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Treatment of Kienböck's disease with neutral ulnar variance by distal capitate shortening and arthrodesis to the base of the third metacarpal bone

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We evaluated whether a surgical technique combining distal capitate shortening and arthrodesis to the base of the third metacarpal bone for the treatment of the early stages (stages II and IIIA) of Kienböck's disease with neutral ulnar variance resulted in pain relief, improvement in wrist motion, or changes in the radiographic evaluation. This retrospective study reviewed 22 patients with early stages of Kienböck's disease with neutral ulnar variance, treated by distal capitate shortening and arthrodesis to the base of the third metacarpal bone. Patients were divided into 2 groups by disease stage: stage II (n =12) and stage IIIA (n = 10). There were 8 women and 14 men, with an average age of 35.7 years. The following parameters were measured before and after surgery: Visual Analog Scale (VAS) for pain evaluation, grip strength, Range Of Motion (ROM), ulnar variance, carpal height index, lunate height index, and the scapholunate and scaphocapitate angles. The patients were evaluated in accordance with Modified Mayo Wrist Score (MMWS). The average follow-up period was 30.5 months (range, 26-36 months). The stage II group showed significant improvements in the mean VAS (58e5), ROM (57% to 73%), grip strength (54% to 75%), and MMWS (51e78). Patients in the stage IIIA group showed nonsignificant changes in mean VAS score (64e42.5), ROM (52.5% to 55.5%), grip strength (46.5% to 57.5%), and MMWS (36e50.5). Significant decreases in the carpal height index and scaphocapitate angle, and an increase in scapholunate angle in all stage IIIA patients were observed. Distal capitate shortening with capitometacarpal arthrodesis can alleviate pain and improve ROM and grip strength in patients with stage II Kienböck's disease, but not in those with stage IIIA. Moreover, it cannot prevent carpal collapse, especially in stage IIIA of the disease. We do not recommend this technique for treating stage IIIA patients.

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Hematopoietic autophagy deterioration links to osteoporosis

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Statement of the Problem: Disorders of hematopoiesis affect skeletal system. Osteoporosis is a major risk of complications in hematopoietic disease such as hematopoietic malignancy, anemia, b-thalassemia and hematopoietic stem cell transplantation. We examine the correlation between hematopoietic system and bone homeostasis.

Findings: In clinical, we found positive correlation between red blood cell count and femur neck Bone Mineral Density (BMD) in 4964 healthy samples. Then femur-derived bone marrow of 30 patients was obtained from young normal BMD (BMD>-1.0, age<40y) or aged osteoporosis (BMD<-2.5, age>60y) during total hip replacement surgery. Human hematopoietic stem progenitor cells (CD34+CD45+) LC3 protein was inhibited in aged osteoporosis patients associated with descending autophagy gene expression, with Atg7, Atg5, Atg12, LC3b, Lam2a, P62 involved. To verify the clinical observation, deletion of Atg7 gene in hematopoietic system mice (Atg7f/f; Vav-iCre) were established, which led to autophagy dysfunction specifically in hematopoietic system. Atg7 null in hematopoietic system caused decreased BMD, low bone formation rate and weak bone biomechanical strength properties. Scanning electron microscope as well as H&E and Masson staining depicted trabecular microstructure destruction. However, there was no size difference in skeleton Alcian blue and Alizarin red S staining. Immunofluorescence of cortical bone revealed abnormal osteocyte size and number in Atg7f/f; Vav-iCre mice, accompanied by osteocyte DNA damaged and increased ROS level. Bone homeostasis related gene expression, including SP7, RUNX2, BMP2, BMP6, CTSK, TRAP5, was inhibited in Atg7f/f; Vav-iCre mice. Integrative proteomics functional enrichment showed Atg7f/f; Vav-iCre mice bone tissue skeletal systme morphogenesis and development were down-regulated, with Extra Celluar Matrix (ECM) pathway by KEGG analysis, which confirmed by collagen1 immunohistochemistry staining.

Conclusion & Significance: These findings suggest that deterioration of autophagy in hematopoietic system undermines osteogenesis, which are apparently caused by aberrant alteration in the ECM pathway, extending new potential cause and potential therapy of osteoporosis.

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Short segment fixation of thoracolumbar fractures with pedicle fixation at the level of the fracture

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Thoracolumbar fractures are very frequent injuries, for both anatomical and biomechanical reasons. The most appropriate surgical treatment is still debatable. However, the main objectives are generally the restoration of segmental stability, correction of the deformity, decompression and protection of the neurological structures, and obtainment of rapid clinical–functional improvements. The purpose of this study was to evaluate the efficacy and safety of thoracolumbar fracture fixation performed with short segment posterior fixation and insertion of undersized screws inside the fractured vertebra. A prospective study was conducted among 80 patients that were treated after sustaining a thoracolumbar fracture from January 2010 to December 2017. The site of the fracture was dorsal in 35 cases, lumbar in 40 cases and multifocal in 5 cases.58 patients were male and 22 females, with a mean age at diagnosis of 49.8 years. 42 patients were treated surgically using the studied technique (10 dorsal fractures and 32 lumbar). 38 patients were treated conservatively. At the clinical and instrumental follow-up, during a post-op period from a minimum of 6 months to a maximum of 18 months, the consolidation of the fracture was successfully achieved in all cases. In no case was there any worsening of the neurological situation or instrumental failure. In the presence of vertebral fractures of the thoracolumbar tract without neurological damage, the posterior surgical treatment with short segment construct and insertion of undersized screw inside the fractured vertebra without arthrodesis (fusion), permits consolidation of the fracture and allows a rapid functional recovery, with minimal incidence of complications.

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The "over the top" anterior cruciate ligament reconstruction in patients with open physes: A long term follow up study

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ACL rupture in skeletally immature athletes is becoming an injury with increasing incidence. Choices of treatments are still debated, including conservative management vs various surgical techniques. Lack of long-term reports has been highlighted in the literature. Aim: to evaluate long-term results of Anterior Cruciate Ligament (ACL) reconstructions in skeletally immature patients by using the "over the top" technique. Retrospective study. All surgeries performed by same team. 42 patients met inclusion criteria. All patients had preoperative radiological studies. 30 males-12 females. Average age: 12.5 years (range 11-14 years). Average follow-up: 96.1 months. Clinical evaluation: IKDC, Tegner-Lysholm, KT-1000, plain radiographs. Standardized rehabilitation protocol. No instability nor leg length discrepancy recorded. Muscle hypotrophy of operated limb: 20 cases. No revision surgery. Average pre-op Tegner-Lysholm and IKDC: 55 and 40; 94.8 ($p<0.05$) and 94.78 at final follow-up ($p<0.05$). Median post-op Tegner: 8. Mean side-to-side (KT-1000): 1,2mm.22 patients could go back to pre-injury sport activity. Average rehabilitation: 7.3 months. Few complications: 2 patients re-injured the operated knee (revision surgery needed); one contralateral ACL rupture, 1 soft tissue infection. No metalwork failure. A significant amount of cases (comparing our study to majority of published works) was included. Functional scores were overall satisfactory. No significance differences between operated limb and unaffected leg at final follow-up. All knees clinically stable. Our study boasts of well-structured and standardized long-term follow-up. The best possible methodology with clear inclusion-exclusion criteria and prospective data collection were used. Good results are testified by final achievement of 22 patients to go back to pre-injury sport activity in keeping with literature. The studied procedure seems an excellent option strategy and a feasible and safe technique when treating ruptured ACLs in scheletally immature patients. This is testified by good objective and subjective outcomes (medium and long-term).

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Classification algorithms for predicting the risk of osteoporotic fracture

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The information technology may provide alternative approaches to osteoporosis disease diagnosis. This systematic review was performed to compare the diagnostic accuracy of vertebral fracture assessment. In this study, we examine the potential use of classification techniques on a massive volume of healthcare data, particularly in prediction of patients that may have osteoporosis through its risk factors. For this purpose, we propose to develop a new solution approach based on Random Forest decision tree to identify the osteoporosis cases. There has been no research in using the afore-mentioned algorithm for osteoporosis patients' prediction. The reduction of the attributes consists to enumerate dynamically the optimal subsets of the reduced attributes of high interest by reducing the degree of complexity. A computer-aided system is developed for this purpose. The performance of the proposed model in this study is analyzed and evaluated based on set of benchmark techniques applied in this classification problem.

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Osteoporosis in male patients: Epidemiology, clinical aspects and DEXA Scan assessment

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Osteoporosis in male patients affects a significant number of the overall population and is the cause of a relevant percentage of fragility fractures. Our aim: to describe the epidemiology, clinical aspects and DEXA Scan assessment and results of osteoporosis in male patients at one single specialist center. Retrospective study. All DEXA Scans performed at one single specialist center within one year were selected. We sub-selected scans belonging to male patients older than 18 years. The T-score was utilised for patients older than 50, and the Z-score for patients with an age between 18 and 50. Among the overall 4369 performed scans, 376 (8.6%) matched the including criteria. Among those, 129 (of which 78% aged older than 50) had abnormal scan results. Mean age: 60 ± 13. BMI: 25,5 ± 2,8 kg /m2. 61 patients diagnosed with osteoporosis according to scan results and the rest sustained an osteoporotic fracture. Densitometric osteoporosis: 49% spine, 33% hip, 18% spine and hip. 30 of the 61 patients had history of osteoporotic fracture of the spine, hip, wrist or other sites. 21% of these 30 patients was older than 50. Causes of osteoporosis: 24% idiopathic, 18% related to steroids, 19% related to lack of vitamin D, 16% related to chronic renal insufficiency. Osteoporosis in males must be considered a serious disease. 1 in 6 of the included patients had diagnosis of osteoporosis. This was commonly associated to other comorbidities. Half of these cases had severe osteoporosis. More frequently osteoporosis is associated to secondary causes, which could be early diagnosed and used to plan prevention/treatment strategies. Diagnosis of osteoporosis is usually delayed. Therefore, we would like to highlight the importance of osteoporosis in males and advocate better consciousness within the medical community in order to improve early diagnosis, prevention and treatments, especially among high risk patients.

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Predictors of in-hospital ambulatory status following low energy hip fracture surgery

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Background: 25-75% of independent patients do not walk independently after Hip Fracture (HF), and many patients experience functional loss. Early rehabilitation of functional status is associated with better long-term outcomes, however predictors of early ambulation after HF have not been well described.

Purposes: To assess the impact of perioperative and patient specific variables on in-hospital ambulatory status following low energy HF surgery.

Patients and Methods: This is a retrospective analysis of 463 geriatric patients that required HF surgery at a metropolitan Level 1 Trauma Centre. The outcomes were time to transfer (out of bed to chair) and time to walk.

Results: 392 (84.7 %) patients were able to transfer after surgery with a median time of 43.8 hours (quartile range 24.7- 53.69 hours) while 244 (52.7%) patients were able to walk with a median time of 50.86 hours (quartile range 40.72-74.56 hours). Pre-injury ambulators with aids (HR, 0.70, CI, 0.50-0.99), age >80 years (HR, 0.66, CI, 0.52-0.84), peptic ulcer disease (HR=0.57,CI, 0.57-0.82), depression (HR, 0.66, CI, 0.49-0.89), time to surgery >24 hours (HR= 0.77, CI, 0.61-0.98) and surgery on Friday (HR= 0.73, CI, 0.56-0.95) were associated with delayed time to transfer. Delayed time to walk was observed in patients over 80 years old (HR= 0.74, CI, 0.56-0.98), females (HR=0.67, CI, 0.48-0.94), peptic ulcer disease (HR=0.23, CI, 0.84-0.66) and depression (HR= 0.51, CI, 0.33-0.77).

Conclusions: Operative predictors of delayed time to transfer were surgery on Friday, and time to surgery >24 hours after admission. Depression is associated with delayed time to transfer and time to walk. This data suggests that is important to perform surgeries within 24 hours of admission, identify deficiencies in care during the weekends, and create rehabilitation programs specific for patient with depression. Improving functional rehabilitation after surgery may facilitate faster patient discharge, decrease inpatient care costs, and better long-term functional outcomes.

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Vertebral fractures among patients referred for bone densitometry screening in Dubai Primary Healthcare Facilities

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Vertebral fractures are one of the most common fractures associated with low bone mineral density. However, two third to three fourth of patients with vertebral fractures are not clinically recognized. The objective of this study was to determine the prevalence of vertebral fractures in patients referred for bone densitometry and the most common site of fracture. The study was carried out in the osteoporosis clinic in Dubai Primary healthcare center. A total of 120 patients were examined using the dual energy x-ray absorptiometry. Of all the patients, 48.3% were osteoporotic and 40.9% were osteopoenic. The overall prevalence of vertebral fracture was 14.2%. The result showed that the prevalence of vertebral fracture was higher in female compared to male (15.7% and 9.7% respectively). It was found that patients aged 80 and above had the highest prevalence of vertebral fracture (54.5%). Undiagnosed vertebral fractures were common. Therefore, it is crucial to prevent vertebral fracture through early diagnosis and appropriate treatment of osteoporosis.

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Alcohol and other factors affecting osteoporosis risk in women

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By about age 35, people reach their peak bone mass. Women lose bone mass slowly after that point until a few years after menopause, when bone mass is lost very rapidly. For middle-aged and older women, healthy bones depend on the development, during younger years, of a strong bone structure and an adequate peak bone mass. There is tenuous evidence that moderate alcohol consumption may protect bone. But human and animal studies clearly indicate that chronic heavy drinking, particularly during adolescence and the young adult years, can dramatically compromise bone quality and may increase osteoporosis risk. Further, research indicates that the effects of heavy alcohol use on bone cannot be reversed, even if alcohol consumption is terminated. Research suggests that in addition to alcohol, other lifestyle factors—such as tobacco use, nutrition, weight-bearing exercise, increased body weight, and hormone replacement therapy—affect bone development and osteoporosis risk in women. However, there has been little examination of how alcohol interacts with these factors to influence bone health.

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