

"Bone marrows concentrate and demineralized bone matrix in the treatment of non unions"

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08.55 Tibio-talo-calcaneal arthrodesis using a curved intramedullary nail in patients presenting severe preoperative risk factors for delayed union or non-union

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Objectives: The main objective of the present study was to evaluate the success and clinical outcome of a tibio-talo-calcaneal arthrodesis using a curved intramedullary nail in patients presenting severe preoperative risk factors (diabetes, obesity, smoking, ...) for delayed union or non-union.

Material and Methods: This retrospective cohort study includes a total of 43 patients who underwent a tibio-talo-calcaneal arthrodesis using a curved intramedullary nail between 2007 and 2014. All patients were reviewed on a regular basis through chart review, clinical examination and radiological evaluation. The following variables were analyzed: pre- and postoperative Meary angle, union rate, time to union, type of bone graft and complications. The mean time to final follow-up was 17.16 months. Kolmogorov Smirnov test was used to determine whether the chosen variables were normally distributed. For comparisons of non-normally and normally distributed data, Wilcoxon tests, Mann-Whitney U tests or Student paired t-tests were used.

Results: Thirty-five of the 43 tibio-talo-calcaneal arthrodeses (81.40%) were considered radiographically fused after the first attempt in a mean time of 3.9 months. Bone graft was used in 30 patients. The most important complications include 2 superficial and 4 deep infections, 5 wound related problems, one tibial stress fracture, 5 delayed unions and 3 non-unions. The median Meary angle of the hindfoot was improved from pre-operatively 0.1 (range 26.7 varus to 25 valgus) to 4 degrees of valgus post-operatively (range 1.4 varus to 19.6 valgus) (p-value < 0.05).

Conclusion: Tibio-talo-calcaneal arthrodesis is a challenging procedure and has a reported union rate above 80% for open and arthroscopic procedure. Despite the presence of severe preoperative risk factors for delayed union or non-union, the results of the present series compare favourably with the literature.

09.05 Treatment of aseptic diaphyseal nonunion of the lower extremities with intramedullary nailing and blocking screws without autografting

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Objectives: Treatment of diaphyseal long bone nonunions is a challenging issue in orthopaedic practice. Iliac crest bone harvesting may cause pain and some sensorial deficiencies. Our hypothesis is that by increasing mechanical stability nonunions of long bones can be treated by intramedullary nailing alone.

Material and Method: In this study we treated 24 lower extremity (20 tibia, 4 femur) aseptic non-union with intramedullary nailing and blocking screws between 2010-2014. In last control we evaluate patients in terms of pseudoarthrosis union, union time, radiological malalignment and functional status.

Results: The average age of patients was 33.2 (23-56) years and mean follow up time was 21 months (14-48). Bony union was achieved in all patients within 3.2–10 months (average, 5.6 months). In two tibial nonunion patient osteomyelitis had developed and these two patient were treated by debridement and antibiotics. In one patient with femur pseudoarthrosis there was 10 degree recurvatum deformity. There are some mild ankle range of motion deformities in 3 patients.

Conclusion: The therapeutic method of nailing combined with blocking screws is effective for aseptic nonunion of the lower extremity. Blocking screws increase mechanical stability of the system. Infection is a major problem in these type of patients and antibiotic coated nails are better options for these group of patients. Reaming and minimal invasive surgery provide a healthy environment for union.

09.15 IL Bacteriophages as targeted antimicrobial in septic orthopaedics

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09.25 Bone marrows concentrate and demineralised bone matrix in the treatment of non unions

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Objectives: Non unions are difficult to treat situations. Iliac crest bone autografting represents a reference procedure when biological environment of the non-union is impaired. We wonder if iliac crest bone autografting can be replaced by autologous bone marrow concentrate (ABMC) implanted with demineralised bone matrix (DBM).

Material and methods: 53 patients have been treated for long bone non unions on a 6 year period with ABMC and DBM. Factors (patient comorbidities, tobacco use, fracture history, location, type of non-union, infection, bone resection with massive allograft, cellularity of the ABMC,...) influencing healing were registered. Fusion was assessed clinically (full weight bearing without complaints), radiographically by two independent observers and in case of doubt by a scanner. Statistical analysis has been performed with SPSS.

Results: fusion was observed in 72.7% after 17 +/- 9 months. Radiological assessment of fusion was well correlated between the two observers (kappa coefficient 0,925 ; P< 0,001). Fusion was negatively influenced by smoking (Odds ratio 3,4 ; p< 0.016). The delay between fracture and non-union treatment was the only negative independent factor (p<0.033). No complication was observed after iliac crest bone marrow aspiration.

Conclusion: ABMC and DBM appeared to be a good candidate to replace iliac crest autografting with a reasonable success rate and no morbidity of the donor site.

09.35 Endoscopic guided Tibiotalocalcaneal arthrodesis after failed osteosynthesis of pilon fractures

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Background: Pilon fractures are difficult to treat because of the fracture pattern and are usually associated with significant soft tissue injury. Patients with systemic disorders causing sensory neuropathy are at even greater risk of fixation failure, skin flap necrosis and deep infection.

Objective To present two cases treated with an endoscopic guided tibiocalcaneal arthrodesis after of failed pilon osteosynthesis compromised with infection in patients with a neuropathy.

Methods: Case 1 A 35-year-old male patient with Charcot-Marie-Tooth disease sustained two failed pilon osteosynthesis with recurrent luxation of the talus. The second osteosynthesis showed a S Aureus infection. After a thorough debridement and antibiotic therapy an endoscopic guided tibiocalcaneal arthrodesis was performed. Case 2 A 68-year old woman with diabetic neuropathy sustained three failed osteosynthesis. The third one showed a S Epidermidis deep infection. After a thorough debridement and antibiotic therapy an endoscopic guided tibiocalcaneal arthrodesis was performed.

Study design Case study

Results: After 2 years of follow-up, the patients still have a good function with a plantigrade foot in orthopaedic shoes and no complaints. The AOFAS hindfoot score was 68 in case 1 and 61 in case 2 after two years of follow up 60. CT scan confirmed bony fusion after one year follow up in both cases.

Conclusion and clinical relevance: The use of an endoscopic guided tibiotalocalcaneal arthrodesis is a valid option after an infected failed pilon fracture osteosynthesis. The technique minimizes new soft tissue damage and favours wound healing wich is beneficial in patients with systemic disorders compromising soft tissue repair. Level of evidence: Level IV

09.45 Supra-malleolar osteotomy and retrograde tibial nail for lower extremity correction

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Objectives: The use of a retrograde tibial nail in combination with a supra-malleolar osteotomy is an effective and powerful technique to correct lower extremity deformity. We describe a surgical technique of correcting lower extremity deformities, subsequent to traumatic etiologies, using a posterior sub-muscular surgical approach and retrograde tibial nail fixation.

Material/Methods: The cases were performed at the University of Louisville Hospital in Louisville, Kentucky, USA. The total population consisted of five patients, who were selected by the author D.S. based upon both clinical and radiographic variables. All patients underwent supra-malleolar osteotomies with retrograde tibial nailing for correction of lower extremity deformity secondary to traumatic etiologies. Radiographic interpretation was performed by the principle investigator (C.S), which consisted of calculating the total angular deformity correction at the supra-malleolar osteotomy site as well as the hindfoot. Additionally, the percentage of osseous fusion achieved at the supra-malleolar fusion sites was calculated.