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Reconstructive total hip arthroplasty in a female patient with posttraumatic acetabulum (case report)

O.K. Chegurov, I.N. Menshchikov, A.S. Zhdanov

FSBI Russian Ilizarov Scientific Center «Restorative Traumatology and Orthopaedics» of the RF Ministry of Health, Kurgan

We present a clinical case of total hip arthroplasty in a 32-year-old female patient with posttraumatic acetabulum. Radiographs on admission showed postoperative condition, dislocated head of the left femur, misshaped pelvic ring, deformity and nonunion of the acetabular roof. Shortening of the left lower limb was 5cm. Range of motion in the left hip joint was sharply limited. The first phase of treatment included correcting osteotomy at the nonunion site, bone reduction, anterior column stabilization with pre-curved plate fixed with 5 screws. Pelvic bones consolidated. Cementless total hip replacement was performed at the second stage. Finally, lower limb length was equalized with the range of motion improved in the hip joint.

Keywords: acetabulum, nonunion, plating, total hip arthroplasty

INTRODUCTION

Acetabular fractures account for 7 to 25 % of all pelvic injuries [1] and are the results of high-energy mechanisms in polytrauma patients [2, 3]. The overall incidence of road traffic accident related fractures of acetabulum has been steadily rising in the last decades [4]. Severe pelvic injury can result in significant disability and reduction in quality of life [5, 6]. Treatment of patients with traumatic injuries of acetabulum is a serious orthopaedic assignment. Severe injuries to the pelvis can be life threatening, and shock, extensive internal bleeding and internal organ damage may be involved [6, 7]. There has been continued controversy with regard to the timing of surgical intervention, reduction technique, type of osteosynthesis and surgical approach to be used [8, 10, 11]. Transosseous osteosynthesis, open plating techniques and their combination are employed [9], total hip replacement can be an option for delayed posttraumatic condition [12]. Adequately performed osteosynthesis cannot always provide a favourable result due to degenerative changes in the joint [13]. Nowadays total arthroplasty of the hip is a method of choice for repair of the cohort of patients. Nevertheless, bone defects, scars and changed anatomical relations can cause considerable difficulties at preoperative planning and intraoperatively.

We present a case of a 32-year-old female patient T. who sustained an acetabular fracture in a road traffic accident. The first stage of treatment included osteosynthesis of pelvic bones for reduction and consolidation followed by total arthroplasty of the hip successfully produced at the second stage.

Clinical instance. A 32-year-old female patient T. was admitted to trauma and orthopaedic department of FSBI Russian Ilizarov Scientific Center «Restorative Traumatology and Orthopaedics» (RISC “RTO”) and diagnosed with a delayed pelvic injury, acetabular nonunion, dislocation of the left femur and postoperative treatment. The patient presented with pains, limited range of motion in the left hip and disturbed supportability of the left lower limb.

RTA of 21.02.2014 resulted in multiple pelvic fractures, dislocated left femur, brain contusion and subarachnoid hemorrhage. The patient’s general condition was stabilized. She was further treated in the city of Magnitogorsk with repeated reduction attempts of pelvic and the left femoral head using open approach with plating and transosseous osteosynthesis with the Ilizarov apparatus.

The patient’s general condition was satisfactory on admission (17.09.2014). She presented with a limp, used crutches for walking and orthopaedic footwear to compensate limb length discrepancy. No signs of infected skin were observed at the sites of previous interventions. Relative shortening of the left lower limb measured 5 cm. Range of motion in the left hip was 0/0/90 degrees; with abduction/adduction of 10/0/30 degrees, external/internal rotation of 45/0/0 degrees. Full range of motion was recorded in the knee joints. Radiographs of pelvis (**Fig. 1**) with anteriorposterior, obturator oblique and iliac oblique projections showed the condition after surgical treatment, deformity of the

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left acetabulum plated, high standing femoral head on the left side, greater trochanter fixed with a screw, distorted pelvic ring and lower consolidated fracture of the pubic rami on the right.

The preoperative Harris hip score was 16. Further tactics of treatment was determined through surgical analysis. The first stage involved the modified Stoppa approach with suprapubic and iliac surgical windows used to expose acetabulum, anterior column and quadrilateral plate. Scarry tissues and diastasis in the anterior column filled with scars were visualized. Correcting osteotomy at the nonunion was produced, the fragments' end mobilized, the bone reduced, anterior column stabilized with bridge-like prebent plate fixed with 5 cortical screws, drainage placed and the wounds sutured. Postoperative period was uneventful (**Fig. 2**).

Postoperatively, the patient used crutches for ambulation and shoe lift to compensate for limb length discrepancy. No angioneurotic disorders were observed. She was an in-patient for 15 days to follow an outpatient course of treatment.

She was readmitted to the hospital one year later (25.08.2015). CT scans showed nonunited displaced fracture of pelvic bones next to the left acetabulum with iliac body being distally up to 3 cm, narrow and deformed acetabulum, posterior-superior dislocation of the left femur displaced to supra-acetabular region by 4 cm. Clinical examination, presentation, local status and CT scans of the patient suggested total replacement of the left hip. The Harris hip score was 25. Cementless total replacement of the left hip was produced at the Centre's hospital (**Fig. 3**).

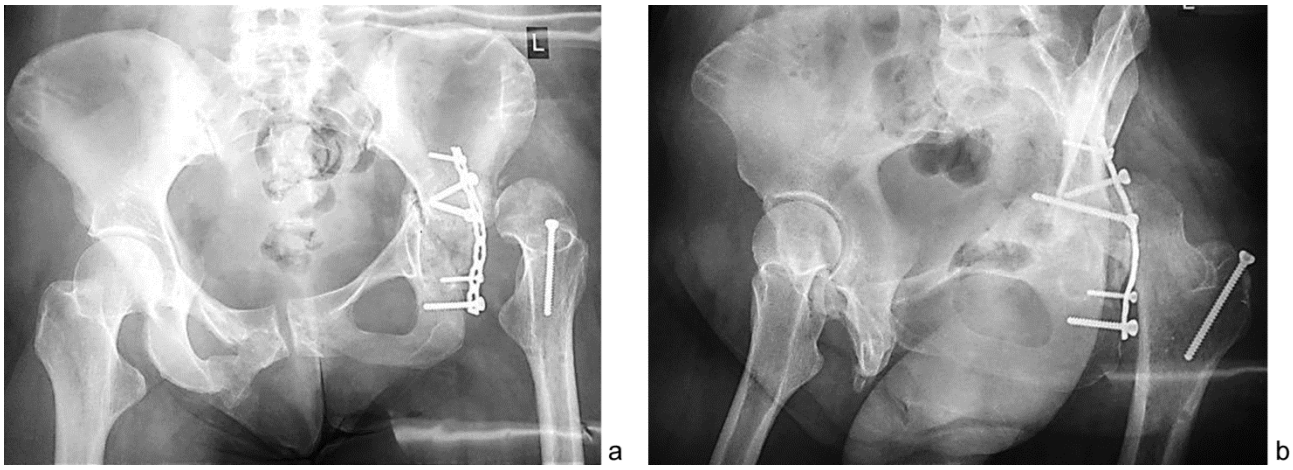

Fig. 1 Preoperative radiographs of pelvis and the hip joints of a 32-year-old female patient T. showing the condition after surgical treatment, deformity of the left acetabulum plated, high standing femoral head on the left side, greater trochanter fixed with a screw, distorted pelvic ring and lower consolidated fracture of the pubic rami on the right: a – anteroposterior view; b – lateral projection (X-rays taken at RISC "RTO" prior to the treatment)

Fig. 2 Radiograph of pelvis and the hip joints of the 32-year-old female patient T. showing bone fixation at the first stage of treatment

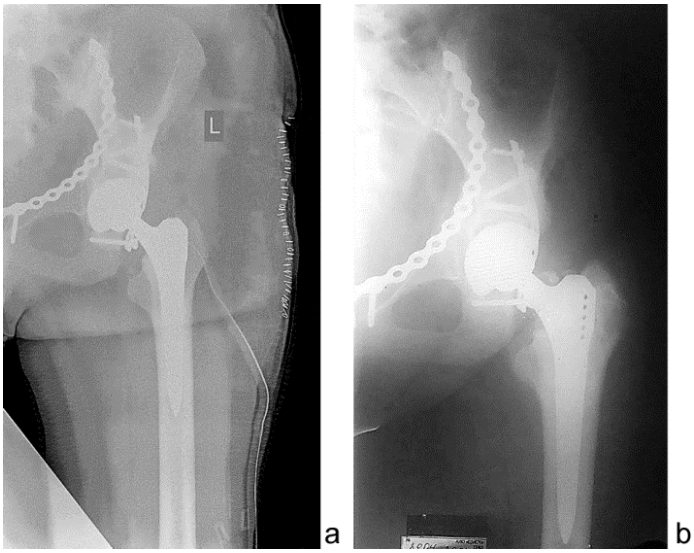

Fig. 3 Postoperative radiographs of pelvis of the 32-year-old female patient T. showing total hip replacement performed at the second stage of treatment: (a), early postoperative period; (b), 6 months after THR

Postoperative radiographs showed adequate implant position. It should be noted that severe scars and excessive bleeding caused technical difficulties during both procedures. On the whole postoperative period was uneventful. The axis and the length of the left lower limb were surgically restored. The in-patient could ambulate with crutches maintaining moderate weight-bearing on the left lower limb for 15 days and then received outpatient treatment.

The patient had no active complaints at 6-month follow-up. Her limb length was equal and she could walk without additional means of support and used a cane for longer distances. Range of motion in the hip joint showed functional values. The Harris hip score was 85. The patient was satisfied with the outcome.

CONCLUSION

The clinical instance supported the advantages of the two-stage orthopaedic treatment that included plating to achieve bone reduction and consolidation at the first phase and total hip replacement at the second phase. With stabilized general condition osteosynthesis could provide optimal environment for pelvic fixation and consolidation followed by stable hip implantation with minimal risk for acetabular component instability. The tactics of treatment resulted in a considerable rehabilitation effect measuring the total Harris hip score of 60.

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Information about the authors:

1. Oleg K. Chegurov, M.D., Ph.D., FSBI *RISC "RTO"* of the RF Ministry of Health, Kurgan, Head of the Laboratory of Reconstructive Arthroplasty and Arthroscopy
2. Il'ia N. Menshchikov, M.D., FSBI *RISC "RTO"* of the RF Ministry of Health, Kurgan
3. Aleksei S. Zhdanov, M.D., FSBI *RISC "RTO"* of the RF Ministry of Health, Kurgan, Head of Traumatology and Orthopaedics Department No. 2