International Journal of Surgery Open 1 (2015) 30–34

Contents lists available at ScienceDirect

International Journal of Surgery Open

journal homepage: www.elsevier.com/locate/ijso

Case Report

A case of the management of Heterotopic ossification as the result of acetabular fracture in a patient with traumatic brain injury

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ARTICLE INFO

Article history:
Received 9 March 2016
Accepted 10 March 2016
Available online 17 March 2016

Keywords:
Brookers III
Heterotopic ossification
Acetabular fracture
Indomethacin
Surgery
Shock waves

ABSTRACT

Introduction: The most common location of the heterotopic ossification is represented by the pelvic ring, followed by the elbow, shoulder, and knee. In the case of severe brain or spinal traumas resulting from a coma state, calcifications developed within three months from the trauma, and occurred more frequently in people between twenty and thirty years of age.

Presentation of case: We present a case report of a 29-year-old patient with heterotopic ossification of the left side hip soft tissue, as a result of traumatic brain injury (coma for ten days). The patient suffered by fracture of the iliac wing, acetabulum and left ischio pubic ramus, which were surgically treated. The patient came to our observation for hip stiffness six months prior to the study. XR performed in standard projections, wing and obturator, showed the formation of a grade 3 heterotopic ossification of Brooker's classification. From the post-surgery to sixth month after the demission, the patient was surgically treated by an anterolateral hip approach to remove calcifications. The patient was subjected to anti-inflammatory therapy and indomethacin, shock waves, and physiotherapy to improve the mobilization of the hip. He had good results.

Discussion and conclusion: Heterotopic ossification represents a disease which is not very common, but has particular characteristics with debilitating consequences. The disease is responsible for reduction of functionality of the affected joint. There are many different treatments available, but it is necessary to choose the most appropriate one, considering: responsible cause, location, Brooker's classification, the articular functionality.

1. Introduction

The most common location of the heterotopic ossification is represented by the pelvic ring, followed by the elbow, shoulder, and knee. The sopratrocanteric area of the pelvis is the most severely affected, with possible formation of bony bridges in more severe forms. Joint stiffness represents the pathogenetic characteristic of this often disabling disease, which can result from peri-articular fractures often associated with traumatic brain injury, repetitive microtraumas, fracture-dislocations, bruises, or prosthetic surgery. This condition can also derive from nontraumatic causes, such as diseases of a rheumatic syndrome, deposited crystals of calcium pyrophosphate, neurological diseases, and prolonged mechanical ventilation [1].

In the case of severe brain or spinal traumas resulting from a coma state, calcifications developed after two or three months, and occurred more frequently in people between twenty and thirty years of age [2].

Further causal factors that may influence the formation and precipitation of crystals are the type of trauma and individual predisposition [3]. According to some literature studies, the etiopathogenesis of the condition could be linked to an alteration of the gene ANKH on the chromosomal region 5p15, which encodes a transmembrane protein that transports the inorganic calcium pyrophosphate (Ppi) [1,2].

The direct consequence is an increase of extracellular Ppi and its deposition ectopic sites [1,2].

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http://dx.doi.org/10.1016/j.ijso.2016.03.001

Posttraumatic calcifications represent a problem that has greatly stimulated the study of the peculiar biomechanical features of this condition, in order to prevent its consequences and implement specific therapies where possible [4]. We reported a case of heterotopic ossification as the result of an acetabular fracture in a 29-year-old male with traumatic brain injury. At the moment of trauma, he did the perioperative prophylaxis with NSAIDs for heterotopic ossification.

2. Presentation of the case

A 29-year-old male treated two years ago for a fracture of the pelvis by fixation with plates and screws by ilioinguinal extended access. The patient came to our observation for hip stiffness six months prior to the study. XR performed in standard projections (Fig. 1a,b), wing and obturator, showed the formation of a grade 3 heterotopic ossification of Brooker's classification (Fig. 1c).

Orthopedic objective exam showed extreme functional limitation of the left hip (active mobility: flexion of the hip bending the knee extended 40°, flexion with the knee flexed60°, extension of the hip with the knee extended 20°, extension of the hip with knee flexed 5°, abduction15°, internal rotation15°, external rotation25°, 0°adduction) and severe difficulty in walking (Fig. 2).

The patient also felt pain when acupressure was exerted on the sopratrocanteric site.

Blood tests were performed for the patient to determine any subjective predispositions (calcium concentration in plasma, serum and urine phosphate, PTH and vitamin D). The blood parameters were included in the benchmarks.

The patient was subjected to Harris Hip Score [5] and the general health SF-36 [6].

The patient was surgically treated by an anterolateral hip approach to remove calcifications, which intraoperatively (Fig. 3) resulted in a good recovery of the ROM (passive mobilization: flexion of the hip, bending the knee extended 90°, flexion with the knee flexed 100°, extension of the hip with the knee extended 85°, abduction 35°, internal rotation 30°, external rotation 50°), which was also confirmed by postoperative RX (Fig. 4) and clinical exam (Fig. 5).

For the next two months, the patient was subjected to anti-inflammatory therapy with a second dose of indomethacin (started within 24 hours post-surgery), shock waves, and physiotherapy to improve active and passive mobilization of the hip [7]. At six months follow-up, we noticed a significant improvement of mobility with significant reduction in stiffness (as evidenced by the clinical picture and the Harris Hip score: value of 51 preoperatively to 87 postoperatively). The patient walked without a limp and with considerable satisfaction, which is shown by the rating scale SF-36 (Fig. 6) subjected to the same before and after the treatment.

The recovery of hip mobility and functionality appears complete (active mobility: flexion of the hip bending the knee extended

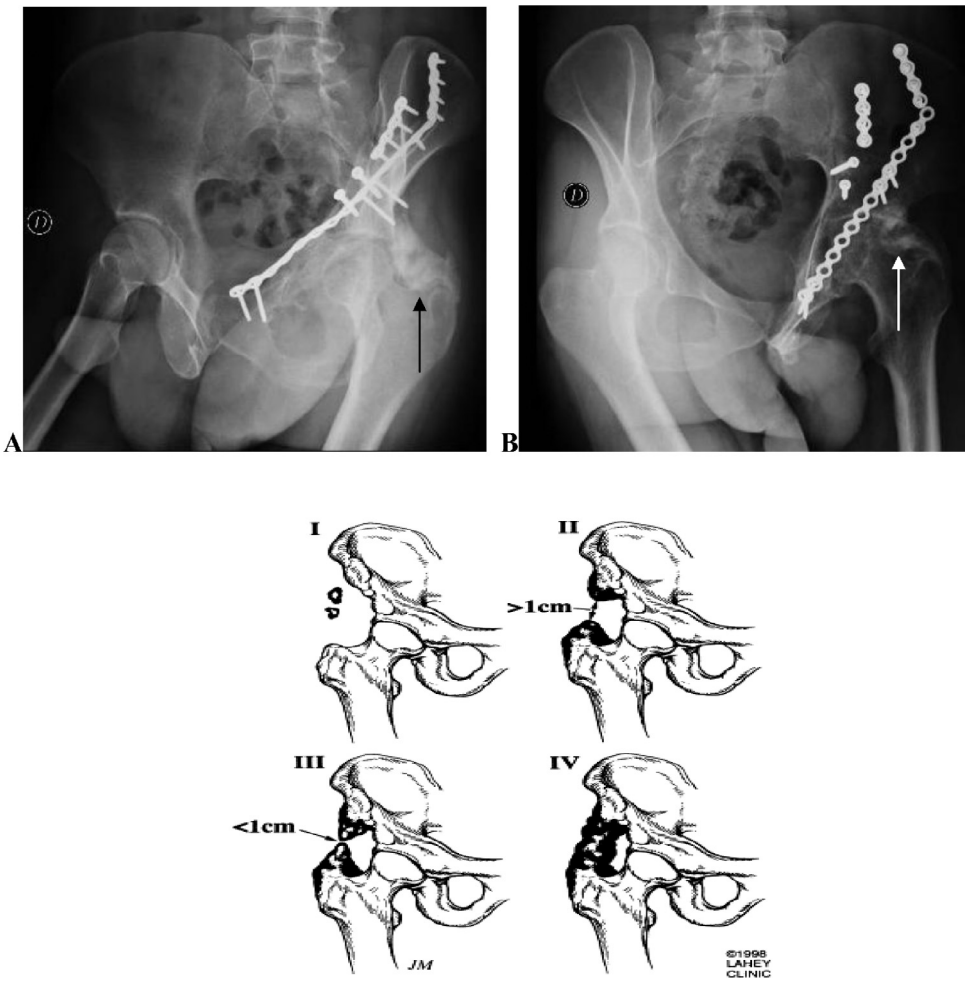

Fig. 1. The preoperative XRs in the two projections (A, B) show the heterotopic calcifications (arrow). (C) The Brooker classification (great trocanter's calcification) is divided in: Class 1: Islands of bone within the soft tissues surrounding the hip; Class 2: Bone spurs from the pelvis or proximal femur with about 1 cm between the two ends; Class 3: Bone spurs from the pelvis or proximal femur far less than 1 cm; Class 4: Ankylosis of the hip bone.