four-point Bromage scale. Statistical analysis was based on the chi-square test for number of patients and unpaired Student's t-test for the parametric variables.

Results: Sixty women completed the study protocol (Group B=30, Group L=30). There were no significant differences between groups in patient characteristics or obstetric details. Satisfied analgesia (VASd«50) was similar between groups (Group B=25, Group L=23, p=0.518). The groups were statistically different in number of woman retaining full motor power, Bromage score 4, (Group B= 21, Group L=28, P=0.0195).

Conclusion: Levobupivacaine compared to bupivacaine in similar concentrations had less incidence of unwanted lower extremity blockade with the same analgesic efficacy.

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PERIODICUM BIOLOGORUM
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Abstract

Comparison of the effects of different methods of anesthesia on central hemodynamics during laparoscopic gynecologic operations

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Instability of central hemodynamics is one of important problems that need precise monitoring during laparoscopic gynecologic operations. The aim of this study was to compare this instability during surgical intervention under different methods of anesthesia.

Materials and methods: After local ethic committee approval, 58 patient awaiting different laparoscopic gynecologic operations were recruited for this randomized study. All patients were allocated into two groups. The patients of the first group (N = 29) were operated under general anesthesia (propofol and fentanyl). Epidural anesthesia (ropivacaine) was performed for patients of the second group (N = 29). Indices of cardiac functions (stroke volume, cardiac rate and circulation minute volume), arterial pressure (diastolic, systolic, mean pressure) and vascular parameters (diameter of artery, pulse-wave velocity, linear blood circulation, vascular potency, general peripheral vascular resistance) were monitored during the operation. We compared the variation of hemodynamic parameters during anesthesia in each group.

Results: The analysis of collected data showed that all registered parameters were within the range of physiologic norm during anesthesia in both groups but the variation of some hemodynamic parameters (diastolic, systolic, mean pressure, cardiac rate, circulation minute volume and general peripheral vascular resistance) in the group with epidural anesthesia was significantly lower ($p<0.05$).

Conclusions: Epidural anesthesia with ropivacaine for patients who underwent the surgical endoscopic gynecologic interventions produces minimal impact on hemodynamics. It can be considered as the reasonable method of anesthesia for these patients.

PERIODICUM BIOLOGORUM
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Abstract

Neostigmine adjuvant in spinal anesthesia

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Besides the improvement in finding solutions for postoperative pain relief, still the number of patients who suffer in postoperative period it s not small, probbably the consequence of the fact that ideal analgesic drug without nonwanted effects does not exist. In the therapeutical spectra of analgesics, Neostigmin given intratectally must be considered, which allows efficiency and long-lasting pain cantroll.

Material and Methods: In the period of 6 months, in 60 patients following surgical interventions were done: vaginal hysterectomy and TUR prostatae. The patients were from 54–83 years old, 18 women and 42 men, ASA grade 2–3. All were under spinal anaesthesia on the level L3–L4, and 0,5% Bupivacaine in dose of 2,0–2,8 ml as a local anaesthetic was used. The patients were divieded in two by number identical groups, the first group was given only local anaesthetic whereas the second one was given 20 mgr Neostigmine besides the local anaesthetic. The monitoring of pain continuous in between the time of intratectal application of drugs until the presence of the first pain.

Results: The lasting time from anaesthesia in the second group which was given a supplemental dose of 20 mgr Neostigmine besides the local anaesthetic was obviously prolonged, compared to the first group without Neostigmine.

Conclusion: Intrathecally given Neostigmine obviously increase the lasting time of postoperative analgesia.

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Abstract

Levobupivacaine spinal anesthesia for hip surgery

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Levobupivacaine is a new local anesthetic and has been recently introduced into clinical prctice of Klinika za ortopediju Lovran because of its lower toxic effects for heart and central nervous system. In the world effects of levobupivacaine spinal anesthesia has been already investigated for Caesarean section, but in the hip surgery more has to be known regarding its characteristics. The aim of our study is to show spinal levobupivacaine anesthesia in hip surgery in 90 patients operated in the spring 2006.

Materials and methods: 61 women i 29 man was standardly received intrathecal levobupivacaine. Vital parameters, i.v. anesthetics and vasopresors were recorded as well.

Results: 6 patients received supplemental intravenous anesthesia for the leg movement during the operation, and 3 for the pain feeling at the end of operation.

Conclusions: Levobupivacaine showed less intense motor block and short duration to our previous experience for hip surgery. Further and larger comparative studies are needed in order to assess if levobupivacaine is preferable to bupivacaine for hip surgery, also regarding the tonus of sceletal muscles.

Key words: levobupivacaine, spinal, orthopaedic

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PERIODICUM BIOLOGORUM
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Abstract

Combination of general and regional anesthesia in abdominal aortic surgery

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Reconstructive surgery of abdominal aorta is very traumatic one. It require very safe anesthetic management. Aim of study was to compare different anesthesia methods in abdominal aorta surgery

Materials and Methods: 62 patients have been operated on – aortobifermoral bypass was made. Mean age was 57,7±4,5 years. All patients were divided into 2 groups: group 1 (n=30) operated in condition of thoracic epidural block (0,5% Marcain) with myorelaxation and artificial ventilation(O_2:N_2O) and permanent infusion of Propofol. Group 2 group (n=32) operated in same condition but instead Propofol anesthesia with Sevoflurane (1.2 MAC) was used.

During operation monitoring of AP, CVP, level of Hb, Ht, SaO2, ECG was performed. Mean operation time was 4,5±0,5 hours. Blood loss volume in both groups was the same – 600±70 ml(measured by gravimetric method). After operation prolonged anesthesia by 0,2% Naropin during 2 days was used.

Results: Patients in group 1 had more expressed hemodynamic instability as compared to group 2; hypotension that required increase of volume infusion and Dopamin dosage. Mean infusion volume in 1 group was 8700±450 ml and in 2 group 6800±500 ml. Diuresis during operation in both groups was 50 ml/h. Blood transfusion was given to all pts in group 1 and only in 9 pts in group 2. Extubation in all pts of 2 group was made immediately after operation and in 50% of pts of group 1 in postoperative care unit.

Conclusions: Obtained data showed more stable hemodynamics in patients operated on abdominal aorta by using Sevofluran as compared with Propofol.

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Abstract

Effect of triamcinolone on prolongation of ropivacaine effect in nerve block

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For postoperative pain control, single shot nerve block is relatively short duration. We investigated that whether triamcinolone could prolong or impove the duration of nerve block in children.

Materials and methods: Forty children (4–15 year old) were recruited who got head surgeries. Randomly allocated into two groups; nerve block with levobupivacaine (group L, n = 20), nerve block with levobupivacaine and triamcinolone (group T, n = 20) for postoperative pain control. After surgery, the patients received supratrochlear, supraorbital and auriculotemporal nerve block. At each site, 0.1ml/kg (up to 3 ml) of 0.25% levobupivacaine in group L and same concentration of levobupivacaine with 1 ug/ml triamcinolone in group T. Pain was evaluated with visual analog scale in recovery room, 8 hr, and 24hr. Interval from nerve block to first pain complain was recorded.

Results : At recovery room, mean VAS was lower in group T (0.31 ± 0.71 in group T, 2.5 ± 1.2 in group L, $P < 0.05$). VAS increased in 8 hr and VAS decreased in 24 hr in both groups.

Conclusions: Nerve block with levobupivacaine adding triamcinolone improved the quality of pain control but did not prolong the duration of local anesthetics.

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Abstract

Optimal angle of needle insertion for caudal block in adults

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This study was conducted to investigate the optimal angle of needle insertion during caudal epidural injection in chronic low back pain patients using ultrasound imaging.

Material and Methods: 108 patients(40 male and 68 female patients) with low back pain and sciatica were studied. Soft tissue ultrasonography was performed to locate the sacral hiatus. The optimal angle of the needle to the skin was measured with an imaginary line drawn parallel to the sacral base using a protractor on a longitudinal plane. A 22-gauge caudal epidural needle was inserted and guided by ultrasound to the sacral hiatus and into the caudal epidural space.

Results: The mean values (SD) for the intercornual distance, depth of the caudal space and the thickness of the sacrococcygeal ligament were 18.96(3.21) mm, 3.64(0.89) mm, 1.83 (0.82) mm, respectively. The optimal angle showed significant correlations with the depth of the caudal space and the thickness of the sacrococcygeal ligament. The mean value (SD) for the optimal angle of the needle was 23.52 (6.93)°.

Conclusions: We conclude that the needle should be inserted at an angle of approximately 23 to the skin in order to avoid injury to the periosteum and inadvertent intra-osseous injection.

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Abstract

General and caudal anaesthesia in children during appendectomies

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Single-shot caudal epidural blockade is one of the most widespread techniques to provide intra and postoperative analgesia in paediatric patients. The aim of this study is to evaluate the duration of postoperative analgesia after caudal blocks in children with different concentrations of bupivacaine during emergent appendectomies.

Materials and Methods: The 84 children (ASA I–II, 1–9 years old), undergoing appendectomies were enrolled in study. Induction of general anaesthesia is performed using oxygen, N2O, and halothane, without using opioids. The airway was secured by tracheal intubations. After identifying the sacral hiatus, the caudal space is entered using a short (1-inch), 20-gauge needle that has been attached to a labelled syringe containing the solution of 0.125% bupivacaine in volume 1ml/kg (group I, n=47) and 0.20% bupivacaine, 1ml/kg (group II, n=37). Continual monitoring of vital signs, observational paediatric pain score (OPS), modified Bromage scale and postoperative sedation were assessed.

Results: Patients characteristics were similar, as well as surgical time. Analgesics were needed after 662±395 min in the first group (lower concentration) and 887±607 min (higher concentration) in the second group ($p<0.05$). Motor block was less in the first group ($p<0.05$). Emergency agitation was present only in two cases, in both groups. Urine incontinence was present in 17 (45.9%) children in second group and only in 3 cases (6.4%) in first group.

Conclusion: In children undergoing appendectomies caudal block with 0.125% bupivacaine in volume 1ml/kg produced shorter analgesic effect, but without motor block, muscle weakness and the other side effects.

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Abstract

Incisional local anaesthesia with tramadol versus bupivacain or pain relief after pediatric minor surgery

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Background and purpose:To compare postoperative analgesic effects of wound instillation with tramadol versus bupivacaine after minor pediatric surgery.

Materials and methods: This study include 20 children, ASA status I or II, aged 5 to 12 years, undergoing minor surgery (herniotomy,appendectomy etc.) divided in two groups. Before wound closure, the trial medicine instilled and remained in the wound for 30 seconds.Group 1.recieved 2 mg/kg trmadol in 0,5ml/kg saline and Group2. recieved 0,5 ml/kg 0,25% bupivacaine subcutaneously. Requirement of analgesics was measured within the next 24 hours (first,fourth, twelfth and 24th hours) according self-reports of pain intensity, faces scales and visualanalogue scales.

Results: The pain scores were higher in Group 2 for the first twelve hours with no difference later. Average time to first analgesic was longer in Group1 (forth hour vs. first in Group2). No side effects were recorded.

Conclusions: Wound instillation with tramadol is probably better analgesic method vs. bupivacaine.The use of subcutaneous tramadol reduces postoperative requirements ofanalgesics more than bupivacain during the first 24 hours.

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Abstract

Postoperative pain- comparison of two surgical techniques

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Laparoscopic surgery has proven to reduce postoperative pain significantly and thus allow a shortened hospital stay and recovery period, which is reflected in the patients earlier return to normal life and work activities. Although postoperative pain has been reduced significantly since they advent of laparoscopy, surgery patients still complain of moderate abdominal and shoulder pain during the first 48h.

The aim: and purpose of the survey was to compare pain intensity and the need of analgetics in the postoperative period during the first 48h for patients who have had laparoscopic and conventional surgery.

Patients: 120 patients were included in the study diagnosed with extrauterine pregnancy aged 22–39. The patients were randomly assigned to two groups, group A consisting of 60 patients who have had laparoscopic surgery and group B consisting of 60 patients who were operated with conventional surgical methods. All of the patients who took part in the study had ASA I–II, balanced NLA and controlled ventilation.

Postoperative pain was evaluated in terms of intensity and location with a numerical verbal scale. Quantative analysis of pain was determined by the dose and schedule of analgesia required in the first 48 h after surgery.

The results: of the group with conventional surgery showed a considerable reduction of postoperative pain during the first 48 h after laparoscopic surgery in regards to the need for analgetics and the pain intensity.

Quantitative analysis of the amount of analgesia required by the patients also showed a significant difference between group A and group B respectively.

Conclusion: In spite of those procedures being »minimally invasive« there is often postoperative pain following laparoscopy but with a significantly reduced intensity in regards to postoperative pain after conventional surgical interventions.

PERIODICUM BIOLOGORUM
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Abstract

Hemodynamic effects of bupivacaine vs. levobupivacaine in spinal anaesthesia for hypertensive urologic patients undergoing transuretheral surgery

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Aging and hypertension may make elderly patients particularly suspectable to hypotension during spinal anesthesia. In this study we compared haemodynamic responses of levobupivacaine and bupivacaine in spinal anaesthesia.

Materials and methods: Anaesthetic charts of 114 ASA III–IV patients (49 – 93 yrs of age) undergoing transurethral surgery under spinal anesthesia were reviewed for arterial blood pressure and heart rate continuously. In this prospective, double blind study assigned to the patients were randomized to four groups according to the preoperative systolic blood pressure (SBP). Anaesthesia: Standardized spinal anaesthesia with 15mg (3.0ml) of 0.5% isobaric local anaesthetic bupivacaine or levobupivacaine at puncture site L3/4 or L4/5 was performed by the same anaesthesiologist. Analysis of hemodynamics: baseline SBP and HR before SPA, decrease SBP and HR after SPA and percentage decrease of SBP and HR (SBP-%, HR-%). Statistics: mean ± SD, two-way ANOVA

Results: The main age did not differ. 59/114 (52%) were hypertensive. Both levobupivacaine and bupivacaine produced a significant decrease in SBP when compared to patient baseline values. SBP parameters differed significantly between bupivacaine and levobupivacaine in normotensive patients. ($P < 0{,}001$). Levobupivacaine 0.5% produced significantly less hypotensive episodes then bupivacaine 0.5%. Levobupivacaine 0.5% produced decrease in BP in both hypertensive (16.33%) and normotensive patients (8%) vs. bupivacaine 0.5% which produced decrease in BP in hypertensive (20.26%) and normotensive patients (8%).

Conclusion: At elderly patients undergoing TUR, levobupivacaine rovides less episodes of hypotension compared with bupivacaine in hypertensive and normotensive patients.

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Abstract

Preemptive analgesia with midazolam and diclofenac for hernia repair pain

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Midazolam has antinociceptive effects when administered intrathecally, while its effects associated with systemic administration remain controversial *(1)*. The aim of this study is to compare the preemptive effects of systematically midazolam and diclofenac on postoperative analgesia when used 15 minutes before surgical incision.

Material and Method: 90 patients, ASA graded I–II, aged 18–65 year old, scheduled for hernia repair surgery, which refused spinal anaesthesia, was included in the study. Anaesthesia induction was done with propofol and atracrium. After intubation general anaesthesia was maintained with continual infusion of propofol, fentanyl and 66% N2O on O2. 45 patients received midazolam 0.15 mg/kg and diclofenac 1 mg/kg (Midazolam group) 15 min before surgical incision and 45 of them received diclofenac without midazolam (Diclofenac group) 15 min before surgical incision. After full recovery from anaesthesia, pain scores were evaluated. Pain scores (VRS-5) and four-point sedation scores were recorded 15, 30, 60, 120, and 180 min after surgical intervention.

Results: VRS-5 pain scores of the Midazolam Group were lower than those of the Diclofenac Group ($p < 0.05$). Analgesia requirement in Diclofenac Group was increased 30 min after full recovery. The sedation scores of Midazolam Group were significantly higher than those of the Diclofenac Group.

Conclusion: Midazolam enhance postoperative analgesic effect of diclofenac when used before the onset of noxious stimuli. However, clear demonstrations of this hypothesis have yet to be made.

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PERIODICUM BIOLOGORUM
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Abstract

Osteoporotic pain and transdermal buprenorfine-transtec case report

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This article presents a case of a 68-year old female patient, housewife. She had severe pains in the whole body, specially in low extremities. The diagnoses were: severe osteoporosis, coxarthroses and gonartroses. Before two years she suddenly suffered severe back pain. X-ray exam showed compressive fracture of Th 11, Th 12, L 1 and L 2. A surgical treatment was not indicated, and conservative treatment consisting of alendronate, calcium, ortosis for spine and tramadol hidroclorid 300–400 mg daily. When she presented to our pain specialist she reported VAS 10. She was badly mobile, could not sleep and had very poor physical and psychical status. She was prescribed transdermal buprenorfine (Transtec). After two weeks on controll examination she reported VAS 3, started physical therapy and she was mobile by stick.

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Abstract

Effectiveness of stellate ganglion block on chronic headache

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Because the etiologic mechanism of chronic headache are not yet fully explained, the treatment is not simple and difficult. Chronic headache imposes considerable burdens on sufferer and society as well. Although stellate ganglion block (SGB) could be used for the treatment of chronic headache, we evaluated and compared the effectiveness of SGB in treating chronic tension headache and migraine patients on pain alleviation and improving the quality of life after treatment.

Methods: Patients who experienced headache for more than 4 hours a day and 15 days a month were diagnosed as chronic headache and 46 subjects were enrolled in this study which were approved from University IRB. The patients were randomly classified into migraine group (MG, n=26) and tension headache group (TG, n=20). The patients of both groups were treated with only SGB twice a week for 8 weeks and evaluated effectiveness after treatments, and follow up 4 weeks after treatment. The effectiveness of these treatments was analyzed using Visual Analogue Scale (VAS) pain scores and Brief Pain Inventory (BPI).

Results: The VAS and BPI after 8 weeks of treatment showed significant differences compared with those of MG and TG before treatment and there were no differences between two groups. The VAS and BPI of 4 weeks after the end of treatment, showed also significant improvement compared with those before treatment in both groups.

Conclusions: The above results suggested that SGB might be useful modality for improving the pain and quality of life in both TG and MG patients.

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Abstract

Neurocognitive function after carotid endarterectomy (CEA) under regional and general anesthesia

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Objectives: CEA is an effective method of stroke prevention in patients with symptomatic carotid stenosis, but the occurrence of subclinical neurocognitive deficits is usually not investigated, and their relation to the type of anaesthesia is unknown.

Design: Neuropsychometric investigation was performed in a group of patients who underwent CEA under superficial cervical block and compared with results of patients under general anaesthesia.

Method: 22 patients were operated under superficial cervical block and 19 under general anesthesia. Patient was tested two times: a day before carotid surgery and 24 hours after surgery. Applied psychometric tests included: Ravens Progressive Matrices, verbal fluency, number recollection forwards and backwards, and perceptive velocity.

Results: The groups did not differ in demographic data, education and general cognitive ability. The results of psychometric tests did not show any difference between the groups related to the type of anaesthesia, but differences were found in relation to the time of testing. Verbal fluency and number recollection forwards were better after surgery, which indicates improvement in attention, but not in effective memory. The effect is probably due to lower anxiety after surgery. In contrast to this finding, number recollection backwards, which is an indicator of working memory, was not changed. Test of perceptive velocity was worse after surgery in the both groups, probably due to intraoperative hypoperfusion.

Conclusions: Neurocognitive function changes after CEA were not related to the anaesthesiological technique, but to other factors, such as the change of emotional status after operation or hypoperfusion phenomena during operation.

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Abstract

Postdural puncture headache

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A case of double dural puncture made in an attempt of placing epidural catheter for labor analgesia is described. After developing clinical picture characteristic of postpdural puncture syndrom with dominant neurological symptoms, patient refused epidural blood patch. Dominant symptoms were headache, neck stiffness, tinnitus, vertigo, paraesthesiae of right arm and inability to maintain upright position. Neurological symptoms were treated conservatively with bed rest, good hydration, coffein containing drinks, and analgesics. The first attempt of ambulation finished as a colaps. The first sign of improvement occurred on the seventh day after dural punction, the complete resolution of symptoms appeared after ten days which is in corelation with the time necessary for dural healing. Sequelae after postdural puncture can persist for several months afterwards. Despite the recommended treatment with blood patch, this case of double dural puncture finished with complete resolution of symptoms treated only conservatively. Pathofisiology and follow-up of cases of postdural puncture headache remain a challenge for anesthesiologists.

Key words: postdural punction headache, neurological complications

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Abstract

Opioids in severe chronic pain

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Opioids are accepted as the main drugs for pain alleviating in the pain treatment in patients with advanced malignant deseases. However, the treatment of chronic nonmalignant pain is still controversial. In various severe nonmalignant diseases sometime is neccessary to use opiates when other analgesic drugas were proven as unefficient and suffering is still present.

The use of opiates solves descendent control of pain transmission, but side effects and possible addiction occasionally limit their use. This paper analyses experience in patients treated with oxycodone cloride at Pain Clinic Rebro during the last six months.

Patients and methods: The patients sufferring from different malignant deseases or some severe chronic nonmalignant deseases underwent to oxycodone therapy.

Malignant diagnoses were: large bowel cancer *(1),* multriple osseal sarcoma *(1),* tumor of spinal region *(2),* ovarial cancer with abdominal metastases *(1),* and suprarenal gland tumor *(1).* Nonmalignant diagnoses were postherpetic intercostal neuralgia *(2),* severe bilateral gonarthrosis scheduled for knee arthroplasty *(1),* multiple vertebral fractures in patients with severe osteoporosis *(3).* 4 men and 8 women, mean age 65 years were analysed. Preoperative pain was intensity as measured by VAS scale was 9–10.

Results: The therapy commenced with 2 × 10 mg daily (every 12 hours), up to max. 2 × 40 mg. Antiemetic metoclopramid was given in dose 3 × 1o mg due to nausea and vomiting which appear in 30% of patients.

The pain intensity (VAS) decreased from 9–1o to 2/3 after Oxycontin therapy started. Side effects observed in our patients were dizziness, nausea and obstipation. The patient with gonarthrosis received that therapy until the knee operation. The patients suffering from spine fracture pain used also Fossamax R or Forteo injection s.c. and had toracal corset.

Conclusion: In severe nonmalignant pain use of opiates may be reccomended and beneficial. Side effects could be minimized with use of antiemetics, which are commonly used by patients suffering from malignant deseases. In dealing with nonmalignant pain ammount of medicines has to be gradually lessened during the recovery phase of disease.

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Abstract

Postoperative intrathecal analgesia for primary total hip arthroplasty – comparative clinical examination of two different small doses of morphium hydrochloride

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The aim of this study was to prospectively compare the spinal analgesia with two different small doses of morphium hydrochloride after primary total hip arthroplasty.

Background: In total hip arthroplasty several techniques for postoperative analgesia can be used. In this study, we examined analgesia and side effects of intrathecal morphium hydrochloride (MCh) after primary total hip arthroplasty in the following two small doses: 0.05 mg and 0.1 mg.

Methods: Forty patients were randomised to receive either 0.5 ml/0.05 mg, or 0.5 ml/0.1 mg of MCh intrathecaly together with 3.5 ml, 0.5% isobaric bupivacine hydrochloride. The duration of postoperative analgesia, the intensity of the initial pain sensation and the frequency of opioid side effects were recorded for the first 24 hours.

Results: The mean duration of analgesia in the group M 0.05 was 14.3 ± 1.1 hours and was significantly shorter than 19.7 ± 1.7 hours in the M 0.1 group ($p<0.05$). Visual analogue scale (VAS) score for the initial pain intensity in the M 0.05 group was 5 (central value), and 3 (mean value) in the M 0.1 group. The difference was not significant ($p<0.05$). There was no respiratory depression in any group. The difference in the frequency of nausea and vomiting was not significant, but that in the frequency of itching was ($p<0.05$).

Conclusion: Intrathecal usage of 0.05 mg and 0.1 mg of MCh provides long lasting postoperative analgesia. It is a practical method for providing it after primary total hip arthroplasty. The efficacy of 0.1 mg of MCh is greater compared to that of 0.05 mg of MCh. These doses of MCh does not cause respiratory depression, but cause nausea, vomiting and itching.

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