



Acetabular fracture during pregnancy. A report of two cases

Fracture du cotyle pendant la grossesse. À propos de 2 cas

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ABSTRACT

Acetabular fractures in pregnant women are rare but their management hardly altered by the presence of the foetus remains a daunting task for the orthopaedic surgeon. Two cases of left acetabular fractures occurred in advanced pregnancy are presented. The foetus was dead on arrival in one case and alive in the other patient. Open reduction and internal fixation of the acetabular fracture was carried out in both cases.

The necessity of an experienced multidisciplinary team is outlined. The option of a delayed reconstruction of the acetabulum is discussed.

RÉSUMÉ

Les fractures du cotyle pendant la grossesse sont rares. La présence du fœtus rend leur traitement difficile. Deux cas de fracture du cotyle gauche au cours de la grossesse sont rapportés. A l'admission, le fœtus était vivant dans un cas et décédé dans l'autre. Une ostéosynthèse à foyer ouvert était réalisée dans les deux cas. La nécessité d'une équipe expérimentée et multidisciplinaire est soulignée. L'option d'une reconstruction cotyloïdienne différée est discutée.



I. INTRODUCTION

Timely open reduction and internal fixation, as for any other intraarticular fracture, has become the standard treatment for a displaced acetabular fracture since the results after surgery correlate most closely with the quality of the reduction [1, 2]. The difficulties of the operative approach of these fractures as well as the general unwillingness to surgically treat gravid patient make the surgical treatment of acetabular fracture during pregnancy more challenging. This stems from a fear of inducing labour prematurely or causing death of the foetus by shock or operative manipulation [3]. In modern times, automobile accidents affect up to 7% of pregnancies making trauma in gravid patient a target of concern from medical and socioeconomic standpoints. This has sparked a flurry of studies toward the epidemiological data, the relevant principles necessary to allow a sound management of this group of patients, and the maternal and foetal outcomes [4-9]. But articles regarding the surgical management of acetabular fractures in gravid patients are limited to individual cases report [10, 11]. We present two cases of left acetabular fractures in advanced pregnancy. Open reduction and internal fixation of the acetabular fracture was carried out in both patients. The present article provides a recent addition with particular reference to the positioning of the patient, the surgical approach and the timing of operation.

II. CASE REPORTS

A- Case 1:

In May 1992 a 36-year old woman, 31 weeks pregnant (gravida 4, para 2) was hit by a car. At admission, the patient awake and oriented was complaining of her left hip. Her haemodynamic condition was stable. Ultrasound evaluation of the abdomen was normal. Foetal ultrasound and external heart rate monitoring showed a normal foetus with no placental abruption. Radiographs revealed a T shape acetabular fracture with a protrusion of the femoral head. The foetus was in cephalic presentation (Fig. 1a).

We have used subcutaneous low molecular weight heparin for thromboembolic prophylaxis. The patient was cleared for surgery and after discussion with the anaesthetic and obstetrical teams the fracture was operated on the next day under spinal anaesthesia and tocolysis. Intraoperative continuous foetal monitoring was not used.

Open reduction and internal fixation of the fracture were carried out through a Kocher-Langenbeck approach on a patient lying on the uninjured side (Fig. 1b). The rupture of membranes the night of the osteosynthesis has led to a caesarean section with a healthy baby successfully removed. The baby weighed 2100 grams, and had Apgar scores of 8 and 9 at 1 and 5 minutes, respectively. The baby had a normal neonatal course. The mother discharged ten days later was lost to late follow-up.

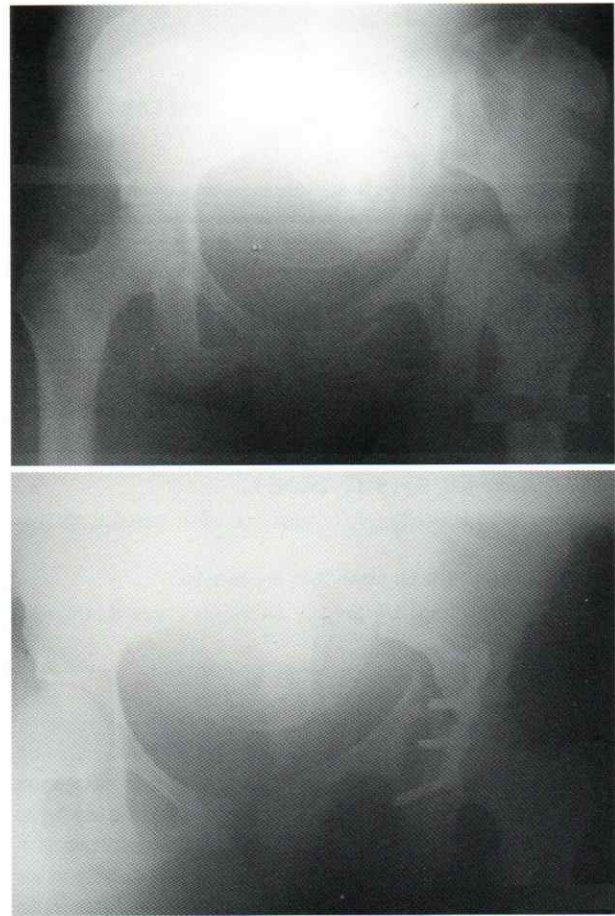


Fig. 1 : Patient 1: Radiographs showing a T shape fracture of the acetabulum with femoral head protrusion, foetus in cephalic presentation (a): X-ray before surgery (b): X-ray after surgery

B- Case 2:

In July 2003, a lady aged 21 years, 33 weeks pregnant (gravida 3, para 1) was admitted to hospital after a car accident. She was seated unbelted behind the driver. Suddenly, the car stopped after an engine failure. Her left knee would have struck the driver's seat. She was fully conscious and haemodynamically stable but was complaining of her left hip. The obstetrics team evaluated the foetus at the end of the ultrasound evaluation of the abdomen. There were no signs of foetal cardiac activity. Radiological examination revealed a left sided comminuted transverse and posterior wall acetabular fractures, with iliac dislocation of the femoral head. The foetus was in breech presentation (Fig. 2a). Subcutaneous low molecular weight heparin was given for thromboembolic prophylaxis.

Closed manipulations in emergency under general anaesthesia failed to achieve stable reduction of the joint dislocation. Forceps allowed the extraction of the dead foetus. The limb was immobilised on skeletal traction and internal fixation of the fractures was delayed for two days. Fractures were exposed through a Kocher-Langenbeck approach on a patient in a prone position. Reduction, fixation, and bone graft were performed (Fig. 2b). There were no complications postoperatively.

The mother was seen as an outpatient after three weeks when the sutures were removed. Bony union occur-

red by three months postoperatively. At this stage, the patient was walking normal, free of pain. Radiographs showed heterotopic ossifications.

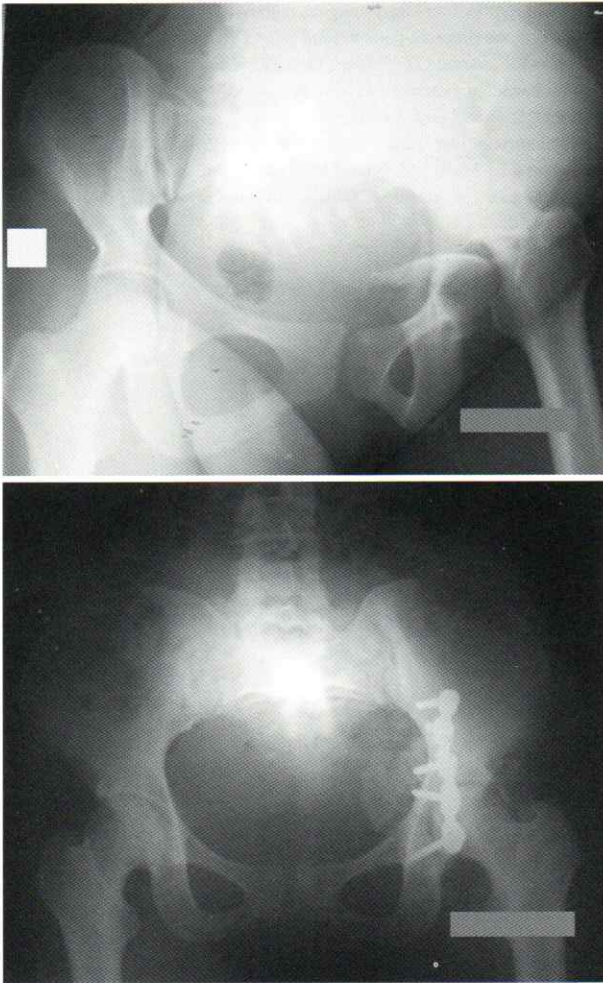


Fig. 2 : Patient 2 (a) Radiographs showing comminuted transverse and posterior wall acetabular fracture with an iliac dislocation of the femoral head, foetus in breech presentation (b) X-ray 3 months after surgery showing ossifications

III. DISCUSSION

We report these cases to point out the countless difficulties the surgeon will be faced with, when dealing with acetabular fractures during pregnancy. This study does not intend to report the long term outcomes for both the mothers and baby in case 1 since the follow-up of patients after discharge from the hospital is neither scrupulous nor scheduled at regular intervals so that long term results assessment in most studies performed in developing countries is difficult. In literature, previous case reports have documented acetabular fracture surgery during pregnancy before delivery with good outcome for both the mother and baby if their conditions are properly assessed by an experienced multidisciplinary approach including an obstetrician, perinatologist, orthopaedic surgeon, anaesthesiologist, radiologist, and nursing staff [12-14]. That acetabular or pelvic fractures during pregnancy are associated with foetal mortality was attested by the second case [15]. The imperfect reduction of the fracture and the premature rupture of membranes occurred after acetabular surgery in case 1 evidenced the fears harboured

that the actions necessary to adequately treat an acetabular fracture would directly or indirectly harm the foetus [16]. This understandable natural fear of jeopardizing the health of the foetus leads most surgeons to favour conservative treatment in gravid patient with acetabular or pelvic fractures [13]. The analysis of the literature by LEGGON et al concerning 101 acetabular or pelvic fractures revealed that the treatment of these fractures in this group of patients has been without surgery in the vast majority of cases [15]. Acetabular fractures during pregnancy are rare. Therefore experience about treatment strategies is still needed.

To date, the largest series of acetabular fractures treated surgically in gravid patients by a single surgeon was that by PORTER et al [16]. Out of 526 patients with acetabular fractures managed operatively between 2000 and 2006, 183 were female patients and 8 of these patients were pregnant at the time of presentation. There were no pregnant patients with a nonoperative acetabular fracture pattern evaluated during the inclusion period in their study. Fractures were operated on at presentation under general anaesthesia without intraoperative monitoring for all the foetuses whose gestational age ranged from 5 to 26 weeks. No complication stemming from the operative procedure was encountered. Reduction of the fracture was anatomic in seven cases.

All foetuses reached at least 36 weeks of gestational maturity and infant were delivered vaginally in four cases and via caesarean section in the remaining four patients. They concluded that in pregnant patients with acetabular fractures, once the patient and her foetus have been appropriately and thoroughly assessed, an attentive orthopaedic approach will not significantly add to the foetal and maternal morbidity or mortality above that imposed by the inciting trauma event. In case 2 with a foetus dead on presentation, anatomic reduction was obtained after surgery; situation similar to that for a non pregnant patient. In patient in case 1 in whom the foetus was alive, we were faced with formidable challenge in terms of the quality of the reduction of the fracture and the positioning.

Given the foetal gestation of 31 weeks, delaying surgery of the fracture for approximately 2 weeks, with planned caesarean section at 33 weeks of gestational age could be an alternative in improving the anatomical results. This timing is reasonable. If delayed reconstruction of the acetabulum is to be contemplated it should be performed within 3 weeks of injury as the quality of reduction diminishes after this delay [12, 17]. Delaying fracture fixation approach was planned by Leggon et al in a woman who was 32 weeks pregnant but premature labour occurred with a precipitous vaginal delivery 7 days after admission [15]. Four days after delivery, the patient underwent open reduction and internal fixation of the acetabular fracture. The problem of positioning is one that will crop up during any discussion of surgery during pregnancy. We had performed a left acetabular fracture surgery with a patient lying on right side though this positioning is not recommended in a gravid patient [4, 13, 14]. We had discussed

this approach with our obstetrics consultants and the anaesthesiologist team. They could find no definite contraindication to it since at that point in gestation, the size of the uterus was great enough to enable operative procedure in prone position. Premature rupture of membrane was seen in this patient but it is difficult to say with certainty whether this complication is due to the positioning. In retrospect this was another reason of postponing the acetabular surgery until delivery by caesarean section. In most single patient reports dealing with acetabular fracture surgery during pregnancy the right hip was commonly involved [10-13] with patients operated on successfully while lying on the uninjured limb [10, 12, 13]. In the case reported by Pals et al the patient was placed in a left semilateral position for a fracture of the right acetabulum. The foetal heart tones lost when the patient was turned in lateral position were again audible as soon as the patient was rolled back into the supine position [11]. In the series by PORTER et al., four patients underwent acetabular surgery in pronation uneventfully for posterior column or transverse associated with posterior wall fractures [16]. We concur with FLIK et al. that flexibility is required in patient positioning because some degree of lateral decubitus is required in patients in the late second or third trimester of pregnancy [14]. Experience with our patients at a single trauma centre along with review of other reports lead us to concede that the surgical treatment of displaced acetabular fractures in gravid patient is technically demanding. This management is a complex issue in which many confounding variables such as the timing for surgery and the positioning must be evaluated on an individual basis and factored into the risk-benefit ratio [14, 16]. In patients who are over 26 weeks of pregnancy, delayed reconstruction of the acetabular fracture within 3 weeks of injury after a planned caesarean section is a valuable option that should in the right circumstances be offered to them [4, 15, 17].

IV. REFERENCES

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