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Discussion With the expansion of recognition and surgical treatment of FAI it is reasonable expect an increase in the number of surgical revision. A correct selection of the patient, as pre-operative planning are determining factors in the outcome of treatment. Likewise, the planning of revision surgery must be comprehensive, and aims to correct all the factors previously disregarded.

Conclusions Revision surgery of FAI is indicated in surgical failures due to error of indication, planning and surgical technique, as well as in case of standard complications related to the disease.

Heterotopic ossification following hip arthroplasty: a comparative study about its development with the use of three different kinds of implants

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Introduction Heterotopic ossification is the presence of bone in soft tissues where it physiologically doesn't exist. It is one of the most common complications following hip joint replacement surgery with negative influence on the patients' quality of life. A variety of risk factors have been identified to date but etiopathogenesis is still uncertain. So far, the therapy which has shown efficacy is the preventive one, with NSAIDS and radiotherapy. Once ossifications have developed, surgical resection is needed. The aim of this study is to record the incidence of heterotopic ossification by different risk factors, verifying literature agreement. The final purpose is to identify high-risk groups of patients and possible preventive actions to decrease the incidence of heterotopic ossifications.

Methods We studied 651 patients undergoing hip joint replacement considering three kinds of implants (total hip arthroplasty ceramic–ceramic, TriboFit, endoprosthesis). Each patient has been analysed for ectopic ossification development by: age, gender, comorbidity, diagnosis, presence of previous ossifications, surgical approach, surgeon, kind of implant. Within the population which developed heterotopic ossifications, data were assessed for correlation with severity of ossification graded following Brooker's classification.

Results The overall incidence of heterotopic ossification was 59.91 %. The factors increasing the incidence at the univariable analysis were: male gender, young age, diagnosis of coxarthrosis compared to femur neck fracture, presence of previous heterotopic ossifications, lateral approach as opposed to anterior-lateral one, arthroprosthesis ceramic–ceramic and TriboFit compared to endoprosthesis. Heterotopic ossification has been strongly influenced by the surgeon. During multivariable analysis, the presence of previous ossifications and the kind of implant showed to be independent risk factors for the development of heterotopic ossifications. Analyzing the population which developed heterotopic ossification, we found that the severity of ossification by Brooker was influenced by: gender, surgeon, kind of implant.

Discussion In agreement with literature, the following risk factors have been confirmed: previous heterotopic ossifications, kind of implant, surgical approach, diagnosis of coxarthrosis compared to femur neck fracture, surgeon, male gender. In particular, Hardinge-Bauer and Watson-Jones surgical approaches and total hip

replacement ceramic–ceramic and TriboFit implants increase significantly the development of heterotopic ossifications.

Conclusions Our data show that the orthopaedic surgeon should prefer minimal-invasive surgical approaches and implants. Comparing our experience to literature, it's clear the need to introduce a preventive treatment and we suggest to perform a controlled randomized study as a valid aid to choose the most adequate therapeutic option for each patients' category.

BASIC RESEARCH

Preliminary results of the study of reduced gravity osteoporomalacia on human

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Introduction The osteoporomalacia by loss of gravity is the most important obstacle to the permanence of man in space. The astronauts are affected by a loss of bone mass comparable with systemic osteoporosis in post-menopausal women. This loss of bone mass was measured quantitatively and qualitatively before and after the flight, but during the missions were never studied the variations of the main metabolites of bone due to the difficulty of data collection. Another environment characterized by reduction of the gravity is underwater environment and may represent a more accessible model for the study of bone metabolism in reduction of gravity.

Methods We studied six athletes divers, three males and three females, mean age 32 years (26–40) who are immersed for 14 consecutive days at a depth of between 8 and 10 m, pressure from 1.6 to 2 atmospheres, temperature 24–26 °C. Blood samples were taken at time 0 (30 days before the dive), the 1st, 4th and 9th day of immersion, and finally on the 15th and 24th day after returning to the surface.

Results In this period of observation, the blood levels of parathyroid hormone (PTH) and alkaline phosphatase (AP), while remaining within the physiological range, decreased during the dive, returning to baseline values after emergence. In contrast, vitamin D has increased during the dive and then return to baseline values after surfacing, constituting, as compared to PTH and AP, a inverse profile.

Discussion Only the study NEEMO V conducted by NASA has analyzed some bone markers, noting, however, diametrically opposite behaviours with respect to the blood concentration of vitamin D, while agreeing on the decrease in the concentration of parathyroid hormone. Both in NEEMO V as in our study there is a correlation between the parameters that describe the stress and variation of the data of the PTH and vitamin D, while being different duration and mode of immersion in the two studied groups.

Conclusions In the absence of gravity in underwater environment is possible to detect changes in PTH and AP correlated with stress. Although these values only preliminary, drawn from a study initially designed for cardiac and metabolic markers, it appears interesting variation of bone metabolites. These data represent a reference platform for the next study of the osteoporomalacia in divers, planned on a more prolonged immersion, where the qualitative analysis of bone metabolism, also will be joined with the quantitative evaluation.