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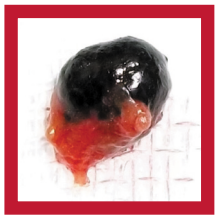

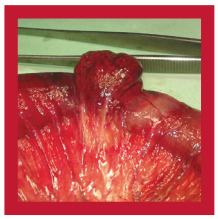

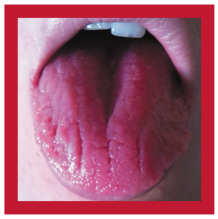

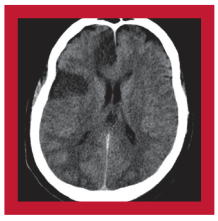

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Content

Editor's Letter

Dear Colleagues,

Scripta Medica is a journal of the Medical Society of the Republic of Srpska which aims to become educational magazine available to any doctor in the Republic of Srpska, Bosnia and beyond. Scripta Medica is the journal in which you will find ideas for your research and answers to some questions. Therefore, in the next issue, we intend to publish review papers by experts, i.e. eminent specialists in specific fields.

Reports on scientific results provide faster and easier adoption and propagation of scientific ideas, making them available to the general scientific community. Scientific production is expressed through reports about results in periodical scientific journals which, with their regular appearance and circulation, provide the most reliable options of introduction to scientific research and its results.

The special mechanism of quotation is used in propagation and adoption of research results, which refers to the implemented research, data source, obtained results, the author / s, etc. The scientific community divides quotations into three groups:

1. hetero-citations. i.e. real quotations - in which authors cite other authors,

2. auto-citations, in which the authors cite their previous work and

3. co - citations - in which authors cite other authors with whom they have written some earlier papers.

The basis for the analysis of the structure of quotation and the determination of appropriate indicators are so-called quotation databases. They collect bibliographic data on periodicals and appended lists of references with the appropriate database. This allows you to find not only publications cited in specific papers in these journals but papers that they have cited as well. Afterwards, the corresponding indicators that are used more widely are based upon them. Quotation of literature is a method of referencing the used documents or publication by using bibliographic elements: author / s, title, name and numeric data of magazines, city, publisher and year of publication. It is mandatory for the data on the quoted unit (reference) to appear twice –firstly in the text, and secondly in the bibliography. In the text, references are marked with Arabic numbers starting with 1, and bibliography, they are entered in the order in which they appear in the text.

Quotation of the scientific and technical papers serves the reader to become familiar with the sources that the author used when writing his papers. It is simple, fast, efficient and totally reliable way to find a magazine of the quoted content for your research. Quotation shows that we are not alone in a scientific research. Fundamental postulate that we must respect in citing implies that there needs to be a clear distinction where do the attitudes of the author himself end, and where the disclosure of other people's opinions starts. Otherwise, there is a possibility that the author is faced with intellectual dishonesty charges and appropriation of someone else's copyright work, piracy, plagiarism. etc. Nowadays, it is easy to detect plagiarism with the usage of widely available softwares, such as http://www.plagtracker.com/, Google and Yahoo search engines.

Nonstandard cases all over the world, with magazines written and then erased from the SCI lists, have forced us to think of where to publish our papers. There has been an emersion of the so-called predatory magazines that present a range of tempting offers, with alleged "excellent" impact factor, rapid publication and "24-72 hours" review. All this is available for a "minimum" payment of 900-1500 USD.

What is happening to scientific magazines today?

This is the case with magazines with reputable names, very similar or even exactly the same as the famous magazines that actually exist, but solely on the Internet and are not found published anywhere. They don't have a support of any significant impact factor, certainly not a licensed publisher, and peer review generally does not exist. The problem is that sometimes more publishers publish a magazine under the same name. Thus, for example, Journal of Hypertension has seven publishers and often creates confusion among authors.

Publishers of "predatory" magazines do not apply review process adequately, and hence, they acquire a huge profit. With the payment of prescribed amount of money being the only criteria for publication, their profitable activity has highly negative impact on the evaluation system of scientific research, as in "predatory" magazines the result of scrupulously executed research and compilation of general knowledge or trivial findings are treated in the same manner. Therefore, the publication in these kinds of journals can have a very negative impact on the careers of young researchers.

The Board at the University of Belgrade has given a number of recommendations to their teachers, researchers, collaborators, and students, regarding the preparation for publication of the results of their scientific research. They

are advised to check the integrity of professional journals in which they plan to publish their paper. The most precise criteria for the recognition of "predatory" magazines and publishers was given by Jeffrey Beall, a librarian at the University of Colorado with a long-term engagement in collecting and analyzing data in these journals and publishers. He publishes current information regarding the subject on his blog: http://scholarlyoa.com.

We invite you to write your papers for Scripta Medica following the Instructions for authors, and, if needed, the editorial board and reviewers will encourage you and assist in making your text fully acceptable for the criteria of Scripta Medica. On the other hand, you are expected to give us suggestions to improve the magazine.

We invite all heads of departments of medical schools and all presidents of the specialists association to give us suggestions for an extended list of reviewers for all scientific fields. Scripta Medica is both your and our magazine, and we must do everything to make it even better.

Editor of Scripta Medica
Doc. Milka Mavija

ORIGINAL ARTICLE

UDK 616.381-003.217-085

Comparison Of Abdominal Puncture And Diuretics During Ascites Treatment

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ABSTRACT:

Introduction

In clinical practice, ascites treatment is, in majority of cases, unsatisfactory and followed by multiple complications. During the therapy, some side effects,in relation to therapeutic method, may occur. The aim of the study was to compare the level of tolerance and effectiveness of ascites therapy in applying abdominal puncture versus diuretics between two groups of patients to establish connection and differences in applied treatments.

Patients and methods. There were 60 patients examined with ascites 3+ and 4+ divided into two equal groups. First group was treated by abdominal puncture several times a week while patients in the other group were administered diuretics either monotherapeutically or in combination. Majority of patients (86.7%) experienced no side effects after applied therapeutic protocol. 6,7% of patients experienced abdominal pain, 3.3% of them had cramps, ailment 1.7% and nausea 1.7% with no statistic difference between two groups of patients (p>0.05). Registered side effects were mild (5%) to moderate (8.3%), while only 1.7% of patients treated by abdominal puncture experienced leaking of ascitic fluid at the puncture site.

Conclusion. No major statistic difference between groups of patients was recorded in relation to side effects and complications in applied ascites therapy (p>0.05). Abdominal puncture and diuretics were both equally well tolerated in hospital conditions. Potential risk in ascites therapy can be reduced to the smallest possible extent by intensive observation of the patient.

Key words: ascites, abdominal puncture, diuretics, effectiveness of therapy

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Introduction

Ascites is considered to be a pathological state where fluid is accumulated in the free abdominal cavity effectuated by various factors. Its constitution may differ depending on the etiology, i.e. the cause of its development. Regardless of its causes, ascites is prevalent world-wide while its incidence marks a significant rise.[1,2] Etiology of ascites may be classified into conditions in which peritoneum has not been directly affected and those in which it has been affected by pathological process. In most cases (90%), causes of ascites are liver cirrhosis, malignoma, congestive cardiac insufficiency and tuberculosis.[3] According to available scientific sources, 80% patients with ascites in the USA have liver cirrhosis. Malignant disease effectuates less than 10% of ascites causes. Cardiac insufficiency is responsible for less than 5% ascites cases. Ascites may be classified by

its size using the following system: 1+, detected by careful examination only; 2+, easily detected, but is of relatively small volume; 3+, apparent ascites, while not tense; 4+, tense ascites.

The ascites therapy in clinical practice appears to be unsatisfactory in most of cases and it is often followed by numerous complications.[4,5] The common therapy protocol implies bed rest, sodium uptake restriction as well as diuretics, either individually or in combination thereof. After prolonged application of this medication and poor therapeutic response to it, we choose to apply abdominal puncture. Prolonged use of diuretics implies risk of occurrence of hepatorenal syndrome as well as electrolyte imbalance. Nevertheless, uncontrolled abdominal puncture includes plenty of risks such as infection, renal insufficiency and encephalopathy. Numerous and different problems may arise in ascites therapy. Therefore, controversial attitudes towards comparative advantages and disadvantages of ascites therapy are present.[6,7]

The objective of this study is to make comparison in clinical conditions between the level of tolerance and effectiveness of ascites therapy through application of abdominal puncture against diuretics in two groups of patients, in order to establish advantages and risks between the applied therapies.

Patients and methods

The clinical tests were performed within the Department of Gastroenterology of the Clinic of Internal Medicine at the University Clinical Center of Banja Luka. The study sample constituted of a group of patients, formed on prospective principle, who were admitted for treatment due to evident ascites in stage 3+ or 4+ accompanied with significant clinical symptoms. 60 patients, who were divided into two identical groups, were tested. The first group of patients (30 patients) was treated with abdominal puncture several times a week up to the point of disappearance of ascites, while the second group (30 patients) was treated with combined application of diuretics.

Immediately upon admission, blood was taken for complete blood count; a detailed physical examination was performed, as well as ultrasonography and esophagogastroduodenoscopy. Definitive diagnosis of ascites was based on diagnostic abdominal puncture.

The examination protocol was used as the basic methodological instrument having provided data necessary for the clinical tests. All subjective discomforts related to the tests were recorded. Therapy tolerability and effect of therapeutic protocol was observed. Statistical data analysis was made through application of SPSS for Windows 15, 0 program (Chi-sqare test, Student's *t*-test), while results were presented in tabular and graphical form.

Results

60 patients with ascites were tested. Among the examinees, there were 45 men (75%) and 15 women (25%). The average age of the patients was 56,6 years. In the group of patients who were treated with abdominal puncture, 22 were men (36, 7%), while in the group of patients treated with diuretics, there were 23 men (38, 3%). In the group of patients who were treated with abdominal puncture, 8 were women (13, 3%), while in the group of patients treated with diuretics, there were 7 women (11, 7%). No statistically significant difference was established between patients with regard to the distinction between the two groups defined by sex (p>0,05). The average age of the patients in the group treated with abdominal puncture was 59, while in the group of patients treated with diuretics, it was 58, 3.

Diagnosis of liver cirrhosis was verified as the cause of ascites in almost 88, 3% of cases, while malignant disease was the cause of ascites in 11,7% of cases. In the group of patients treated with abdominal puncture, 24 examinees (40%) had ascites of cirrhosis genesis, while 29 examines (48,4%) from the group treated with diuretics had liver cirrhosis as the primary diagnosis of disease. In the group of patients treated with abdominal puncture, 6 examinees (10 %) had ascites of malignant genesis, while malignant disease was the cause of ascites in 1 examinee (1,7%). Statistically significant difference between the two groups of patients was established in relation to the cause of ascites (p>0,05). The difference is seen in the fact that, in the group of patients treated with diuretics, there was a greater number of examinees with liver cirrhosis as the cause of ascites. Furthermore, in the group of patients treated with abdominal puncture, a greater number of examinees was the one with ascites of malignant genesis.

Table 1. Distribution of patients regarding discomfort during therapy.

Discomfort during therapy		Group		Total
		Punctured	Th.with diuretics	
No discomfort	N	27	25	52
	%	45.0%	41.7%	86.7%
Abdominal pain	N	3	1	4
	%	5.0%	1.7%	6.7%
Cramps	N	0	2	2
	%	.0%	3.3%	3.3%
Weakness	N	0	1	1
	%	.0%	1.7%	1.7%
Nausea	N	0	1	1
	%	.0%	1.7%	1.7%
Total	N	30	30	60
	%	50.0%	50.0%	100.0%

The largest percentage of patients underwent the therapy protocol with no discomfort (86,7%), 6,7% patients complained of having abdominal pain, 3,3% patients had leg cramps, weakness was present in 1,7% patients, and 1,7% patients complained of nausea. Table 1. demonstrates no statistically significant difference between groups of patients regarding discomfort arising during the ascites therapy (p>0,05).

The degree of discomfort described above was classified as mild to moderate. Out of the total number of examinees, 5% patients classified their discomfort as mild. Moderate discomfort was present in 8% patients, while leakage at the place of puncture was present in 2% patients. The listed discomfort, related to the applied therapy in groups of examined patients, did not require disruption of therapy or their exclusion from the study. The therapy tolerability was very good in 68% patients, it was good in 29% patients, while 3% showed poor tolerance for the applied ascites therapy. Figure 1. shows no statistically significant difference between the groups of patients (p>0,05).

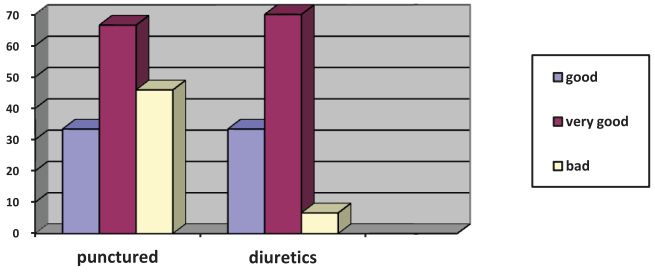

Figure 1. Patients according to their tolerance of the therapy

The effect of the applied ascites therapy was excellent in 33% patients, good in 52%, while in 15% patients, the effect of ascites therapy was assessed as unsatisfactory. The study demonstrated there was a statistically significant difference (p<0,05) between the groups of patients in relation to the arising therapy effects (Figure 2.).

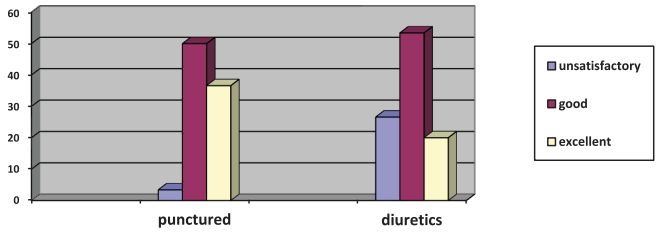

Figure 2. Patients according to the therapy effects

The global assessment of effectiveness of the applied therapy was far better for the group of patients treated with abdominal puncture. 21, 7% patients from the punctured group were assessed to have demonstrated excellent global effectiveness, which showed significantly larger frequency than in the group of patients treated with diuretics. The groups differed in the category of weak effectiveness as well. More frequently, weak effectiveness of the applied therapy was registered in the group of patients treated with diuretics.

Discussion

Different etiological factors may cause ascites and its incidence may vary depending on the hospital, probably reflecting different population exposure to many agents that lead to the emergence of ascites. Considerable misunderstanding of the severity of the clinical condition is present, so ascites is still being diagnosed and treated by different criteria.

Out of the total number of patients examined, men were predominantly represented while the average age of the patients was 59. Available data in scientific literature confirm predominance of male sex and older age in patients with ascites.[8]

Ascites may be caused by the variety of diseases. However, the study undoubtedly demonstrated predominance of liver cirrhosis as the cause of the disease.[9]

In 88,3% of the examined cases, ascites was caused by liver cirrhosis. The study undoubtedly demonstrated the liver cirrhosis as the dominant cause for ascites emergence. The results of the research are in accordance with the available literature data.[10]

Malignant disease is unordinary cause for the ascites emergence, but most of the patients with the ascites related to malignity live only for a few weeks or months after the start of the emersion. In patients with long history of stable cirrhosis and subsequent development of ascites, the probability for the development of hepatocellular carcinoma in the place of liver cirrhosis should be considered.

In 11.7% of examinees, the cause of the ascites was malignant disease. Distribution of causes of ascites would be different if the examined patients had been from the Departments of oncology, cardiology or pediatrics.[11,12]

Ascites represents a clinical challenge that we encounter daily. Selection of the optimal treatment of each patient depends on the circumstances that led to the ascites emeorgence. The therapy requires very careful monitoring of pharmacological treatment with special attention to the balance of body fluids. In this study, ascites was treated by repeated abdominal puncture in the first group of examinees, while the second group was treated by a combined application of diuretics (furosemide and spironolactone).

Certain discomforts related with the applied treatment method may arise during ascites therapy. This study

demonstrated no grave or undesirable effects of the applied therapy that would require disruption of therapy or exclusion from the study . Therapy tolerability was very good in 68% patients, it was good in 29% patients, while 3% patients showed poor tolerance for the applied ascites therapy. There was no statistically significant difference between the patient groups, which supports the fact that both abdominal puncture as well as diuretic therapy are well tolerated in conditions of hospitalization. However, the study demonstrated that there was statistically significant difference between the groups of patients with regard to the effectiveness of therapy. The difference reflects in the fact that the patients from the group treated with abdominal puncture showed significantly smaller percentage of the unsatisfactory effect in gradation. Furthermore, the group of patients treated with abdominal puncture demonstrated significantly larger percentage of the excellence of the effects of the therapy in gradation.

The study presented the assessment of the effectiveness of the applied therapy as superiorly better for the group of patients treated with abdominal puncture. The results of these clinical tests noted abdominal puncture as a quicker and more efficient therapy method, which was confirmed by other authors as well.[13]

Conclusion

There was no statistically significant difference between the groups regarding the level of discomfort and complications of the applied therapy. Abdominal paracentesis achieves an optimal clinical response in therapy of patients with ascites of stages 3+ and 4+.

Adequate knowledge of the etiology of ascites, its early diagnostics and capacities for prevention prove to be of particular importance. Observation of therapeutic recommendations and their application in clinical practice facilitate a more uniform position in ascites treatment.

The authors of this article have not declared any conflict of interest related to this study.

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Komparacija abdominalne punkcije i diuretika tokom terapije ascitesa

SAŽETAK

Uvod. U kliničkoj praksi terapija ascitesa je u većini slučajeva nezadovoljavajuća i često praćena mnogobrojnim komplikacijama. Tokom terapije mogu se javiti različiti problemi u vezi sa primijenjenom terapijskom metodom. Cilj rada je bila komparacija abdominalne punkcije i diuretika kod dvije homogene grupe ispitanika, radi utvrđivanja podnošljivosti i efikasnosti primijenjenog odgovarajućeg terapijskog protokola.

Ispitanici i metode. Ispitivano je ukupno 60 pacijenata sa ascitesom u stadijumu 3+ i 4+ , koji su podijeljeni u dvije grupe. Prva grupa je liječena abdominalnom punkcijom više puta nedeljno, dok je druga grupa ispitanika liječena diureticima bilo monoterapijski ili kombinovano. Najveći broj ispitanika (86,7%) je primijenjeni terapijski protokol podnio bez tegoba. Na bolove u trbuhu se žalilo 6,7% ispitanika, grčeve 3,3%, malaksalost 1,7% i mučninu 1,7% bez statistički značajne razlike između dvije grupe ispitanika (p>0,05). Registrovane tegobe su bile blagog (5%) do umjerenog stepena (8,3%), dok je samo u 1,7% bolesnika iz grupe liječenih abdominalnim punkcijama registrovana komplikacija u vidu curenja ascitesa na mjestu punkcije.

Zaključak. Nema statistički značajne razlike između grupa ispitanika u odnosu na stepen tegoba i komplikacije primjenjene terapije ascitesa (p>0,05). U hospitalnim uslovima abdominalna punkcija i diuretska terapija se jednako dobro podnose. Eventualne potencijalne opasnosti od terapije ascitesa se mogu smanjiti na najmanju moguću mjeru intenzivnim praćenjem pacijenta.

Ključne riječi: ascites, abdominalna punkcija, diuretici, efikasnost terapije

ORIGINAL ARTICLE

UDK 618.19-006-085

Sentinel Lymph Node Biopsy In Breast Cancer: Validation Study And Comparison Of Lymphatic Mapping Techniques

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ABSTRACT

Introduction: Sentinel lymph node biopsy is a standard staging procedure in patients with early breast cancer. Aim of the study is a validation procedure of sentinel lymph node biopsy (SLNB) in our institution and comparison between two mapping techniques - isotope mapping and methylene blue dye for lymphatic mapping.

Material and methods: The study comprised 75 women with breast cancer of clinical stage T1-2N0M0. We analyzed patients from June, 2010 to March, 2013. In 39 patients, (Group A) lymphatic mapping technique was performed by using the peritumoral injection of 37MBq activity isotope (99m Technetium NANOCIS),and in 36 patients (Group B) mapping technique was performed by using the periareolar injection of 2-4 ml blue dye (Methylene blue 1%). Axillary dissection was performed in both groups after SLNB.

Results: Out of 75 patients, sentinel lymph node was identified in 68 (90.7%). Identification rate was similar between the groups - 89.7% (Group A), 91.7% (Group B). Accuracy rate was 97% between the groups, that is, Group A 97.1% and Group B 96.9%. In relation to the Group A (90.6%), sensitivity rate was slightly higher in the Group B - 91.6%,. False negative rate of SLNB was higher in the Group A (9.1%) in relation to the Group B (8.3%). The average number of sentinel nodes detected in both groups was 1.2.

Conclusion: The results of the study confirmed and validated both methods of lymphatic mapping techniques in SLNB. There were no significant statistical differences ($p>0.05$) in accuracy, sensitivity and false negative rate between these two groups.

Keywords: breast cancer, sentinel lymph node biopsy, isotope, blue dye

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(Scr Med 2014:45:56-61)

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Introduction

On the basis of numerous clinical studies carried out over many years, the procedure of sentinel lymph node biopsy (SLNB) was taken as a valid procedure in diagnosing lymph node axillary metastasis in invasive breast cancer.[1-3]

In clinical manuals, the following methods of marking, that is, mapping of sentinel lymph node (SLN), are recommended: isotope mapping method, blue dye mapping method and a combined mapping method with blue dye and isotope.[4,5] Before SLNB introduction, validation studies were conducted with the aim to determine predictive values of sentinel lymph node in relation to the status of other lymph nodes in the axilla, and, at the same time, to practice surgical teams in the procedure conducting.[6-9] Practical importance of SLNB procedure can be seen in significant decreasing of postoperative comorbidity (lymphedema, parenthesis, pain, etc.) in relation to the patients who underwent axillary lymphadenectomy.

The study conducted in our institution had an aim to determine procedure validity and compare the methods of SLN blue dye mapping (methylene blue) and isotope (Technetium, 99Tc).

Materials and methods

The study was conducted in Clinical Center Banja Luka in the period from June, 2010 to March, 2013. It was approved by the Ethic Council of Clinical Center Banja Luka. 75 patients who fulfilled the criteria for participating in study were analyzed in this period. Sentinel biopsy procedure was first introduced to the patients and they gave a written consent to participate in the study. The patients fulfilled the following criteria to enter the study: female patients, 30-year-olds and more, histologically verified primary invasive breast cancer, unifocal tumor in a breast, clinical axillary area without dubious palpable lymph nodes, ultrasound check up without visualization of dubious infiltrated lymph nodes, clinic stage T1/2NoMo, that in the past, lymph node sentinel biopsy in axillary area was not performed, that axillary area was not treated by rays and/or operated, that a patient was not pregnant, and that a patient previously did not receive neoadjuvant chemotherapy.

The patients with histologically verified invasive breast cancer were separated in two groups: patients in which sentinel lymph node mapping was performed by isotope application (Group A), and in which sentinel lymph node mapping was performed by blue dye (Group B).

In Department of Nuclear Medicine of Clinical Center Banja Luka, radioisotope technetium-nano-sulphur colloid used in sentinel lymph node mapping procedure was obtained from pharmaceutics nano-sulphur colloid (Cis Bio international Paris, France) and technetium pertechnetate (Tc99m). Preoperatively, in the case of a palpable tumor, radioisotope was applied subcutaneously peritumoral. In a case of a non-palpable tumor, radioisotope was applied periareolar, usually four puncture spots in the amount of 0.2ml per puncture spot in a dose of 0.25mCi (9.25MBq), that is in total, 0.8ml in radioactivity dose 1mCi (37MBq). The procedure was conducted 1 to 4 hours prior to an operation. Sentinel lymph node was intra-operatively detected by mobile gamma camera. Mobile gamma camera "Europrobe" (Lyon, France) was used for detection. While detecting, one or more sentinel lymph nodes were identified.

Figure 1. Mobile „gamma" probe

All identified sentinel nodes were analyzed histopathologically intra-operatively ("ex tempore") on frozen sections, and afterwards, on permanent paraffin molds, depending on size and number of samples, by standard method of dyeing hematoxylin-eosine (HE).

During the operation, mobile gamma camera detected a place of greatest radiation, and after extirpation, radiation level of an extracted sentinel node was detected on a counter. As a proper parameter, a radiation detection 10 times bigger in relation to surrounding tissue was taken.[2,3] After performed sentinel lymph node biopsy, axillary lymphadenectomy was performed in all patients in the group. Total number of analyzed patients in Group A was 39 women.

In the other group (Group B), sentinel lymph node mapping was performed by method of dyeing with blue dye (Methylene blue 1%), which is in our conditions available because of its economic acceptability. Methylene blue has smaller molecular weight in relation to patent blue and isosulphan blue. Immediately after giving anesthetic to the patient, blue dye (1% Methylene blue) was applied subcutaneously periareolary to a breast quadrant where a tumor was localized in amount of 2 to 4ml. After blue dye application, a gentle massage of a breast was done for 2-3 minutes in order to stimulate lymph drainage. In interval

from 15 to 20 minutes from dye application, incision and exploration of axillary area and visual identification of sentinel lymph node were performed. After identification and extirpation of sentinel lymph node, axillary lymphadenectomy was performed in this group of patients as well. 36 women were analyzed in Group B.

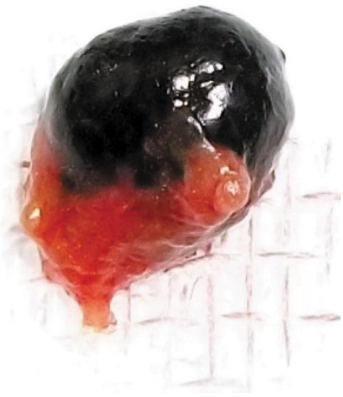

Figure 2. Sentinel lymph node mapped by blue dye

χ^2 test, Fisher's exact test, Yates correction for continuity, Mann-Whitney's Test and Kolmogorov–Smirnov test were used in the analysis. Analytical statistical tool SPSS – version 20 was used in statistical data processing.

Results

In statistical analysis of the patients, the following characteristics of examined groups were processed: age, tumor size, histological grade of a tumor, histological type of a tumor, lymph-vascular and perineural invasion of a tumor, immune-histochemical determined hormone status of a tumor and expression of HER2 gene. In the examined groups, model of an applied surgical treatment was analyzed.

Iin the attached statistical data analysis, except for the type of operation, there is no proved statistically significant difference between examined Groups A and B, according to their general characteristics.

In data related to sentinel biopsy, the following are processed: identification rate, accuracy rate, sentinel biopsy sensitivity rate, false negative results rate, average number of extracted sentinel lymph nodes and presence of micrometastasis in a sentinel lymph node and their correlation with other lymph nodes in dissection of axillary lymphatics.

In Group A, where mapping was performed by isotope, identification rate in the study was 89.7%, while in group B, where mapping was performed by blue dye, the rate was 91.7 %. In Group A, accuracy rate was 97.1% and in group B 96.9%. Our results showed 90.9% sensitivity rate in Group A and 91.6% in Group B. False negative results rate in Group A was 9.1% and in group B 8.3%. Statistically significant difference between examined groups was not determined by using Fisher's test (p=1.000).

Table 1. Characteristics of examined patients and tumors

Characteristics	Group A (Radiotracer 99mTc) n=39	Group B (Methylene blue) n=36	P
Median age (years)	58.6	59.9	0.983*
Median tumor size (mm)	20.5	21.7	0.644*
Histological type			
Invasive ductal carcinoma (NOS)	26 (66.7%)	30 (83.3%)	
Invasive lobular carcinoma	7 (17.9%)	1 (2.8%)	
Hystological grade of tumor			0.068**
Grade 1	9 (23.1%)	2 (5.6%)	
Grade 2	18 (46.1%)	24 (66.7%)	
Grade 3	12 (30.8%)	10 (27.7%)	
ER/PR positive	35 (89.7%)	28 (77.8%)	
ER/PR negative	4 (10.3%)	8 (22.2%)	
HER2 positive	3 (7.7%)	9 (25.0%)	
HER2 negative	36 (92.3%)	27 (75.0%)	
Type of surgery			0.007**
Modified radical mastectomy	7 (17.9%)	18 (50.0%)	
Breast conserving surgery	24 (61.5%)	16 (44.4%)	
Skin sparing mastectomy	8 (20.6%)	2 (5.6%)	
Side of tumor			0.076**
Right breast	17 (43.6%)	24 (66.7%)	
Left breast	22 (56.4%)	12 (33.3%)	
Localization of tumor			
Outer upper quadrant	12 (30.8%)	10 (27.8%)	
Junction of upper quadrants	9 (23.1%)	5 (13.9%)	
Upper inner quadrant	16 (41.0%)	6 (16.6%)	
Others	16 (41.0%)	15 (41.7%)	

* - Mann Whitney test, **- c-square test

Table 2. Sentinel biopsy results

	Group A (Radiotracer 99mTc) n=39	Group B (Methylene blue 1%) n=36	P
Identification rate	35/39 (89.7%)	33/36 (91.7%)	1.000*
Accuracy rate	34/35 (97.1%)	32/33 (96.9%)	1.000*
Sensitivity rate	10/11 (90.9%)	11/12 (91.6%)	1.000*
Positive predictive value	100%	100%	
Negative predictive value	96.0%	95.4%	
False negative rate	1/11 (9.1%)	1/12 (8.3%)	
Mean number of SLNs	1.2	1.2	

* - Fisher's exact test

Discussion

So far, many conducted comparative studies showed that a percentage of sentinel lymph node identification by usage of double method was bigger in relation to mapping using only blue dye or isotope. In comparison of sentinel lymph node mapping methods with blue dye and mapping with isotope, there was no statistically significant difference related to accuracy rate, sensitivity rate and false negative results rate of a sentinel node.[10-12] Dilemma whether to use just one reagent or both in the sentinel biopsy procedure is still without consensus and for now, there are only recommendations.

Because of its acceptable price, methylene blue is a dye which is available for all the health institutions. In the case of dye validity, methylene blue dye in a sentinel biopsy procedure, in relation to the other two (patent blue, isosulphane), previously conducted studies did not confirm superiority of patent blue and isosulphane in relation to methylene blue dye. The results of these studies showed that methylene blue dye is valid in sentinel biopsy procedure. There was no statistically significant difference in efficiency of sentinel biopsy procedure in relation to the method of dyeing with methylene and isosulphane or patent blue dye.[13-15] Disadvantage of the studies dealing with methylene blue dye used in sentinel biopsy procedure was in a number of analyzed patients. Those were usually single institution studies involving a relatively small number of patients. Vital methylene blue dye related to patent and isosulphane dyes has certain advantages, such as lower price and low allergy potential, but it also has some disadvantages which reflect in lower resorption in lymph flow, in relation to the other two dyes. In our study, we applied methylene blue dye in 36 patients. In all examined patients who underwent sentinel biopsy procedure with methylene blue dye, we did not record any kind of allergic reactions. As for side effects, only mention temporary pigmentation of skin in the place where dye was injected and temporary urine discoloration is worth mentioning.

Nowadays, there is still no clear consensus and attitude about optimal spot for application of isotope and blue dye. There are two basic localizations for marker application. One technique is to apply isotope or blue dye in the tumor area, that is peritumoral, and the other one is based on applying the marker in the area of areolar complex, that is periareolar. The other dilemma concerns the depth of marker application; one option recommends superficial, subcutaneous application, and the other one recommends deeper, that is parenchyma marker application.

British study (The New Start) and French study (FRANSENODE) note that optimal spot for dye application is periareolar localization towards a breast quadrant of the tumor location, so as subcutaneous dye injection.[7,16] We practiced methylene blue dye application in periareolar area subcutaneously towards a breast quadrant where the tumor change was localized. This type of application is also more practical at non-palpable lesions.

In more extensive studies, identification rate was from 80% - 99%.[1-3,6] On the basis of the results of the studies done so far, in most cases ,double method of sentinel node mapping has the biggest identification rate. Validity and success of SLNB procedure is valued on the basis of accuracy rate. SLNB accuracy rate in more extensive studies was from 95-99%.[2,3,9] Sensitivity rate in study NSABP B-32 in mapping SLN by blue dye was 87.8%, while isotope mapping was more successful with 92.2%.[3] In some studies, sensitivity was greater in patients who underwent SLN mapping by blue dye.[17] Many studies indicated bigger sensitivity rate in SLN mapping by double method.[2,9] One of the first validation studies done at the area of former Yugoslavia showed blue dye sensitivity rate at 82% and double method at 95%.[18] SLN false negative results rate in the studies varied from 2-22%.[19-21] In the studies involving greater number of examined patients, false negative results rate was from 6.7%, 8.2% to 11.4%.[9,22,23] Results of validation study conducted in our institution pass all criteria set by most of training programs and recommendations of oncology associations dealing with introduction of SLNB procedure in standard use.

In present micro-metastasis in SLN, without any official confirmation in the form of clinical manuals, the attitude which is becoming more and more common is not doing the axillary lymphadenectomy. On the basis of obtained results of the study IBCSG 23-01 there was no statistically significant difference in five years period without disease (DFS, Disease free survival) between a group of patients who underwent lymphadenectomy and a group of patients who did not undergo lymphadenectomy after verified

metastasis in SLN.[24] In our study, micrometastatic deposits in SLN were verified in four patients, and observing the state of other lymph nodes in lymphadenectomy preparation, there were no verified metastatic deposits.

Recent studies (ACOSOG Z0011 trial) have given the results which are still discussed by experts, and they are related to an attitude that axillary lymphadenectomy in early invasive breast cancer should not be done, not even if macrometastasis of breast cancer are histologically verified in sentinel lymph node.[25] In such cases, axillary area would undergo radiotherapy. The results of the American study Z0011 showed that there were no statistically significant difference between examined groups of patients regarding the overall survival (OS, Overall Survival) and a period without disease (DFS) in women who underwent axillary lymphadenectomy and those who underwent radiotherapy of axillary area after histologically verified macro-metastasis in SLN.[25] A study of European Oncology Institute in Milan (SOUND trial) went even further, stating that in the case of early invasive breast cancer with clinically negative axillary area, nothing more than an observation should be done.[26] An attitude of experts about this is not unanimous.[27] German, Austrian and Swiss Senologic Society still withhold their attitude towards this subject.[28] Their recommendation is to avoid lymphadenectomy in positive SLN only in groups of patient with a low risk for disease return and clinically and ultrasonographicly negative axillary area.

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Sentinel biopsija limfnog čvora kod karcinoma dojke: Validaciona studija i komparacija metoda obeležavanja sentinel čvora

SAŽETAK

Cilj: Sentinel biopsija limfnog čvora je standard u tretmanu pacijenata oboljelih od ranog invazivnog karcinoma dojke. Cilj istraživanja je standardizacija procedure sentinel biopsije u našoj ustanovi i poređenje metode obilježavanja sentinel limfnog čvora između tehnike obilježavanja radiofarmakom i tehnike obilježavanja tkivnom bojom.

Materijal i metode: U istraživanju je učestvovalo 75 žena oboljelih od karcinoma dojke sa kliničkim stadijumom T1/2N0M0. Ispitanice su analizirane u periodu od juna 2010. godine do marta 2013. godine. Kod 39 ispitanica (Grupa A), za obilježavanje sentinel čvora korišćen je radiofarmak Tehnecijum aplikovan peritumorski u aktivnosti od 37MBq. Kod 36 ispitanica (Grupa B), za obeležavanje je korišćena 1% tkivna boja metilen plavo koja je aplikovana periareolarno u volumenu od 2-4ml. Disekcija aksilarnih limfatika sprovedena je kod svih pacijentkinja nakon procedure sentinel biopsije.

Rezultati: Od ukupno 75 analiziranih ispitanica, sentinel limfni čvor je identifikovan kod njih 68 (90,7%). Stopa identifikacije bila je slična između poređenih grupa - u grupi A iznosila je 89,7% , a u grupi B 91,7%. Stopa preciznosti iznosila je 97%, između poređenih grupa 97,1% (Grupa A) i 96,9% (Grupa B). Stopa senzitivnosti je bila nešto veća u grupi B (91,6%) u odnosu na grupu A (90,9%). Stopa lažno negativnih nalaza sentinel limfnog čvora bila je veća u grupi A (9,1%) u odnosu na grupu B (8,3%). Prosečan broj izvađenih sentinel čvorova iznosio je 1,2.

Zaključak: Rezultati istraživanja potvrdili su validnost obe metode obilježavanja kao i samu proceduru sentinel biopsije. Između poređenih grupa nije bilo značajne statističke razlike (p>0,05) u odnosu na stopu identifikacije, preciznosti, senzitivnosti i lažno negativnih nalaza.

Ključne riječi: karcinom dojke, sentinel biopsija, radiofarmak, tkivna boja

ORIGINAL ARTICLE

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Life Quality Of Patients Treated With Fixed And Mobile Dentures

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ABSTRACT

Introduction. One of the most important objectives of an oral health care is helping patients in the effort to reach a high level of satisfaction with their mouth cavity with or without teeth.

Patients and Methods. The paper aims to establish the connection between the satisfaction of patients treated with fixed and mobile dentures on one side, and oral health, quality of life and psychological characteristics of patients on the other. The research was conducted as a prospective study with 320 patients separated into three groups – group I (patients treated with fixed dentures), group II (patients treated with mobile dentures), and group III (patients treated with both mobile and fixed dentures). The oral related life quality was observed within five dimensions: anamneses data, symptoms of ill-functioning of stomatogenic system (chewing and speech), dental status – extraoral, dental status – intraoral and dental abilities.

Conclusion. The linear regression model was adopted for the purpose of analysis of target markers and oral health determination. The research showed that oral-related quality of life in patients treated with fixed and mobile dentures was most affected by intraoral clinical features, psychological characteristics, and the type of denture, along with a whole range of minor factors (age, timing of denture treatment after the teeth loss, period of denture usage, order of denture implantation, mouth cavity hygiene, diet).

Key words: quality of oral health, dental abilities, oral health features

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Introduction

One of the most important objectives of an oral health care is helping patients in the effort to reach a high level of satisfaction with their mouth cavity with or without teeth.[1,2] The research of oral health and its impact on patients' life quality has largely advanced in late 20th and early 21st century.3,4 In this regard, only few studies have proved interdependence among the psychological profile, oral status, denture treatments, and a patient's quality of life. Thereby, the aim was to estimate specific forms of social functions, behavior, and effects of patient's oral health satisfaction, all of which are expressed via aesthetics, performance, and functions.[5]

Strauss and Hunt [6] inferred that dental disease and consequences of oral treatments affected patients' ability to live and enjoy life, make social connections, be positive about their jobs, and stay positive. Oral health satisfaction can be measured by using different indicators such as taste, pain, speech, aesthetics, etc. All these affect the quality of life.[7]

As he studied the effects of oral health on denture-treated patients' daily performances, Wostmann[8] concluded that the quality of life greatly improves upon the denture treatments. The improvement referred to appearance, functions, comfort, pain relief, and eating disorder. World Health Organization initialized these issues within the context of development policy in 1980s.[9]

Our target study resulted in an original model for the estimation of oral-related quality of life. The research covered five dimensions of dental health quality: anamneses data, symptoms of ill-functioning stomatogenic system (chewing and speech), dental status – extraoral, dental status – intraoral and dental abilities. Eventually, it confirmed our initial hypothesis on the interdependence between the quality of life on one side and psychological profile and type of denture on the other.

Having tested the model of oral-related quality of life on patients treated with fixed and mobile dentures under the clinical conditions, we assumed that the improvement of patients' life quality should be managed in a responsible and institutional manner.

Methods and materials

The research was conducted at the Institute of stomatology in Banja Luka and it covered 360 patients singled out in three groups: group I (patients treated with fixed dentures), group II (patients treated with mobile dentures), and group III (patients treated with both mobile and fixed dentures). Each group had the identical number of patients and equal age and sex structure. All denture treatments were performed in order to establish complete mastication and other oral functions. For the purpose of the research, a special dental record was designed and the data were entered for each individual patient. The dental record included the following information: the general information with 10 markers, anamneses data with 16 markers, symptoms of ill-functioning oral system (chewing and speech) with 6 markers, clinical examination – extraoral dental status with 8 markers, clinical examination – intraoral status with 12 markers, additional clinical procedures with 5 markers, scanning of TM joints with 3 markers and a questionnaire of dental abilities with the total of 36 markers grouped in five dimensions (appearance, pain, comfort, satisfaction, and eating limitations). Each questionnaire provided three entry options: positive, neutral, and negative.

Patients had been observed for 17 months ranging from May 2012 to September 2013. The clinical dental status, dental abilities, and psychological status of each patient were estimated three times - at the beginning of the research, six months afterwards, and at the end.

The statistical methods of the research were as follows[10]: statistical methodology applied at the research result display covered four research phases – descriptive statistics, statistical analysis, inferential statistics, and the research deduction and decision making. Statistical methods were applied via relevant statistical standards (ISO 10576-1: Statistical methods – Guidelines for the evaluation of conformity with specified requirements – Part 1: General principles; ISO TS 21747: Statistical methods – Process performance and capability for measured quality characteristics; ISO 11453: Statistical interpretation of data – Tests and confidence intervals relating to proportions; ASQ Z1.4: Sampling procedures and tables for inspection by attributes) and the standard software was used (Microsoft Office: Excel 2010, www.microsoft.com/Office365).

Modeling of oral-related quality of life: Dental health quality was observed through five dimensions - anamneses data, symptoms of ill-functioning stomatogenic system (chewing and speech), dental status – extra-oral, dental status – intraoral, and dental abilities. The quality of oral health was modeled as the linear regressive model with hierarchical weight coefficient, assuming that the adequate regressive residues were equal to zero. Thus, the index of dental health quality was presented by using the general regression equation:

$$I_{KDZ} = K_A * I_A + K_S * I_S + K_{DSE} * I_{DSE} + K_{DSI} I_{DSI} + K_{DS} * I_{DS}$$

in which I_{KDZ} is the dependent variable, i.e. the index (score) of dental health quality; K_A is regression coefficient, i.e. the hierarchical weight coefficient of the dental health quality dimension referred to as "anamneses", I_A is the independent variable, i.e. the index (score) of the dental health quality dimension referred to as "anamneses", K_S is the regression coefficient, i.e. the hierarchical weight coefficient of the dental health quality dimension referred to as "symptoms", I_S is the independent variable, i.e. the index (score) of the dental health quality dimension referred to as "symptoms", K_{DSE} is the regression coefficient, i.e. the hierarchical weight coefficient of the dental health quality dimension referred to as "dental status extra-oral", I_{DSE} is the independent variable, i.e. the index (score) of the dental health quality dimension referred to as "dental status extra-oral", K_{DSI} is the regression coefficient, i.e. the hierarchical weight coefficient of the dental health quality dimension referred to as "dental status intraoral", I_{DSI} is the independent variable, i.e. the index (score) of the dental health quality dimension referred to as "dental status intraoral", K_{DS} is the regression coefficient, i.e. the hierarchical weight coefficient of the dental health quality dimension referred to as "dental abilities" and I_{DS} is the independent variable, i.e. the index (score) of the dental health quality dimension referred to as "dental abilities".

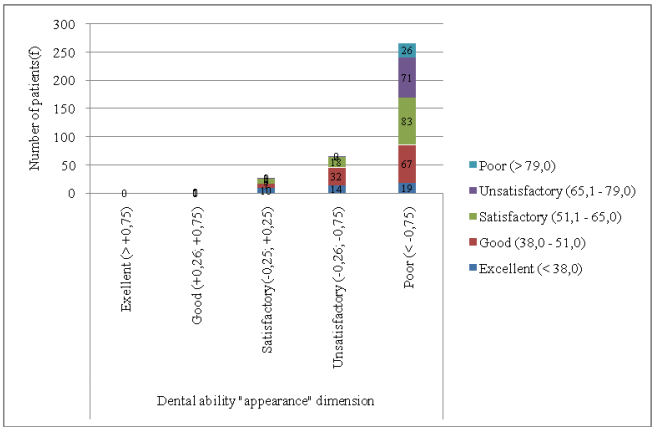
In order to calculate the oral health quality (index), for each observed dimension and element within it, the following was set: relevance rank – hierarchical weight coefficient

and contribution (positive – the more the better, negative – the less the worse).

Results

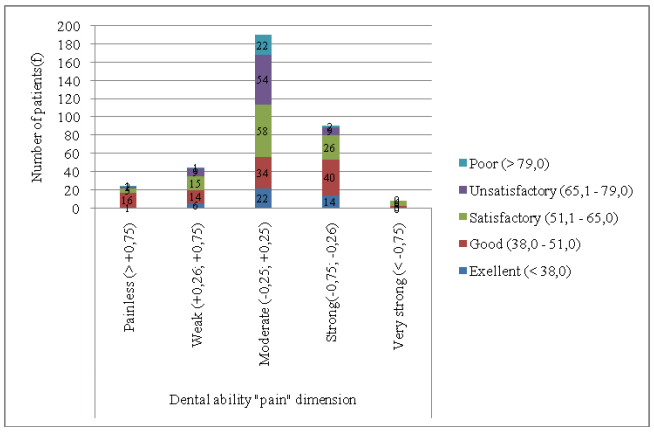
The clinical research determined the dental health quality (index) with the chosen sample of 360 patients treated with fixed and mobile dentures. The result was that the oral-related life quality can be divided into five attributive categories depending on the total number of index score obtained by calculating index of dental health quality for each patient: excellent (score<38,0), good (score 38,0-51,0),satisfactory (score 51,1-65,0), unsatisfactory (score 65,1-79,0) and poor (score (>79,0).

The effect of individual dimensions of dental abilities (as a psychological category) was observed separately. We shall display the research results showing impact of five dimensions of dental abilities (appearance, pain, conformity, satisfaction, eating limitations). Each dimension of dental abilities was divided into five attributive categories as shown in pictures.



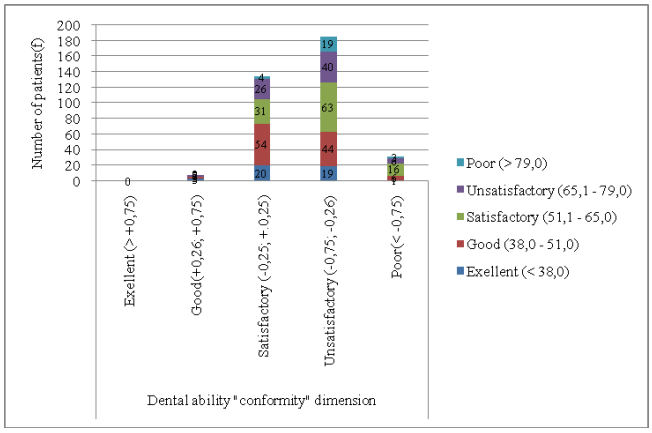
Picture 1. Distribution of patients and their oral-related life quality from the aspect of the dental ability dimension referred to as "appearance"

Picture 1. displays the effect of the dental ability dimension termed "appearance" on the patients' oral-related quality of life, i.e. it shows how patients' satisfaction with appearance, color, and teeth distribution affect their quality of life. The aesthetic appearance of patients is very important, and it provides the patients with confidence along with the adequate therapy, teeth settings, color choice, and shape and size of the teeth. Testing proved that there was a statistically relevant difference between oral-related quality of life and the dental ability dimension referred to as "appearance" (p=0, 0029).



Picture 2. Distribution of patients and their oral-related life quality from the aspect of the dental ability dimension referred to as "pain"

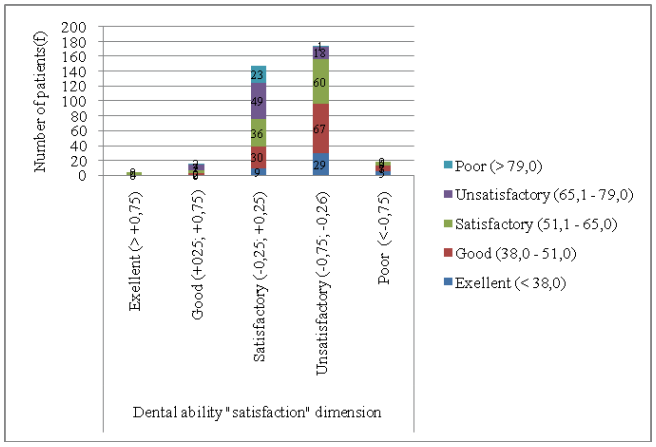
Picture 2. displays the effect of the dental ability dimension referred to as "pain" on the patients' oral-related quality of life, i.e. it shows how patients' type of pain, intensity of pain (small, moderate, strong, very strong),pain duration, spontaneous or provoked pain due to physical-chemical agents, hot food, bruxism, trauma, diet, and inflammation affect their quality of life. Testing proved that there was a statistically relevant difference between oral-related quality of life and the dental ability dimension referred to as "pain" (p=0, 0000).



Picture 3. Distribution of patients and their oral-related life quality from the aspect of the dental ability dimension referred to as "conformity"

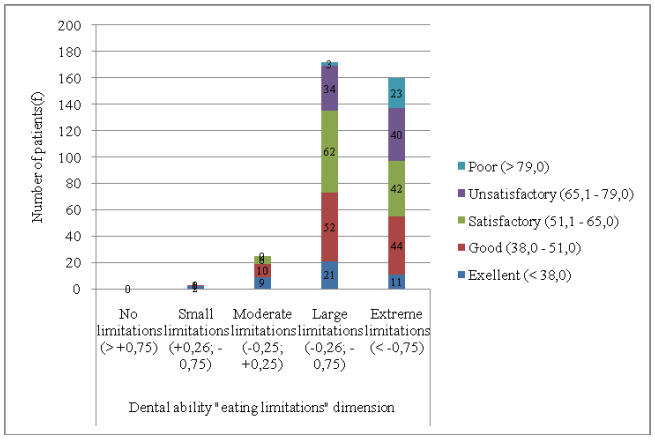
Picture 3. displays the effect of the dental ability dimension referred to as "conformity" on the patients' oral-related quality of life, i.e. it shows how patient's oral-related life quality is affected by teeth and gum issues. The lack of teeth, tooth migration towards empty space within gums, change of tooth position, etc. result in IKP ratio disturbance. Patients are not satisfied with the existing condition within their mouth cavity as it results in no "conformity" while eating and drinking. Testing proved

that there was no statistically relevant difference between oral-related quality of life and the dental ability dimension referred to as “conformity” (p=0, 0633).



Picture 4. Distribution of patients and their oral-related life quality from the aspect of the dental ability dimension referred to as “satisfaction”

Picture 4. displays the effect of the dental ability dimension referred to as “satisfaction” on the patients’ oral-related quality of life, i.e. it shows how the patients’ dental quality of life is affected by teeth appearance and ability to eat and speak from the aspect of their working capacities, teeth appearance and ability to eat and speak from the aspect of social and emotional life, pain from the aspect of social and emotional life, appearance and self-confidence, appearance and laughter, working abilities, stress, and dental pain, sleeping and dental pain. Testing proved that there was a statistically relevant difference between oral-related quality of life and the dental ability dimension referred to as “satisfaction” (p=0, 0000).



Picture 5. Distribution of patients and their oral-related life quality from the aspect of the dental ability dimension referred to as“eating limitations”

Picture 5. displays the effect of the dental ability dimension referred to as“eating limitations” on the patients’ oral-related quality of life, i.e. it shows how oral-related life quality affects the ability to chew and eat. Chewing and mastication depend on the IKP stability, the number of central contacts in occlusal position, lateral movements, absence of occlusal disturbance, pain in TM joints and masticatory muscles, and denture quality. Patients experiencing disturbed occlusion have to change the type of food and the food preparation process. Testing proved that there was no statistically relevant difference between oral-related quality of life and the dental ability dimension referred to as “eating limitations” (p=0, 0633).

Discussion

Researches have shown that different levels of oral health have a various impact on satisfaction of patients treated with fixed and mobile dentures. Poor bibliography indicates that patients’ satisfaction with their oral status, including prosthetics, is in connection with the personality profile, which further implies the necessity for additional studies within the field.[11] Different levels of oral status have different influence on patients’ everyday life. In order to achieve a patients’ quality of life and satisfaction, it is necessary to conduct treatments and obtain a clinical status regardless of the dental status.

Statistical analysis of the patients’ research markers in comparisons with the oral-related life quality showed that there was a statistically relevant difference between dental health quality and dimensions referred to as „appearance“ (p=0,0029), “pain” (p=0,0000) and “satisfaction” (p=0,0000) and that there was no statistically relevant difference with the dimensions referred to as „conformity“ (p=0, 0633) and „eating limitations“ (p=0,0633). These results may be compared with those of Kressin’s[12] who concluded that the measurement of personal perception of one’s oral status may be useful for the patient-doctor communication.

Conclusion

The quality of dental health (index) was modeled and tested within a clinical research covering five attributive markers: excellent, good, satisfactory, unsatisfactory, and poor.

Out of 49 analyzed markers of dental health, 32 markers showed high statistical relevance, 4 were statistically relevant, and 7 markers had no statistically relevant impact on the dental health quality index.

It was proved that all the research markers which had statistically relevant difference in comparison with the dental health quality negatively affected dental abilities of the patients, and the patients grouped in a higher dental health category suffered a poorer impact of negative markers.

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Kvalitet života pacijenata saniranih fiksnim i mobilnim stomatoprotetičkim radovima

SAŽETAK

Uvod. Jedan od najvažnijih ciljeva stomatološke njege i zaštite je pomoć pacijentima u nastojanju da dostignu visok nivo zadovoljstva stanjem usne šupljine sa ili bez zuba.

Ispitanici i metode. Utvrditi vezu između zadovoljstva pacijenata saniranih fiksnim i mobilnim stomaprotetičkim radovima, s jedne te oralnog zdravlja, kvaliteta života i psiholoških karakteristika pacijenata, s druge strane. Istraživanje je provedeno kao prospektivna studija, na uzorku od 320 pacijenata, svrstanih u tri brojčano jednake grupe: I grupa, pacijenti sanirani fiksnim stomatoprotetičkim radovima; II grupa, pacijenti sanirani mobilnim stomatoprotetičkim radovima; III grupa, pacijenti sanirani mobilnim i fiksnim stomatoprotetičkim radovima. Kvalitet dentalnog zdravlja posmatran je kroz 5 dimenzija: anamnestički podaci; simptomi poremećaja funkcija stomatogenog sistema (žvakanje i govor); dentalni status – ekstraoralni; dentalni status – intraoralni; dentalne sposobnosti.

Zaključak. Za analizu istraživačkih obilježja i određivanje kvaliteta dentalnog zdravlja usvojen je linearni regresioni model sa hijerarhijskim težinskim koeficijentima. Istraživnje je pokazalo da na dentalni kvalitet života pacijenata saniranih fiksnim i mobilnim stomatoprotetičkim radovima najveći uticaj imaju intraoralna klinička slika, psihološke karakteristike i vrsta stomatoprotetičke nadoknade, te niz drugih, relativno manje uticajnih faktora (dob pacijenta, vrijeme sanacije nakon gubitka zuba, period korištenja nadoknade, redoslijed nadoknade, nivo higijene usne duplje, način ishrane).

Ključne riječi: kvalitet dentalnog zdravlja, dentalne sposobnosti, dimenzije dentalnog zdravlja

PROFESSIONAL PAPER

UDK 615.825:616.711

Cheneau Brace In The Treatment Of Idiopathic Scoliosis

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ABSTRACT:

Introduction. Scoliosis is a three-dimensional deformity of the spine that requires a three-dimensional correction.

The aim of the paper. The aim was to evaluate the effectiveness of the Cheneau brace in the treatment of idiopathic scoliosis.

Patients and Methods. The retrospective study included 20 girls treated by the Cheneau brace. The criteria for inclusion were: double idiopathic thoracolumbar scoliosis over 20 degrees as measured by Cobb at the beginning of the treatment, continuous treatment with a brace and exercises controlled by an expert team until the end of growth and upon reaching skeletal maturity (Risser 5). The data were collected from medical records: age, the value of Cobb's angle and degree of bone maturity at the beginning and end of treatment. We analyzed changes in scoliosis at the end of treatment compared to the initial curve by examining the two radiographs made at the beginning and end of treatment. The change of scoliosis is described as: reduced, stabilized or worsened curvature. The success of the treatment is considered to be the reduction and stabilization of scoliosis.
Statistical analysis tool SPSS was used for result presentation and statistical inference.
Values $p<0.05$ were considered statistically significant differences.

Results. Success in treatment (reduction / stabilization of scoliosis) was noted in 90% of the respondents. Thoracic scoliosis was reduced in 50% of patients, stabilized in 40%, worsened in 10% of children. Reduction of lumbar scoliosis is in 70% and stabilization in 25% of patients. The average correction of thoracic scoliosis is six degrees ($p <0.002$) and correction of lumbar scoliosis is eight degrees ($p <0.001$). The average age at baseline was 12.7 years; girls have had approximately five braces changed during 4.5 years of treatment.

Conclusion. The results of this study confirm the efficiency of the Cheneau brace in the treatment of idiopathic scoliosis in 90% of patients.

Key words: idiopathic scoliosis, Cheneau brace

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Introduction

Idiopathic adolescent scoliosis is a complex three-dimensional deformity of the spine, with the lateral curve in the frontal plane, rotation in transverse plane and profile change in the sagittal plane.[1,2] Scoliosis is diagnosed by clinical examination, and treatment decisions are based on radiological findings. The standard parameter for assessing the curvature in the frontal plane is the Cobb angle. It is a leading factor in therapy evaluation, along with all the parameters that define child growth and development and the importance of curvature progression in the growth period.[2] Risser sign defines bone maturity and the completion of growth.[3] Conservative treatment of the scoliosis involves kinesitherapy, application of braces, radiological testing, regular monitoring of the flow of treatment, monitoring of the respiratory function and psychological support.[4] The indication for a brace application is curvature of the spine of 20-45 degrees measured by Cobb and Risser sign of bone maturity up to three (3).

Scoliosis, as a three-dimensional deformity, requires a three-dimensional correction (3D), in all three anatomical planes.[5,6] Among the more contemporary braces that satisfy this principle is the Cheneau brace.

The aim of the paper

The aim was to evaluate the effectiveness of the Cheneau brace in the treatment of adolescent idiopathic scoliosis.

Patients and Methods

The retrospective study included 20 girls treated by the Cheneau brace at the Institute of Physical Medicine and Rehabilitation " Dr Miroslav Zotović " in Banja Luka, in the period from 2006 to 2013. The girls were chosen randomly. Inclusion criteria for this research were: 1. double idiopathic thoracolumbar scoliosis over 20 degrees by Cobb at the beginning of treatment and 2. continuous treatment - Cheneau brace and exercises under the control of the team of experts until the cessation of growth and achieving bone maturity (Risser 5). The girls used the Cheneau brace for 22 hours a day and were exercising daily for two hours until the termination of the treatment.

The data for this study were taken from medical documentation: the girls' age at the beginning and end of the treatment, the value of Cobb angle and degree of bone maturity (Risser) at the beginning and end of the treatment, the number of the braces replaced by each girl. The average age of the children was determined at the beginning of the treatment, the average number of years in treatment and the number of the braces made.

The change of scoliosis was analyzed at the end of the treatment in comparison to the initial curvature by examining the two radiographs of the spine with the Risser sign displayed in posteroanterior at the end and beginning of the treatment. The thoracic and lumbar curvatures were measured by Cobb and the values of the curvatures for every child and each curvature at the beginning and end of the treatment were compared. Based upon the value changes of the Cobb angle on the two radiographs, the treatment outcome was defined:

1. the curvature reduction (for more than 5 degrees measured by Cobb)
2. the curvature stabilization (when the change was not more than 5 degrees)
3. the curvature deterioration (curve increased by more than 5 degrees).

The success of the treatment was considered to be the reduction and stabilization of scoliosis.

The degree of bone maturity was measured when the treatment began and was compared with the final outcome of treatment, when the treatment was completed and when the radiological bone growth verification of all patients was completed. The significance of the change and the success of treatment in children with high risk of progression of scoliosis (Risser under three) was evaluated.

Statistical analysis tool SPSS was used for result presentation and statistical inference.

Values $p<0.05$ were considered statistically significant differences.

Results

In 90% of the examinees [n = 18] in the research, with double thoracolumbar idiopathic scoliosis, the treatment with the application of the Cheneau brace and by continual exercising was successfully finished. Out of 20 thoracic curvatures, 18 of them were treated successfully, and one (1) out of 20 lumbar curvatures has deteriorated. The structure of the examinees and value change of the scoliotic curves measured by Cobb is available in Table 1.

Average thoracic scoliosis at the beginning of the treatment was 33.80 degrees and the lumbar scoliosis was 29.45 degrees. The average age at the beginning of the treatment was 12.7 [SD=1.29].

The greatest measured scoliosis were 45 degrees [n=2], which were successfully controlled by the action of brace. The lowest scoliosis of 20 degrees [n=3] became either reduced [n=2] or deteriorated [n=1, lumbar scoliosis with Risser of 3]. Characteristic of the smallest lumbar curves (20 degrees) is that they are secondary curves, of primary major thoracic scoliosis (30-40 degrees), which were stabilized during the treatment (Table 1). The largest scoliosis at the end of the treatment was 40 degrees, in the

thoracic segment [n=4], and the smallest was 10 degrees, in the lumbar segment [n=5].

Table 1. Structure of the respondents and changes of findings

Children	Age (year)	Risser	TSPTTSAT (Cobb angle)		LSPTLSAT (Cobb angle)		GT	BM
1	12	2	44	40	40	35	5	5
2	14	2	25	20	30	25	3	3
3	13	0	42	25	23	10	4	5
4	11	0	38	30	25	15	6	7
5	11	0	35	30	31	20	6	6
6	12	0	25	25	25	20	5	5
7	13	0	26	14	34	25	4	5
8	13	1	42	35	32	30	4	5
9	11	0	22	30	34	23	6	7
10	12	1	40	20	30	10	5	4
11	14	2	29	19	25	15	3	4
12	14	2	45	40	36	30	3	3
13	14	3	28	21	24	10	3	3
14	14	3	28	30	20	26	3	3
15	13	3	40	20	20	10	4	3
16	12	3	40	30	30	20	5	4
17	11	0	26	20	30	30	6	7
18	12	1	27	23	45	30	5	5
19	14	3	44	40	35	25	3	3
20	14	3	30	40	20	10	3	3

Key: TPT-Thoracic scoliosis prior to treatment, TAT-Thoracic scoliosis after treatment,
LPT-Lumbar scoliosis prior to treatment, LAT-Lumbar scoliosis after treatment,
GT- Years of treatment, BM –Number of braces

On average, every girl changed five braces during growth and treatment (Table 1). The new braces were made once a year, usually every 10 months. All the girls finished their treatment at the age of 17, and were treated for an average of 4.5 years.

The success in the treatment of scoliosis is considered to be the reduction and stopping (stabilization) of the scoliosis in progression. The thoracic curve was reduced (more than five degrees by Cobb) in 50% of patients [n =10], and stabilized (change of scoliosis up to five degrees) in 40% [n=8], which made a success in treatment up to 90% of children [n =18]. Two curves deteriorated (10% of the children) for more than 5 degrees (Table 2). The treatment was successful in 95% of the lumbar scoliosis [n =19].

Table 2. Result of treatment and Risser's sign

Risser prior to treatment		Risser				
Change of scoliosis after treatment		0	1	2	3	Total
	N	7	3	4	6	20
	%	35.0	15.0	20.0	30.0	100.0
Thoracic scoliosis						
Reduced	N	4	2	1	3	10
	%	57.1	66.7	25.0	50.0	50.0
Stabilized	N	2	1	3	2	8
	%	28.6	33.3	75.0	33.3	40.0
Deteriorated	N	1	0	0	1	2
	%	14.3	0.0	0.0	16.7	10.0
Lumbar scoliosis						
Reduced	N	5	2	2	5	14
	%	71.4	66.7	50.0	83.3	70.0
Stabilized	N	2	1	2	0	5
	%	28.6	33.3	50.0	0.0	25.0
Deteriorated	N	0	0	0	1	1
	%	0.0	0.0	0.0	16.7	5.0

The structure of patients at the beginning of the treatment shows that the potential for deterioration of the curve was great in 14 children (70%), who had the Risser sign less than three (Risser < 3). The treatment was successful in children who had the Risser sign 1 and 2 (Table 2). Reduction of the thoracic scoliosis was greatest in children with Risser sign 1 (66%) [n =7].

Reduction of the lumbar scoliosis was greatest in children with Risser sign 3 (83%) [n = 6].

Deterioration was noted in children with Risser sign 3 [n = 2] and 0 [n = 1].

Maximal correction of the scoliosis was 20 degrees [n=2], in children with the Risser sign 1 and 3 (Table 1). The minimum value of the correction, which is considered the improvement of the findings, is six degrees [n =2], and is characterized by a diverse structure of patients (Risser zero and three, scoliosis less and greater than 30 degrees).

Reduction of the scoliosis up to five degrees is classified as the scoliosis stabilization and it is present in eight thoracic and five lumbar curves (Table 2).

By analyzing the value reductions of the thoracic curves in the overall sample (Table 3), the average reduction is 6.2 degrees [n =20, SD=7.8]. The average reduction of the lumbar curves is 8.5 degrees [n =20, SD = 5.7].

Table 3. Average value of the scoliotic curves at the beginning and at the end of treatment

Scoliosis (Cobb angle)	Mean	Std. Dev.	Mean Correction	Std. Dev.	Std. Error Mean	P
Thoracic curve prior to treatment	33.80	7.84				
Thoracic curve after treatment	27.60	8.16	6.20	7.79	1.742	0.002
Lumbar curve prior to treatment	29.45	6.79				
Lumbar curve after treatment	20.95	8.19	8.50	5.70	1.276	0.000

The lumbar scoliosis are characterised by a greater percentage of reduced scoliosis, lower rate of deterioration (Table 2), and larger curvature correction (Table 3).

By analyzing the bone maturity at the beginning of the treatment with an average degree of curve correction, the greatest one was noted in children with Risser 1, which was average 12 degrees (Table 1).

Discussion

The research so far have shown that with the application of the braces we can change the progress of the scoliosis,[4,7,8] and this paper also confirms the notion by proving the efficiency of the Cheneau brace. Primary goals in treating scoliosis are to reduce the curve and stop the progression of the curve, [4] and that was accomplished at the end of treatment in 90% of the patients. Similar results are present in other researches, where the goal was accomplished in 86% [9] and 100% of patients.[10]

Correction of the curve is depicted differently in various studies. The results vary from 23% of the children,[11] 26% [9] up to 69%.[10] The reduction of the thoracic curves in this research was noted in 50% of the children, and lumbar in 70%, what proves the efficiency of the Cheneau brace, and is also within the results of other researches. In order for the brace to be effective, it has to be functional, must be worn regularly and the treatment should last until the end of growth. All the patients in this research followed the mentioned rules. In some researches, where children quitted their treatment or interrupted continuity of treatment, the results were worse. [12]

In this research, the lumbar scolioses were in higher percentage lowered in comparison to the thoracic, and are characterized by a larger correction of the curves, what other authors also state. [12] Average curve correction (6.2 to 8.5 degrees) is in compliance with other researches.[10,11,12] At the end of treatment the corrections from 6 degrees [12] to 11 degrees [SD = 7,4] [10] are registered.

Stabilization of the curve in the studies varies from 15% [11] to 60% of children. [9] In this research there have been 40% of thoracic and 25% of lumbar curves stabilized, what is also in accordance with the average results of other researches. Scolioses of over 40 degrees were more frequent in thoracic segment [n =5], then the lumbar [n = 1] .They were stabilized at the end of the treatment, while other smaller curvatures in both segments were mainly reduced (Table 1).

There is a direct correlation between the growth potential and progression of the idiopathic scoliosis when the child is in the phase of accelerated growth and when both the body height and growth speed are prominent.[1] The data from this research that all the patients who had Risser 1 and 2 at the beginning of the treatment successfully finished the treatment, indicate the positive effect of the Cheneau brace in long term treatment of idiopathic scoliosis, that by definition, have a great potential for deformity progression. Averagely, the girls wore the brace 4.5 years (Table 1) and regularly exercised, which, along with the braces function, emphasizes the importance of continual cooperation between the child, their parents and the expert.

By analyzing the degree of skeletal maturity at the beginning of the treatment with an average degree of the curve correction, the largest correction was noted in children with Risser 1, with the average correction of lumbar scolioses of 12 degrees, standing out the brace's possibilities in the phase of skeletal growth (Table 1).

By observing the maximal and minimal curvature corrections, in regard to the degree of skeletal maturity, there was no significant change in the structure of the patients, what confirms the importance of individual evaluation and treatment of every scoliosis and every child.

Literature emphasizes the decrease of surgical procedures using the brace. Frequency of the surgery of deformity is said to vary from 0%,[10] 0.9%,[13] to 3.8% [14] in the investigated groups.

The deteriorations in this research did not require any surgical procedure.

The success of this group of patients is a result of a great teamwork and the braces effectiveness. Long term application of the brace during growth, regular exercising and frequent examinations of the team of experts, participation of the parents and continual child support represent a precondition for a successful treatment. Changes in clinical findings of the spine during growth period and also the functionality of the brace require a constant control by the team of experts, individual evaluation, timely drafting

of a new brace which, according to these results, has a good effect in the treatment of idiopathic scoliosis.

Limitations of this research are in regard to the small group of patients and the factors of inclusion that define the group with only the double scoliosis and the application of only one type of brace.

The positive side of this research is that all the patients from the mentioned group have finished their treatment, and the results that we have been provided with allow the insight in the therapeutic of one particular treatment protocol by applying only one brace type.

Conclusion

Successful treatment of idiopathic scoliosis with the application of the Cheneau brace was achieved in 90% of the patients. Scoliosis was reduced in 50% of thoracic and 70% of lumbar curves. Scoliosis was stopped in progression in 40% of thoracic and 25% of lumbar curves.

Deterioration in 10% of the patients did not lead to a surgical procedure. The greater is the degree of correction of the lumbar curves in relation to the thoracic curves. In all the patients with Risser sign 1 and 2 the medical findings were improved. This research proves the therapeutic effect of the Cheneau brace in treatment of the thoracic and lumbar idiopathic scolioses, as long as the brace is applied 22 hours a day and exercises are conducted regularly. The importance of continual application of the brace, physical therapy, team monitoring of the clinical findings and the braces effect emphasize the complexity in treatment of idiopathic scoliosis.

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Cheneau mider u liječenju idiopatskih skolioza

SAŽETAK:

Uvod. Skolioza je trodimenzionalni deformitet kičmenog stuba koji zahtijeva trodimenzionalnu korekciju.

Cilj rada. Utvrditi efikasnost Cheneau midera u liječenju idiopatskih skolioza.

Ispitanici i metode. Retrospektivna studija obuhvatila je 20 djevojčica liječenih Cheneau miderom. Kriterijumi za uključivanje su bili: dvostruka idiopatska torakolumbalna skolioza preko 20 stepeni mjerena po Cobbu na početku liječenja, kontinuirano liječenje miderom i vježbama pod kontrolom stručnog tima do završetka rasta i dostizanja koštane zrelosti (Risser 5). Podaci su prikupljeni iz medicinske dokumentacije: uzrast, vrijednost Cobb-ovog ugla i stepen koštane zrelosti na početku i na kraju liječenja. Analizirana je promjena skolioze na kraju liječenja u odnosu na početnu krivinu uvidom u dva radiograma učinjena na početku i na kraju liječenja. Promjena skolioze je opisana kao: smanjena, stabilizovana ili pogoršana krivina. Uspjeh u liječenju je podrazumijevao smanjenje i stabilizaciju skolioze.
Za prikaz rezultata i statističko zaključivanje korišćen je analitičko-statistički alat SPSS. Statistički značajne razlike smatrane su vrijednosti $p<0.05$.

Rezultati. Uspjeh u liječenju (smanjenje/stabilizacija skolioze) bio je kod 90% ispitanika. Torakalna skolioza je smanjena kod 50% ispitanika, stabilizovana kod 40%, pogoršana kod 10% djece. Smanjenje lumbalne skolioze je kod 70%, a stabilizacija kod 25% ispitanika. Prosječna korekcija torakalne skolioze je šest stepeni ($p<0.002$), a korekcija lumbalne skolioze je osam stepeni ($p<0.001$). Prosječni uzrast na početku liječenja je 12,7 godina; djevojčice su prosječno promijenile pet midera tokom 4,5 godine liječenja.

Zaključak. Uspješno liječenje idiopatskih skolioza primjenom Cheneau midera u navedenom uzorku je ostvareno kod 90% ispitanika.

Ključne riječi: idioptska skolioza, Cheneau mider

PROFESSIONAL PAPER

UDK 616.711-001.5-089

Is The Thoracolumbar Injury Severity Score (TLISS) Still A Good Base For The Education Of Residents In Orthopaedics And Traumatology

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ABSTRACT

Introduction. Thoracolumbar spinal injuries indicated for surgical intervention specify the necessity of intervention within 24 hours. The traumatologists working in a structure without a Spinal Unit must be able to evaluate such injury and set indications for surgical treatment, that is, nonoperative treatment. The purpose of this study is to evaluate if Thoracolumbar Injury Severity Score (TLISS) is still a good base for the classification of thoracolumbar spinal injuries and to give a correct indication for nonoperative, that is, surgical treatment.

Patients and Methods. Six Orthopaedics and Traumatology residents from Siena (Italy), five Orthopaedics and Traumatology residents from the Clinical Centre of Banja Luka (Bosnia and Herzegovina) and five Orthopaedics and Traumatology residents from the Alta Val d'Elsa Hospital, Siena (Italy) were presented 24 clinical cases from professional literature where the following data were indicated: patient's age, neurological conditions, description of the injury, mechanism of the injury and radiological findings (RTG, MR). The abovementioned 24 patients were chosen from the literature based on the injuries mostly seen by an orthopaedist with a lack of experience in the problems of spinal column trauma (low energy trauma, with partial or without neurological impairments, with the TLISS score of 4). The residents from the three groups had to classify all patients according to the TLISS score and to define the most appropriate method of treatment-conservative or surgical, and after that, all classifications, as well as the therapeutic decisions, were compared. The statistical methods used in this study include: statistical significance, reliability ($P<0.05$), the validity of the decision, the percentage of accuracy and Cohen's kappa coefficient.
The best results in evaluation of the mechanism of the injury were demonstrated by the group of doctors from the Orthopaedic Hospital with an accuracy of 78.8% ($P<0.05$) and with an average correlation ($K = 0.598$). The best description of the injury was presented by the doctors from Siena with 87% accuracy ($P<0.05$) and with correlation ($K=0.749$). The doctors from Siena responded best at evaluating the neurological status with 97.6% accuracy ($P<0.05$) and with correlation ($K=0.936$). The assessment of the injury of the PCL residents from Siena was 64.7% accurate ($P<0.05$) with correlation ($K=0.426$). The total TLISS score was best calculated by the residents of Siena with 82% accuracy ($P<0.05$) and correlation ($K=0.718$). The most appropriate therapeutic decision was made by the residents from Siena with 80.3% accuracy ($P<0.05$) and with correlation ($K =0.707$).

Conclusion. Currently, the Denis classification and the AO classification are the most widely used classification algorithms for the fractures of thoracolumbar spine but some defects have also been identified in both of them. The value of TLISS evaluation is by the three groups of residents in presented 24 patients from the professional literature. Significant differences in accuracy were found in defining a real damage of the spinal cord at the level of the cauda equina. The evaluation of the integrity of the posterior longitudinal ligament by the radiography is of low accuracy.

Key Words: spine fractures, thoracolumbar spine, TLISS, education.

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Introduction

One of the proven facts in medicine, based on the evidences (EBM), is that the patients with the thoracolumbar spine injury, if the injury is indicated for the surgical treatment, should be given a surgical intervention and the fracture must be stabilized within 24 hours after the injury (17,18). It is up to the orthopaedists and traumatologists working in the institutions without a spine surgeon or a surgeon dealing with the spinal column injuries to decide whether a patient should be directed for a nonoperative or operative treatment. For that reason, the orthopaedists must have a broad theoretical knowledge regarding the injuries of the spinal column. In an attempt to reduce the variability and improve the result in evaluation and indications for the treatment of such injuries, Vaccaro and his co-workers showed in their study that, even though there are other classifications in use, the TLISS (Thoracolumbar Injury Severity Score) still presents a good reference for the medicine and specialist education of the orthopaedists and traumatologists. The aim of this study is to evaluate if the TLISS classification is an adequate classification when it comes to the thoracolumbar spinal injuries, as well as to determine if it is still a good base for the education of orthopaedists and traumatologists.

Patients and Methods

Six residents in Orthopaedics and Traumatology from the Polyclinic "Santa Maria alle Scotte" were given the material with the following topics: anatomy and biomechanics of the spinal column, classification of the thoracolumbar fractures, classification of thoracolumbar spine fractures TLISS, neurological outcome of the operative and nonoperative treatment of spinal column injuries. The same material was also distributed to the 5 residents in Orthopaedics and Traumatology at the Clinical Centre Banja Luka, Bosnia and Herzegovina, while the 5 residents in Orthopaedics and Traumatology from the Orthopaedic Hospital Alta Val d'Elsa were only given the works explaining what TLISS is. This classification was chosen because, among other things, it considers the mechanism of the injury, otfen not included in an anamnesis taken by a surgeon. In our work we introduced residents with 24 clinical cases published in PubMed and professional journals specialized in spinal column, etc. Even though our Institution has the Center for Spinal Surgery within its own structures, we didn't have a sufficient number of patients for this study. The following were taken into consideration: patient's age, neurological status and the description of the mechanism of injury. All patients were shown on standard radiographies in two projections, as well as on CT and MR in the sagittal projection in T2 sequence. The abovementioned 24 patients were chosen from the literature based on the criteria of injuries mainly seen by an orthopaedist inexperienced in problems of spinal column trauma (low energy trauma, with partial or without neurological impairments, with the TLISS score of 4). The residents from the three groups had to classify all patients according to the TLISS score and to define the most appropriate method of treatment-conservative or surgical, and after that, all classifications, as well as the therapeutic decisions, were compared among the groups of doctors mentioned .

Thoracolumbar spine injury classification TLISS objectifies the factors leading to the injuries and helps a spinal surgeon in choosing the most adequate treatment. The TLISS is based on three major factors of the thoracolumbar trauma: injury and the mechanism of injury, the integrity of the posterior longitudinal ligament (CLP) and patient's neurological status. The mechanism of injury and integrity of CLP are deduced from the observations of imaging studies including radiographies and / or MR of the thoracolumbar spine. Based on the scoring within these three factors, a total score is being calculated and it can be used to define an adequate therapy. Possible mechanisms of injury include compression, rotation and distraction. One to four points are awarded based on the mechanism of injury.

Patients with normal neurological status are given 0 points. Patients with an injury to the nerve root or a lesion of the spinal cord or cauda equina syndrome are awarded 1 to 3 points and these patients can benefit from surgical decompression.

The third major component of the TLISS algorithm also includes the assessment of the integrity of the posterior longitudinal ligament (CLP). The integrity of the CLP is determined by clinical examination and radiographies and / or by the CT and MR images (interspinal gap). Patient with an intact CLP is given 0 points. If a ligament is injured 3 points are awarded and if the status of the CLP is indeterminate 2 points are assigned.

The total score in the TLISS evaluation system evaluates the severity of the trauma and helps guide the decision between two choices: nonoperative or operative therapy.

Patients with a score less than or equal to 3 are indicated for the nonoperative treatment, while patients with a score greater than or equal to 5 are indicated for the surgical treatment, performed by the stabilization of fractures, with or without decompression. Patients with a total score of 4 fall in the category of the intermediates and the choice of therapy rests on the experience of the surgeon. The percentage of reliability of the evaluation system TLISS has been shown to be significant (the values of K are between 0.24 - 0.724). Recent studies prove a high reliability rate.

Table 1: TLISS algorithm

	Qualification	Points
I-Mechanism of injury		
Compressional	—	1
	Lateral angulation	1
	>15°	1
	Burst	1
Translational/rotational	—	3
Distractional	—	4
II-Neurological status		
Without impairments	—	0
Nerve root injury	—	2
Spinal cord injury (including the conus medullaris)	Incomplete	3
	Complete	2
Cauda equine syndrom	—	3
III- Integrity of the posterior longitudinal ligament (CLP)		
Intact	—	0
Suspected injury	—	2
Injured	—	3

The reliability and validity of the decisions on the method of treatment made by the TLISS system of the residents in Orthopaedics and Traumatology from Siena were compared with those made by the doctors from two control groups: a group of residents in Orthopaedics and Traumatology of the Orthopaedic Hospital from Siena and a group of residents in Orthopaedics and Traumatology of the Clinical Centre Banja Luka (BiH). The results were measured by Cohen's kappa coefficient. The Cohen's kappa coefficient is a measure accepted in the international studies and it quantifies the degree of agreement between observers in order to reduce the subjectivity.

This coefficient is between 0 and 1. 0 corresponds to an accidental correlation or a complete mismatch in tests, while 1 corresponds to a perfect correlation between the tests.

- from 0.00 to 0.20: minimal correlation
- from 0.21 to 0.40: slight correlation
- from 0.41 to 0.60: medium correlation
- from 0.61 to 0.80: significant correlation.
- from 0.81 to 1.00: perfect correlation

Results

Research results are presented in Table 2. The best results in evaluating the mechanism of injury were found in a group of doctors from the Orthopaedic Hospital with the accuracy of 78.8% (P<0.05) with an average correlation coefficient K=0.598. The best description of injury was presented by the residents from Siena with the accuracy of 87% (P<0.05) and with the correlation coefficient K=0.749. The doctors from Siena gave the best assesment of the neurological status with the accuracy of 97.6% (P<0.05) , with the correlation coefficient K=0.936. The assessment of the injury of PCL of the residents from Siena showed the accuracy of 64.7% (P<0,05), with the correlation coefficient K=0.426. The residents from Siena made the best calculation of the total TLISS score with the accuracy of 82% (P<0,05) and with the correlation coefficient K=0.718. The doctors from Siena also had the most adequate choice of therapy with the accuracy of 80.3% (P<0,05) and the correlation coefficient K=0.707.

Table 2. Results

	Percentage of accuracy	Cohen's Kappa
Mechanism of injury		
AOU Siena	76.1	0.580
Orthopaedic Hospital	78.8	0.598
Clinical Centre Banja Luka (BiH)	76.5	0.583
Classification of fractures	87.0*	0.749
AOU Siena	74.3	0.569
Orthopaedic Hospital	86.2	0.744
Clinical Centre Banja Luka (BiH)		
Neurological status		
AOU Siena	97.6*	0.936
Orthopaedic Hospital	94.6	0.907
Clinical Centre Banja Luka (BiH)	96.9	0.911
Integrity of the CLP		
AOU Siena	67.4*	0.426
Orthopaedic Hospital	63.4	0.400
Clinical Centre Banja Luka (BiH)	65.4	0.413
Total TLISS score		
AOU Siena	82.0*	0.718
Orthopaedic Hospital	77.8	0.581
Clinical Centre Banja Luka (BiH)	81.2	0.713
Choice of treatment		
AOU Siena	80.3*	0.707
Orthopaedic Hospital	73.7	0.562
Clinical Centre Banja Luka (BiH)	77.4	0.689

Discusion

The aim of the study was to establish whether a resident in Orthopaedics and Traumatology is able after his/her specialization to choose correctly the methods of treatment of thoracolumbar spine injuries. Empirically, we have discovered that this is a weak spot in their professional training.

Currently, both the Denis and the AO classifications are the most used classification algorithms for the fractures of thoracolumbar spine, but some defects have also been identified in both of them. The value of TLISS evaluation is by the three groups of residents in presented 24 patients from the professional literature.

By analyzing the data, we have received responses of the participants in the questionnaires, where the mechanism of the fracture occurrence was best described by the doctors who are able to understand it better due to their experience.

Conclusion

The previous study conducted by Vaccaro and his coworkers has already shown that the TLISS classification can be used for a correct diagnosis, as well as when it comes to choosing methods of treating thoracolumbar spine trauma. The most useful, but at the same time the most difficult for the decision, is TLISS = 4, where the decision on a method of treatment is based on the experience of a surgeon. This study offers encouraging results for the use of TLISS algorithm for the classification of thoracolumbar spine injuries, methods of treatment, as well as for the education of residents in Orthopaedics and Traumatology and surgeons who are not primarily involved in thoracolumbar spine injuries.

It is likely that the Thoracolumbar Injury Classification and Severity Score (TLICS) may be easier to use, but it is something that still needs to be investigated.

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Da li je Thoracolumbar Injury Severity Score (TLISS) još uvijek dobra osnova za edukaciju specijalizanata ortopedije i traumatologije

SAŽETAK

Uvod. Povrede torakolumbalne kičme koje su indikovane za hirurško liječenje potrebno je hirurški zbrinuti unutar 24 sata. Traumatolozi zaposleni u ustanovama koje nemaju spinalni odjel moraju biti u stanju da klasifikuju takvu povredu i da postave indikaciju za hirurško, odnosno neoperativno liječenje. Cilj ove studije je da utvrdi da li je Thoracolumbar Injury Severity Score (TLISS) još uvijek dobra osnova za klasifikaciju povreda torakolumbalne kičme i postavljanje pravilne indikacije za neoperativno, odnosno, hirurško liječenje.

Ispitanici i metode. Šest specijalizanata ortopedije i traumatologije iz Siene (Italija), pet specijalizanata ortopedije i traumatologije iz Kliničkog Centra Banja Luka (Bosna i Hercegovina) i pet specijalizanata ortopedije i traumatologije iz bolnice Alta Val d'Elsa, Siena (Italija) prezentovano je 24 klinička slučaja iz stručne literature gdje su prikazani sljedeći podaci: dob pacijenta, neurološki status pacijenta, opis povrede, mehanizam povrede i radiološki nalazi (RTG, MR). Navedena 24 pacijenta izabrani su iz literature po kriterijumu povreda koje najčešće viđa ortoped neiskusan sa problematikom traume kičmenog stuba (trauma niske energije, sa djelimičnim ili bez neuroloških ispada sa TLISS skorom 4). Specijalizanti iz tri navedene grupe trebali su da sve pacijente klasifikuju prema TLISS skoru i da odrede najprikladniji način liječenja - konzervativno ili hirurško, a zatim je vršeno poređenje klasifikacija i terapijskih odluka među navedenim grupama ljekara. Statistički metodi korišteni u ovoj studiji su: statistička značajnost, pouzdanost (P<0.05), validnost odluke, procenat tačnosti i Kappa-Cohenov koeficijent.
Najbolji rezultati kod ocjenjivanja mehanizma povrede bili su u grupi ljekara Ortopedske bolnice sa tačnošću od 78,8% (P<0,05) i uz prosječnu korelaciju (K=0,598). Najbolji opis povrede predstavljen je od strane doktora iz Siene sa 87% tačnosti (P<0,05) i korelaciju (K=0,749). Doktori iz Siene dali su najbolju ocjenu neurološkog statusa sa 97,6% tačnosti (P<0,05) i korelacijom (K=0,936). Procjena povrede PCL specijalizanata iz Siene bila je sa 64,7% tačnosti (P<0,05) i sa korelacijom (K=0,426).
Ukupan TLISS rezultat je najbolje izračunat od strane specijalizanata iz Siene sa 82% tačnosti (P<0,05) i korelacijom (K=0,718). Najadekvatniji izbor terapije imali su doktori iz Siene sa 80,3% tačnosti (P<0,05) i korelacijom (K=0,707).

Zaključak. Trenutno su Denisova i AO klasifikacija najčešće korišćeni klasifikacijski algoritmi za prelome torakolumbalne kičme, ali su uočeni i određeni nedostaci u obje ove klasifikacije. Vrijednost TLISS ocijenjivana je od strane tri grupe specijalizanata kod prezentovana 24 pacijenta iz stručne literature. Značajne razlike u tačnosti pronađene su u određivanju stvarnog oštećenja kičmene moždine u nivou caude equine. Procjena integriteta zadnjeg longitudinalnog ligamenta (CLP) pomoću radiografije je niske tačnosti.

Ključne riječi: prelom kičme, torakolumbalna kičma, TLISS, edukacija

CASE REPORT

UDK 616.366-003.7-089.878

Chronic Recurrent Biliary Ascites: An Unusual Scenario

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ABSTRACT

Biliary ascites in adults occurs most often as a complication of biliary procedures - endoscopic, radiologic or operative, but can occur after trauma as well. Once suspected, evaluation should include diagnostic paracentesis to determine the ascitic fluid bilirubin level as well as HIDA scanning or MRCP to rule out extravasation from the biliary tree. Treatment is directed primarily at surgical repair of the injury/defect or decompression of the biliary tree. To our knowledge, chronic recurrent painless slowly accumulating biliary ascites with no preceding history of biliary obstruction/ surgery or trauma has never been reported before.

Keywords: biliary ascites, ascites

DOI: 10.7251/SMD1402073K

(Scr Med 2014:45:78-80)

Submitted: April 15th, 2014
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Case Report

A 44-year-old Hispanic lady was admitted to the general medicine floor for recurrent painless abdominal distention. She gave a history of recurrent abdominal fluid collection for five years. She had therapeutic paracentesis performed every six months with drainage of green fluid at an outside hospital with no established etiology. Her past history was significant for infertility treated with laparoscopic lysis of adhesions nine years before presentation, which was complicated by injury to the iliac artery in the pelvis that was surgically repaired at the same time. She had two successful *in vitro* fertilizations four years apart and the ascites started three years after the second pregnancy. She had regular menstrual cycles, denied any history of trauma, other gastrointestinal complaints. Review of systems was otherwise unremarkable. She had no family history or risk factors for tuberculosis. On physical examination her vital signs were normal, chest was clear to auscultation, heart sounds were normal with no murmurs, rubs or gallops, a normal neurologic exam and no peripheral edema. The abdomen was soft, non-tender but clearly distended with no organomegaly but positive fluid thrill. A complete blood count, metabolic profile and liver function tests were normal. A CT scan of the abdomen showed ascites with normal liver, spleen, pancreas, biliary system, bowel and pelvic organs and no abnormal masses anywhere. A carcinoembryonic antigen, CA-125 and CA19-9 tumor marker levels were normal. Acute and chronic hepatitis panel was negative. A total of 2.5 liters of ascitic fluid was drained and it was dark green in color (Figure 1, 2).

Figure 1: Green color ascites

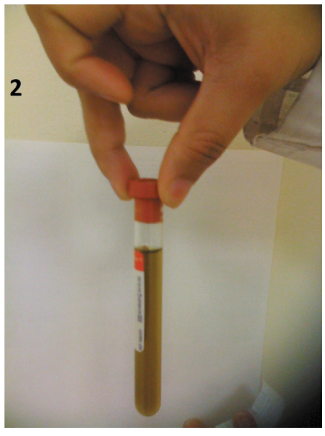

Figure 2: Same drained ascites

Fluid analysis showed a low serum-ascites albumin gradient (SAAG) of 0.85 g/dL, total protein in the fluid of 4.6 g/dL, 247 white cells with 27% neutrophils, LDH 99 U/L (serum LDH 140 U/L) and fluid bilirubin of 1.4 mg/dL (serum total bilirubin of 0.5 mg/dL). Fluid cultures for bacteria, acid-fast bacilli and fungi were negative and the fluid cytology was negative for any malignant cells. Fluid smears were negative for mucin stain. An MRCP showed no pancreatico-biliary ductal dilatation or leak. A HIDA scan did not show any evidence of a biliary leak, cholecystitis or common bile duct obstruction. A transvaginal ultrasound showed normal ovaries. After fluid drainage she felt better and was discharged with outpatient follow up. She visited her primary physician every 3 months and had recurrence of ascites that needed drainage 2-3 times a year and is doing well 3.5 years post presentation to us.

Discussion

Acute free escape of bile into the peritoneal cavity in adults generally is considered to be a serious situation with a high mortality rate, a condition known as bile peritonitis, occurring after spontaneous perforation of the gallbladder or hepatic ducts or occasionally after blunt trauma. However, a less symptomatic version, known as bile ascites, is most commonly a postoperative complication of biliary tract operations or trauma.[1,2] Biliary procedures such as cholecystectomy, especially performed for acute cholecystitis, carry the greatest risk of biliary leak from the cystic duct or an unrecognized duct of Luschka with patients usually presenting with bile ascites or bile peritonitis within a week of the procedure. [3] Bile ascites is associated with sterile peritoneal fluid whereas bile peritonitis can have bacterial growth on cultures in over 40%.[4] Our understanding of the association of the bile salt concentration and bacteria in the development of bile peritonitis is still imprecise but the initial insult by the bile is chemical, followed by a secondary bacterial infection. The longer the period before the bile is drained, the higher the incidence of infection and the greater the likelihood that peritonitis will develop. [3] Bile ascites has been reported usually in children and known to occur as a complication of rupture of congenital choledochal cyst or blunt trauma. [4] In adults it is a predominantly surgical complication; however, the reports of large bile ascites with no signs of peritonitis are invariably due to bile leak from the biliary tree and treated with surgical repair in most cases. [1,5]

Upon paracentesis the fluid may look green or brown, is exudative (serum-ascites albumin gradient <1.1 g/dL) and on biochemical analysis has a fluid to serum bilirubin ratio of >1 which is characteristic. Ascitic fluid amylase and lipase should also be checked to evaluate for ascites secondary to pancreatitis. [6,7] Hepatobiliary scintigraphy confirms that the intraperitoneal fluid is bile without the need for paracentesis and may show the site of perforation. It is a very useful noninvasive imaging modality and should be done in all suspected patients. It is also useful in the follow-up of treated patients to know the treatment response. Intraoperative cholangiography can also be done to confirm the diagnosis, document the site of perforation, and guide management.[8,9] Treatment depends on the location of bile leakage and etiology. In our patient, no source of biliary leak was identified and work-up for malignancy or infective etiology was negative. She was followed clinically after paracentesis and continued to do well with no signs of peritonitis or reaccumulation at her last checkup.

Conclusion

Most cases of biliary ascites in adults develop due to biliary rupture or leakage. However, to our knowledge, our patient is the only reported case of chronic recurrent painless biliary ascites in an adult with no associated risk factors of trauma or biliary manipulation/obstruction.

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Hronični, povratni žučni ascit: neobičan scenario

SAŽETAK
Žučni ascit kod odraslih osoba najčešće se javlja u vidu komplikacija žučnih procedura – endoskopskih, radioloških ili operativnih, ali može se javiti i nakon traume. Čim se posumnja na žučni ascit, procjena bi trebala da obuhvati dijagnostičku paracentezu kako bi se odredio nivo bilirubina u ascitnoj tečnosti, kao i HIDA skeniranje ili MRCP, kako bi se isključila ekstravazacija iz žučnog stabla. Liječenje je prvenstveno usmjereno na hiruršku korekciju povrede/nedostatka ili sniženje pritiska žučnog stabla. Koliko je nama poznato, hronični, povratni, bezbolni žučni ascit koji se polako nakuplja, pri čemu ne postoji prethodna istorija žučne opstrukcije/operacije ili trauma, nikada do sada nije prijavljen.

Ključne riječi: žučni ascit, ascit

CASE REPORT

UDK 616-007.43-089

Obturator Hernia With Meckel's Diverticulum In Hernial Sac

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ABSTRACT:

Obturator hernia rarely occurs; it represents less than 2% of all abdominal hernias. It is a protrusion of the preperitoneal fat tissue or peritoneal defect through the obturator channel. Rule is that it is a disease of skinny, older women (seventh or eighth decades), usually multiparous, predominantly right-sided, usually incarcerated, rarely diagnosed preoperatively. The clinical diagnosis is rarely set due to the unclear signs and symptoms. Because of the delayed diagnosis the postoperative morbidity and mortality is significantly increased. CT of the pelvis is almost 100% accurate in the diagnosis of the obturator hernias and should be the modality of choice in elderly patients with the bowel obstruction of an unknown etiology. We report a case of a 70 -year- old woman who had been admitted to our department on several occasions due to the suboclusive problems and the obturator hernia with a Meckel's diverticulum was verified intraoperatively.

Keywords: obturator hernia, Meckel's diverticulum, computed tomography

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Submitted: May, 3rd, 2014
Accepted: May, 29th, 2014

Case Report

A 70-year-old woman was admitted to the surgical department with the clinical picture of ileus. She had been admitted to our department on several occasions due to the suboclusive problems and occasional abdominal pain. Then we did a CT and the abdominal ultrasound, but did not reveal the cause of the problems. The pain extended to the right hip and the right thigh; she was treated conservatively each time and sent home. This time, the native RTG of abdomen showed hydroaeric levels. We performed an emergency surgery, and a herniation of the small intestine through the obturator channel with a Meckel's diverticulum in hernia sac was diagnosed intraoperatively (Figure 1). Hernia sac was prepared and resected from the inside, and the resection of Meckel's diverticulum with a part of the small intestine was also performed, with the rapid postoperative recovery of the patient.

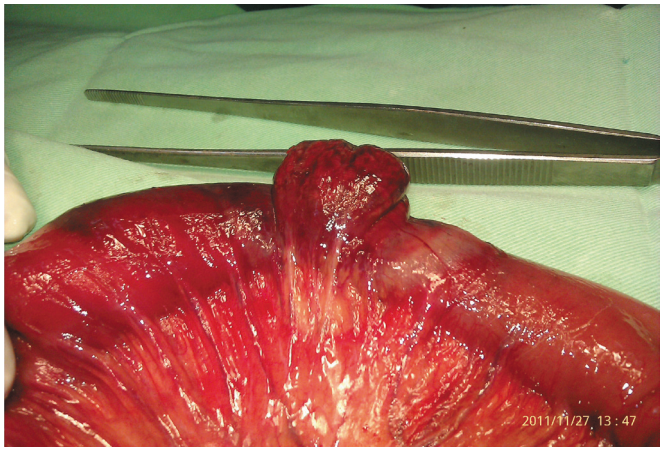

Figure 1. Meckel's diverticulum with a part of the small intestine˝which was in hernia sac

Discussion

Obturator hernias are rare, representing 0.07-1.41% of all hernias. Older women with chronic diseases are more susceptible to entrapment. Clinical findings are usually non-specific and a correct preoperative diagnosis is rarely placed on the basis of the clinical findings[2]. A lack of precise preoperative diagnosis leads to a delayed intervention, resulting in a high rate of bowel resection and the mortality greater than 25% in some studies [3]. Clinically, specific signs, such as Howship-Romberg sign (positive patellar reflex) or Hannington-Kiff sign (the loss of the thigh adductor reflex) are rarely present or not detected in these patients [4]. CT of pelvis with oral and iv contrast is a very useful diagnostic tool in cases of clinically indeterminate obstruction of the small intestine as well as in obturator hernias. CT shows classic signs of bowel obstruction through the foramen obturatum and was successful in all six cases of studies [5]. Another study also found that CT was 100% accurate in the diagnosis of obturator hernias [6]. Most of the research so far has revealed a closed small part of the bowel, especially the ileum, within the hernia sac.

Our case is unique because, apart from the small intensine, the content of the hernia sac was also made up of Meckel's diverticulum which was resected. Hernia sac was prepared and resected from the inside and with a rapid postoperative recovery of the patient the treatment was successfully completed.

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Obturatorna kila sa Meckelovim divertikulumom u kilnoj kesi

SAŽETAK:
Obturatorna kila se rijetko javlja; predstavlja manje od 2% svih abdominalnih kila. To je protruzija preperitonealnog masnog tkiva ili peritonealne kese kroz obturatorni kanal. Važi pravilo da je to oboljenje mršavih, starijih žena (sedma ili osma decenija), najčešće višerotki, pretežno desnostrana, obično inkarcerirana, rijetko preoperativno dijagnostikovana. Klinička dijagnoza se rijetko postavlja zbog nejasnih znakova i simptoma. Zbog zakašnjele dijagnoze značajno se povećava postoperativni morbiditet i mortalitet. CT karlice je skoro 100% tačan u dijagnostici obturatornih hernija i treba da bude modalitet izbora kod starijih pacijenata sa opstrukcijom crijeva nepoznate etiologije. Prikazujemo slučaj 70- godišnje starice koja je u više navrata ležala na našem odjeljenju zbog subokluzivnih tegoba, a intraoperativno joj je verifikovana obturatorna kila sa Meckelovim divertikulomom u njoj.

Ključne reči: obturatorna kila, Meckelov divertikulum, kompjuterizovana tomografija

CASE REPORT

UDK˝ 616.833.17-085

Melkersson-Rosenthal Syndrome

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ABSTRACT

Melkersson-Rosenthal syndrome (MRS) is manifested by recurrent edema in the region of the face or oral cavity, paralysis of facial muscles and fissured tongue. It is a rare, granulomatous disease of unknown cause. We report a case of a patient with the complete clinical triad of MRS symptoms.

KEY WORDS: Melkersson-Rosenthal syndrome, nervus facialis, facial edema, fissured tongue

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Submitted: September 20th, 2014
Accepted: September 24th, 2014

Introduction

Melkersson-Rosenthal syndrome (MRS) or Miescher-Melkersson-Rosenthal syndrome is a rare neurological disease manifested by a triad of symptoms: recurrent (unilateral or bilateral) peripheral facial nerve palsy, relapsed swelling of one side of the face, eyelids or lips and fissured tongue.

It was first described in 1928 by Ernst Gustav Melkersson who described a paralysis and facial edema, whilst in 1932 Curt Rosenthal added lingua plicata or fissured tongue as an additional symptom to the previously mentioned relapsing symptoms[1]. In 1945 Miescher introduced several cases of primary interstitial inflammation of the lips, along with the abovementioned symptoms, and named them macrocheilitis granulomatosa.[2]

Case Report

A 32-year-old female patient (she gave a written authorization to use her medical information and photographs) was hospitalized at the Neurology Clinic, University Hospital – Clinical Centre of Banja Luka because of the recurrent bilateral peripheral facial palsy, swollen lower lip (Figure 1), fissured tongue (Figure 2) and a headache.

Anamnestically we received the information that she had left-sided peripheral facial nerve palsy first time at the age of 25, during her pregnancy, but it withdrew spontaneously without neurological deficit. Five years later (at the age of 30) she had a right-sided peripheral facial nerve palsy, which was treated with antibiotics and corticosteroids, and this, together with the physical therapy, led to the partial improvement. Eighteen months later right-sided peripheral facial nerve palsy recurred and six months after that the left-sided peripheral facial nerve palsy also recurred, this time followed by taste disorder, pronounced salivation and tearing, as well as the periodic headache on left side of migraine character. The last attack occurred three months before she was hospitalized in our clinic. After oral corticosteroid therapy and physical treatment there was a small improvement of the weakness of the mimic muscles. The intensity of a headache significantly decreased in the last recidive of the disease with the use of tricyclic antidepressants, and after a month it completely stopped, while in the same period, both hypersalivation and epiphora withdrew, and the sense of taste got normalized. Swelling of the lower lip occurred on several occasions, regardless the weakness of the mimic musculature, and was sometimes accompanied by the feeling of general weakness and febrility, and after the second recidive there was a more voluminous lower lip of harder consistency then the previous. Fissured tongue was noticed in early childhood.

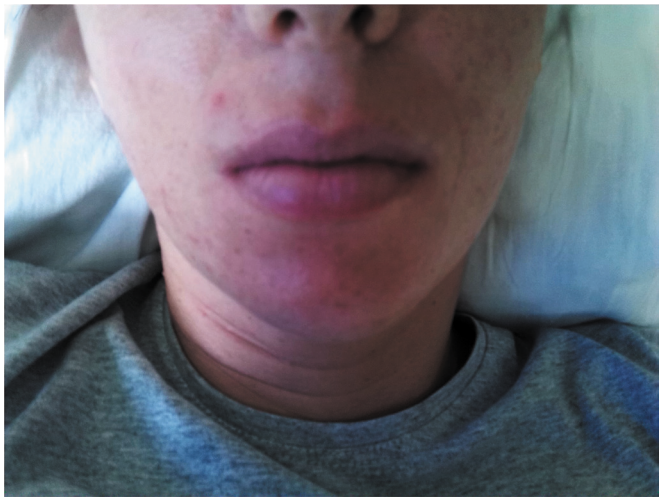

Figure 1. Bilateral facial nerve palsy

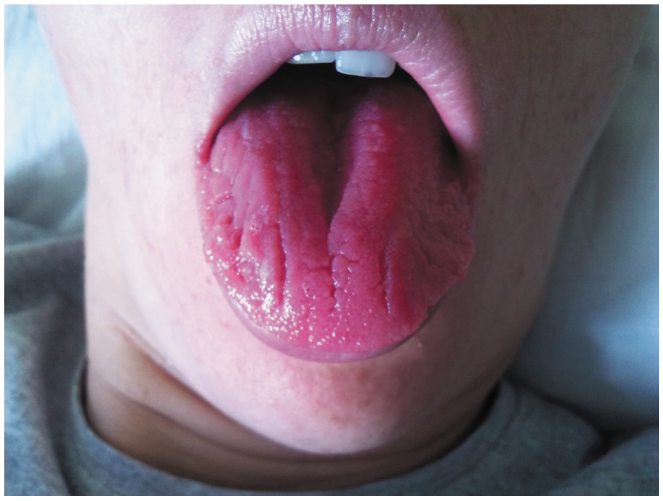

Figure 2. Melkersson-Rosenthal syndrome-fissured tongue

The family anamnesis gave significant information regarding the father who, at the age of 40, had a peripheral facial nerve palsy, which didn't occur again, and he is also the only one in the family, apart for our patient, with a fissured tongue. The personal anamnesis showed neither previous diseases, operations, injuries nor allergic reactions.

Within the diagnostic process recommended by the authorized neurologist, laboratory analysis were conducted at the medical clinic where complete blood count was made on several occasions, as well as the biochemical analyses and inflammation parameters, which were normal. IgM and IgG antibodies to Borrelia burgdorferi in serum by Western blot method were negative, and the level of serum angiotensin-converting enzyme was normal. Otorhinolaryngological, ophthalmological and the internist's tests were all normal on several occasions.

Biochemical blood analysis, thyroid hormonal status, cyto-biochemical analysis of the liquors and immune analysis of serum done during the hospitalization at our institution were within the limits of the reference values and negative. Abdominal ultrasound examination and x-ray of the heart and lungs were NAD. Electromioneurographic findings showed a hard lesion of the facial nerve to the right of the foramen stylomastoideum with the damage of the fibers m. orbicularis oris and m. orbicularis oculi of strong degree and in the same regions on the left side, the changes of a modest degree were registered. Visual evoked potentials showed normal results, while brainstem auditory evoked potentials showed normal results after stimulation to the left side and possible disturbance in the area of the brainstem after stimulation to the right side. MR endocranium and cervical spine MR were conducted two times in 2012 and in 2013 and showed normal findings.

The neurological examination of the patient (7 years after the first symptoms) found a bilateral peripheral facial nerve palsy more on the right side with the presence of Bell's phenomenon and the synkinetic movements in the form of the removal of the right nasolabial fold while closing eyes, and opening of an eye while showing teeth, on the same side. A weak contraction of the platysma is bilaterally registered, more on the right side. Tongue examination showed a fissured tongue with dominant groove/fissure in the middle and pronounced transverse grooves, as well as the discrete tremors on protrusion. The lower lip is more voluminous, dominant in the central area, with a discrete hyperpigmentation in that area, and also of harder consistency in response to palpation, in comparison to the upper lip. The rest of the neurological finding was normal.

Discussion

MRS is a rare neurological disease that affects both sexes, most commonly in the second or third decade of life, but there have been cases when patients had their first symptoms in childhood or when they were older than 50. [2] Information on incidence is inconsistent but is about 0.3. per 100 000 patients per year.[3]

It is manifested by a triad of symptoms: recurrent (unilateral or bilateral) peripheral facial nerve palsy, recurrent swelling of one side of the face, eyelids or lips (cheilitis granulomatosa-Miescher cheilitis) and fissured tongue (lingua plicata). In only 25% of cases all three symptoms are present at the same time, which, with the variation of the symptoms mentioned through the time (from several days to several years), makes the diagnostic process much harder.[4] So far, the etiology is not clear enough, but it is assumed that it may be a genetic predisposition, infectious cause or an immune response to some of the agents from the outside.

In patients with the sign of a fissured tongue it is assumed to be a congenital disease since this characteristic is present in several members of the same family and without other symptoms.[5]

It is often coexistent with Crohn's disease and sarcoidosis, as well as with Hashimoto's thyroiditis.[6] Histopathologically, it is a granulomatous angiitis with perivascular inflammatory cells and accompanying tissue edema.[7]

The diagnosis is made based on the clinical features and by excluding other autoimmune and infectious diseases with similar symptoms and, in cases that are still not clear, it can include a biopsy and pathohistolic analysis of the affected tissue and the genetic analysis.[8]

MRS has a chronic course accompanied by the relapses and remissions, with occasional spontaneous recovery, aided by certain symptomatic procedures.[9]

Since the etiology is not known enough, the therapy includes a local and/or systemic use of corticosteroids, analgesics, in rare cases imunosupressives and antibiotics, as well as the physical treatment.

There have been successful examples of treating swelling of the lips by the local parenteral application of betamethasone and doxicicline with the previous application of anesthetics, once a month, during the period of three years, as well as by the use of adalimumab in the recent times.[10] If the swelling of the eyelid is severe, does not react on therapy, functionally disturbs a patient or if it is unacceptable in cosmetic terms, a surgical treatment like aesthetic correction can be applied, but also a facial nerve decompression especially in the cases in which, by neurophysiological methods, we can detect the place of compression and when there is a denervation. [11,12]

With this report we wanted to indicate the MRS as one of the possible causes of bilateral, peripheral damage of the facial nerve, which is necessary to distinguish from some other possible causes of this disorder such as multiple sclerosis, neuroborreliosis, neurosarcoidosis and acute polyradiculoneuritis. Apart for the normal findings of laboratory and neuroradiological analyses, a characteristic triad of symptoms points to the MSR as an independent entity.

It is also important to pay attention to this disease because it is highly likely that, apart for the neurologists, there are other doctors of different fields of specialty participating in its diagnosis and treatment (ORL specialists, pediatricians, ophthalmologists, dermatologists, rheumatologists, physiatrists) and that, given the low incidence, unclear etiology and uncertain outcome of the natural course of the disease, the early detection and the start of the symptomatic therapy is of great importance for the better functional recovery.

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Melkersson-Rosenthal sindrom

SAŽETAK
Melkersson-Rosenthal sindrom (MRS) manifestuje se rekurentnim edemom u regiji lica ili usne duplje, paralizom mišića lica, izbrazdanim jezikom. To je rijetka granulomatozna bolest nepoznatog uzroka. Prikazali smo slučaj pacijentice sa kompletnom kliničkom trijadom simptoma MRS-a.

KLJUČNE RIJEČI: Melkersson-Rosenthal sindrom, nervus facialis, edem lica, izbrazdan

CASE REPORT

UDK 616.831-005-073

Ultrasonographic Assessment Of Collateral Cerebral Circulation In Patient With Internal Carotid Artery Occlusion

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ABSTRACT

Cerebrovascular diseases represent a serious global health problem. They are the leading cause of disability and second cause of death worldwide. Identification of risk factors and early diagnosis allow prompt prevention and treatment. Group of authors, through a case report of a patient with a symptomatic internal carotid artery occlusion and an overview of diagnostic and therapeutic protocol, alludes to the advantages of ultrasonographic diagnosis not only with diagnosis itself but with the subsequent patient's follow-up. Ultrasonographic diagnosis is completely sufficient with respect to more expensive and invasive diagnostic procedures and it provides a complete insight of brain circulation in real time. When it comes to the assessment of collateral brain circulation, ultrasonographic diagnosis is the method of choice.

KEY WORDS: Color Doppler Ultrasound, occlusion, internal carotid artery, collateral cerebral circulation

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Introduction

Cerebrovascular diseases represent a serious public health problem. They are the leading cause of disability and second cause of death worldwide. [1]

The World Health Organization defines stroke as rapid development of clinical signs in terms of focal or global disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, without any other apparent cause other than signs of blood vessel damage.

We differentiate two types of stroke , and these are *ischemic* - due to thrombosis , emboli , or systemic hypoperfusion (80% of cases), and *hemorrhagic* which causes bleeding (20 %) . Approximately 50 % of ischemic strokes are related to atherosclerotic disease of the intracranial or extracranial parts of the carotid artery.[2]

The atherosclerotic disease of extracranial carotid artery itself is responsible for about 15 to 20 % of ischemic strokes.[3]

The annual incidence rate for occlusion of the internal carotid artery is 6/100000 residents.[4]

Age, arterial hypertension, cigarette smoking, hyperlipidemia, diabetes, gender, and fibrinogen are the main risk factors for development of the atherosclerotic process in the carotid vessels, and they also correlate with the severity of stenosis. [1, 5-7]

Ultrasonographic monitoring is the most important diagnostic tool in stenosis - occlusion monitoring, as well as in controlling the establishment of collateral cerebral circulation. [8]

A case report

Patient S.A., aged 56, male, was examined in a walk-in neurology center at 11: 40h. On the same day, at about 10: 10 am, the patient felt a sudden weakness in his left arm and left leg. During the ambulance transport to the clinic, the deficit had withdrawn from bold to mild (NIHSS 2), and on the initial examination, the patient only complained of headache in the right frontal region. Immediately upon the reception, the patient was referred to CT analysis of endocranium whish shows only separate microvascular ischemic lesions in the region of internal capsule, subcortinal, insular bilaterally (Figure 1.).

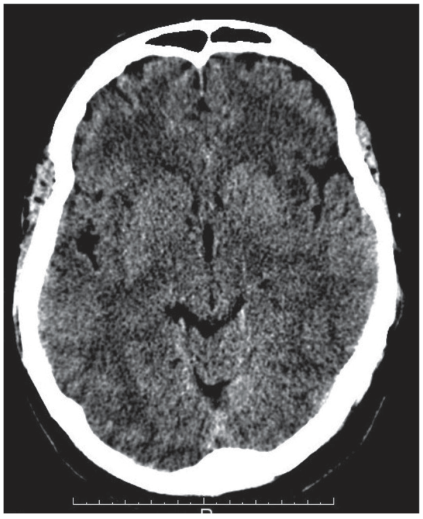

Figure 1. Ct analysis of endocranium before thrombolysis - normal findings

After returning from the CT, once again, the plegia of the left extremities occurred , and the protocol for thrombolysis, within which laboratory analysis was done, was immediately initiated (Tr 179: INR 1.08 : APTT 28.8 " : blood sugar 5.85) and TCCD : Occlusion ACI dex (in syphon) vsml .

The neurological status upon the admission to the stroke unit showed deviation of the head and right side look, the central facioparesis on the left, with dysphasia and plegia of the left extremities RANKIN 5 , NIHSS 16).

Uncontrolled hypertension and atherosclerotic altered vessels were the sole identified risk factors.

Since all inclusion criteria stipulated by the protocol were fulfilled, therapy at a dose of 0.9mg / kg body weight, with a total dose of 90 mg, that being the maximum dose (the patient weighs 112 kg) was given. After receiving thrombolytic therapy, partial withdrawal of neurological deficit occurred and diagnosis, symptomatic treatment and secondary prevention of stroke continued in postliminary hospitalization.

The next day of hospitalization, the CT of the head was repeated and it showed acute ischemic lesions in supratentorial, frontoparietal and the right posterior (Figure 2.).

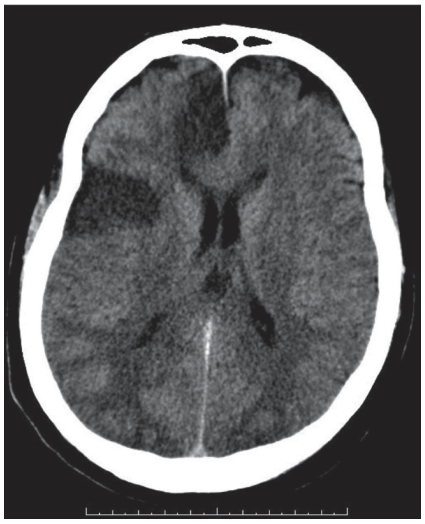

Figure 2. Ct scan after thrombolysis - a heart attack in the area of vascularization of ACA and right MCA

Furthermore, the CTA of blood vessels of the head was done and the scan showed the occlusion by soft tissue thrombus of distal two-thirds of the cervical segment of the right ICA with minimal filiform display as the consequence of retrograde flow. In the petrous part there was no flow-total occlusion (Figure 3.) .

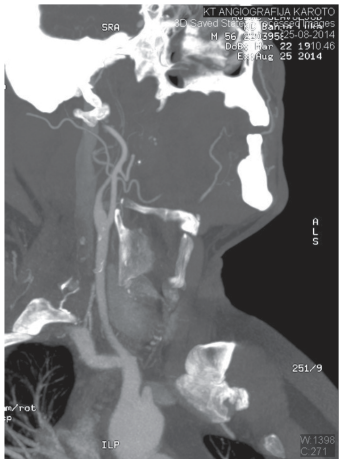

Figure 3. CTA of the neck – occlusion of the right ACI (in syphon)

As the method of choice in the follow-up of the cerebral circulation, we chose TCCD which showed that the internal carotid artery (in the syphon), with a developed collateral circulation through posterior communicant artery and equilateral ophthalmic arteries was still present (Figure 4.).

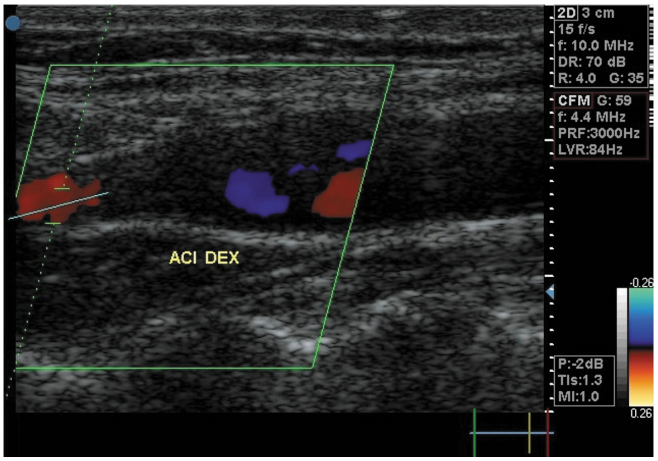

Figure 4. Right ACI immediately after the birufication

In addition to thrombolytic therapy, the patient was treated with infusions of rehydration solutions, low molecular weight heparin, antiagregantes, antihypertensives, sedatives, and antibiotics due to uroinfect.

Under the supervision of a physiatrist, intrahospital early physical therapy began, and on the 14th day of hospitalization, the patient was discharged in order to continue his early rehabilitation in the Institute of Physical Medicine and Rehabilitation "Dr Miroslav Zotović" Banja Luka. At the discharge, the neurological examination showed a tail of severe left-sided hemiparesis with partial functional recovery (RANKIN 5; NIHSS 9), together with a well-developed collateral circulation via the posterior communicant artery and the equilateral ophthalmic artery.

Discussion

Ultrasonographic displey of the carotid vessels is non-invasive and objective method for the evaluation of cerebral hemodynamics. Extracranial Color Doppler provides important information regarding the state of the carotid and vertebral arteries, intima - media complex thickness (IMT - intima media thickness) as an important indicator for the development of atherosclerosis - accommodation, position, length, layout and content of the plaque.

Ultrasonography can accurately estimate the degree of stenosis of the carotid artery, which is correlated with angiographic findings obtained using DSA or MSCT (these techniques bring certain percentage of complications). Accordingly, this method should be used exclusively in patients in whom stenosis of sonographic carotid artery fails to be adequately neurosonologicaly displayed. In the case of pseudo occlusion probably due to the density of contrast, angiography is not sensitive enough in relation to ultrasound. Then the Power Doppler may be used.

Additional advantage of an ultrasound is the possibility to measure the flow rate in a blood vessel itself, but also in collateral brain circulation. Doppler findings best correlate with DSA, whereas in the studies where the correlation with the macroscopic findings after the surgical treatment has been monitored, it has been proven that MSCTA underestimates the degree of stenosis, while MRA overestimates it.[9,10]

In this precise case report described by the authors, ultrasound is the method of choice not only in diagnosis but in the follow-up as well. They made an appointment for ultrasonography check-up of the patient in 3 months.

Conclusion

After the thrombolytic therapy in the presented case report, there was no sign of recanalization of the vessel but the establishment of described collateral circulation and partial functional recovery occurred.

The presented case report showed that the ultrasound findings correlated to the findings of more sophisticated, more invasive and expensive procedures.

Screening programs for the evaluation of asymptomatic carotid disease, based on ultrasonographic display, are of great significance for the primary prevention of stroke, and thereby for reduction of the specific rate of mortality and disability.

Ultrasonographic diagnosis is completely sufficient in relation to more expensive and invasive diagnostic procedures and it provides a complete insight into the state of the cerebral circulation in real time.

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Ultrasonografsko praćenje kolateralne moždane cirkulacije kod pacijenta sa okluzijom unutrašnje karotidne arterije

SAŽETAK

Cerebrovaskularne bolesti predstavljaju ozbiljan globalni zdravstveni problem. Na prvom su mjestu kao uzrok invaliditeta, a na drugom kao uzrok smrti u svjetskoj populaciji. Identifikacija faktora rizika i rana dijagnostika omogućavaju prevenciju i pravovremeno liječenje. Grupa autora, kroz prikaz slučaja pacijenta sa simptomatskom okluzijom unutrašnje karotidne arterije, te prikazom dijagnostičkog i terapijskog protokola, skreće pažnju na prednosti ultrasonografske dijagnostike kako u postavljanju dijagnoze tako i u daljem praćenju pacijenta. Ultrasonografska dijagnostika je potpuno suficijentna u odnosu na skuplje i invazivnije dijagnostičke procedure i pruža potpun uvid u stanje moždane cirkulacije u realnom vremenu. Ultrasonografska dijagnostika je je metoda izbora u procjeni kolateralne cirkulacije.

KLJUČNE RIJEČI:

kolor Dopler ultrazvuk, okluzija, unutrašnja karotidna arterija, kolateralna moždana cirkulacija

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