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CLINICAL CASE

BILATERAL ACETABULAR FRACTURE - TWO CASES REPORT

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ABSTRACT
Bilateral acetabular fractures are a challenge even for experienced orthopedic surgeons .We show the case of two patients who had an isolated acetabular bilateral fracture, following a severe trauma caused by a traffic accident, and who were treated in our department. The treatment strategy is planned by a team of surgeons. After adequate preoperative preparation and use of a surgical treatment by postero-lateral Moore and Kocher-Langenbeck approach with internal fixation, our clinical and radiological results were very satisfying.

KEY WORDS: Bilateral, Acetabular, Fracture, internal fixation.

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INTRODUCTION:
Acetabular fractures are part of the pelvic fractures. This type of injury is mostly encountered in trauma emergencies, as a result of a severe injury. Bilateral acetabular fractures occur in both left and right hip, and are a very rare type of acetabular fractures [1]. In the literature, bilateral acetabular fractures are found not only due to low energy trauma, especially after epileptic seizures, but also due to non-traumatic entity in patients who are potentially osteoporotic [2, 3].
We present two cases of bilateral acetabular fractures secondary to severe trauma following traffic accidents, without causing any damage to other parts of the pelvic girdle. The treatment strategy is planned by a team of experienced surgeons.

CASE REPORT:
Case 1: A 23 year old student was involved in a road-traffic accident after his motorcycle crashed into a car driven at high speed. The patient was thrown off the motorcycle and hit by the side of the road, which lead to multiple impacts: thoracic and pelvis, with loss of momentary consciousness. Moreover, he had a 7cm parietal scalp wound. The patient was hemodynamically unstable with an initial blood pressure of 80/50 mm Hg, associated with respiratory distress syndrome. He was initially admitted to the emergency room where he received two liters of Ringer lactate infusion and a blood transfusion. A massive haemothorax was drained in the emergency room using a chest drain with close haemodynamic monitoring.

After stabilizing the patient's hemodynamic state, a radiological assessment and a body scanning were performed, which showed an abundent hemothorax and a kidney lesion operated in the emergency room by a team of urologists. Nonetheless, the cerebral scanning showed nothing particular. X-rays of the pelvis (antero-posterior:A.P, obturator oblique, iliac oblique) showed bilateral acetabular fracture (Figure 1a-b-c), and the 3D scanning with reconstruction showed a fracture of the posterior wall and the anterior column of the left acetabulum, associated with the fracture of the posterior wall of the right acetabulum, according to the Letournel classification (Figure 2a-b).

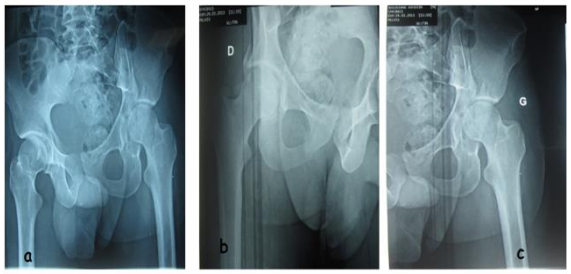

Figure 1: The X-ray of The pelvis (A.P(a), obturator oblique(b), iliac oblique(c)) showing acetabular bilateral fracture.

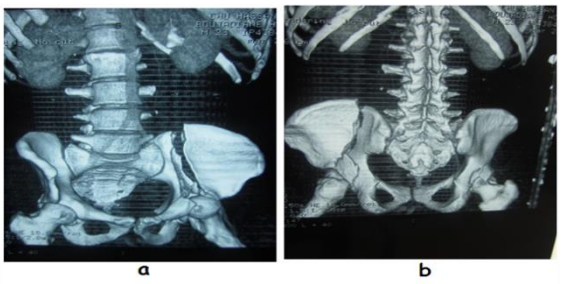

Figure 2: the scanner of the hip with 3D reconstruction.

The preparation for acetabular fracture surgery was done by bilateral transtibial skeletal traction using two Kirchner wires (20/10). Then, the patient was transferred to the intensive care unit for management of the polytrauma.
Surgical method: the surgery was performed on the 7th day of admission. The acetabular fracture was fixed by two special acetabular plates under general anesthesia. These fractures were surgically fixed by two special acetabular plates, by a Kocher-Langenbeck approach for the left acetabulum and postero-lateral Moore approach with trochanteric osteotomy for the right acetabulum (Figure 3a-b).

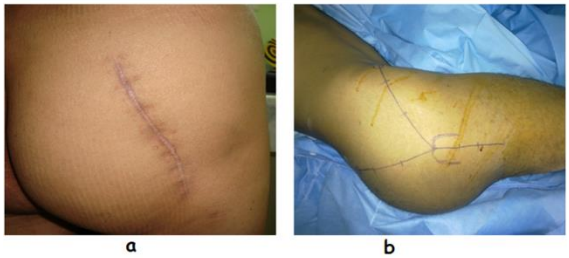

Figure 3: the surgical approach.
(a) : postero-lateral approach (Moore).
(b) The posterior Kocher-Langenbeck approach.

Concerning the prophylaxy of heterotopic ossifications, the patient received 75 mg of Indometacine per day for 6 weeks. Because of the bilateral fracture, the immobilization had a total duration of 10 weeks. After 16 weeks, the patient was allowed to walk using crutches. As a result, in 24 months, the patient was able to walk without any help, with a total consolidation of all the fractures without osteoarthritis of the hip (Figure 4).

Figure 4: postoperative radiography showing anatomical reduction, and fixation by 2 plates.

The patient was able to walk without any support and with no pain in the hip. The score of Harris was 97 on the right hip and 93 on the left hip. The patient returned to his job before trauma (Figure 5).

Figure 5: Satisfactory functional results, at follow-up of 24 months.

Case 2: A 42-year-old patient, without any noticeable medical history, was admitted to the emergency room for polytrauma, due to a traffic accident. There was a collision between two cars, the rear passenger was protected by a seat belt, but had multiple injuries: on the left upper limb and pelvic girdle. The clinical examination showed pallor of the patient and open fracture of the upper limb classified as III (Cauchoix and Duparc). After stabilizing the hemodynamic state of the patient, the radiological assessment was performed and showed a complex fracture of the radius and ulna associated with a bilateral acetabular fracture: a transverse fracture of the left acetabulum and a posterior wall fracture of the right acetabulum (Figure 6, 7).

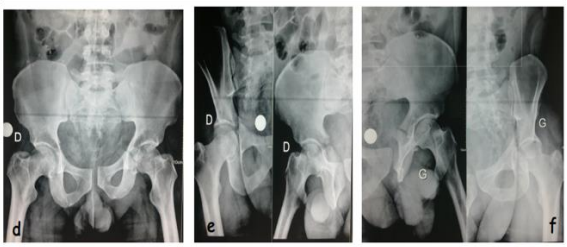

Figure 6: Pelvis radiographies (A.P(d), obturator oblique(e), iliac oblique(f)) showing acetabular bilateral fracture .

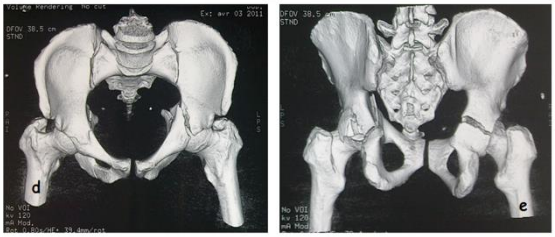

Figure 7: The scanner of the hip with 3D reconstruction.

Surgical method: the patient was admitted to the emergency room for an open fracture. A surgical debridement with a fixation of the fracture by osteosynthesis using the Kirchner wires was performed. However, the bilateral acetabular fracture was operated on the 10th day and the fixation was made using one special acetabular plate (6 holes) for the left hip, the right hip being fixed by 2 screws, using the same surgical postero-lateral Moore approach (Figures 3-8).

Figure 8 : postoperative radiography showing anatomical reduction and fixation with plates and 2 screws

The last clinical results at 19 months follow-up were very satisfying concerning both hips, with a score of Harris which was 96 on the right hip and 94 on the left hip. The open fracture of the upper limb was treated definitively by a rigid internal osteosynthesis (plate DCP) with bone reconstruction using an induced membrane and cancellous autograft.

DISCUSSION

The acetabular fractures are among the most complex lesions in orthopedy. Orthopedic surgeons are aware not only of the fact that it is difficult to manage this type of fractures, but also of the associated morbidity and mortality as well. However, this type of fracture is a rare entity. No similar cases or documents were previously reported in the French or English literature during our research for cases that present isolated bilateral acetabular fracture, fracture without any associated injuries of the pelvic belt, fracture due to severe trauma, and fracture treated surgically by internal fixation.

Our aim was to describe our treatment strategy and clinical results through these two observations. This is why we reported two cases of pelvic complex trauma due to multidirectional powers. In the literature, the common mechanism represents an axial load with a flexion of the hip [1]. This type of fracture belongs to none of the acetabular classifications or pelvic fractures. In our cases, we use the Letournel classification.

Open anatomic reduction and internal fixation, the same principle as in other intra-articular fractures, are now a standard treatment for displaced acetabular fractures. In a comparative study, Kebaish et al showed that the surgical treatment of the displaced fracture of the acetabulum had higher results compared to non-surgical treatment: 86 % of good results compared with 30 % good results [4]. The purpose of the acetabulum fracture treatment is to obtain an anatomical reduction of the internal joint surface by a stable fixation of the fracture, to allow an early mobilization of the hip joint, but the choice of the surgical approach remains controversial [5]. The combined use of the anterior and posterior approach proved to be the best option. This surgical approach was considered a surgical approach of best choice for complex acetabular fracture stabilization with less morbidity [6]. In our experience, using a Kocher-Langenbeck and postero-lateral (Moore) approach gave satisfying results.

The hemodynamic instability was explained by thoracic and abdominal trauma. The therapeutical management was performed in order to get a normal blood pressure. Our aim is to be careful and decrease the surgical stress, thus the stabilization of the acetabulum was postponed to the 7th, 10th day.

In the last follow-up, the difference between both operated hips was not significant, with a score of Harris slightly better on one side compared to the other side, concerning the severity of the initial injury, but in general our functional results were excellent. Many different factors influence the results, in particular; the age and the delay period of the surgical operation. A delay of 3 weeks was noted responsible for lower functional results [7,8]. Concerning the functional evaluation of the acetabular fracture, we used the score of Harris to evaluate the function of the hip, but the Merle d'Aubigne-postel score was usually used for the evaluation of the acetabular fractures [9]. Moed BR et al proved the inferiority of the scoring system of Merle d'Aubigné and Postel in the evaluation of the acetabular fractures [9], while Hirvensalo E et al reported that the score of Harris was classified as an effective tool to estimate the results of the acetabular fracture [10].

CONCLUSION

Bilateral acetabular fracture is a rare injury. Surgical treatment with internal fixation has significantly improved the prognosis of these injuries. Adequate evaluation and surgeon experience are essential to obtain excellent outcome.

LIST OF ABBREVIATIONS

A.P: anteroposterior
3D : Three-dimensional

PATIENT CONSENT

Written informed consent was obtained from the two patients for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

COMPETING INTERESTS

The authors declare no competing interests.

AUTHORS' CONTRIBUTIONS

Boussakri Hassan was the principal author and major contributor in writing the manuscript. Elibrahimi Abdelhalim and Elidrissi Mohammed collaborated in writing the manuscript, analyzed and interpreted the data from our patients and reviewed the literature. Shimi Mohammed and Elmrini Abdelmajid read and corrected the manuscript. All authors read and approved the final manuscript.

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