CLINICAL CASE

THE SUBTROCHANTERIC FRACTURE IN ADULT MALES – ALTERNATIVE APPROACHES

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Abstract

The subtrochanteric fracture occurs on the femur bone at 5 to 7.5 cm below the lesser trochanter. Its uniqueness consists of the fact that it occurs at the junction between cortical bone and trabecular bone and also the various muscle attachments that displace the fractured ends making the end treatment difficult. We introduce a cases series of such situation. We treated our patients with intra-medullar nailing with or without cerclage cables and on all 3 presented cases one year follow up was excellent. We strive for the perfect implant, but for now we have yet to discover if cerclage cables on all intra-medullar nailing would be beneficial or the open method and the fracture hematoma evacuation is more of a disadvantage. The functional outcome of the patients was excellent using all three surgical methods. The most important aspect remains the recovery time and the patient's quality of life after the intervention. Therefore, the surgical strategy should be individualized for improving the outcome.

Keywords*: subtrochanteric fracture, intra-medullar nailing, osteoporosis*

Introduction

The subtrochanteric fracture is the type of fracture that occurs on the femur 5 - 7.5 cm below the lesser trochanter [1, 2]. It is more frequent in young patients who suffered a high energy trauma and older patients taking bisphosphonates treatment for osteoporosis [3-4]. Rarely, it has been described to appear as a consequence of a local tumor metastasis [6,7]. The particularity of this fracture consists of the fact that it occurs at the junction between cortical and trabecular bone and also in the variability of muscle attachments which displace the fractured ends making the treatment difficult [1,2]. Most authors are calling the subtrochanteric fracture the most difficult fracture to manage in a femur [8-10]. Nowadays the surgical approach is the gold standard. The main techniques for obtaining a good reduction, stabilization and good functional outcome include intramedullary nailing and various types of plate fixation [11]. Either technique has its own advantages and disadvantages [11]. Plate fixation is associated with a higher rate of delayed union or non-union and implant failure, respectively the intramedullary nailing has a more demanding technique and the use of fluoroscopy exposes the surgeon to higher doses of radiation [12,13]. Also, the closed reduction used in intramedullary nailing may not be enough to obtain a good reduction needing

additional cerclage cables for fixing the 10 degrees or more of malreduction which can occur in any plane leading to implant failure [14,15].

Case reports

This is a cases series aiming to introduce three cases of adult males diagnosed and treated for traumatic (of different intensities) subtrochanteric fractures. Intra-medullar nailing with or without cerclage cables were used to correct them.

Case report 1

A 59-year old male was admitted to emergency room after he suffered a fall from a ladder 2 meters above the ground. He presented with pain in the right hip area, functional impairment and with the lower limb in a vicious position (externally rotated, shortened and abducted). We performed routine X-rays (Figure 1) which established the diagnosis of comminute subtrochanteric fracture.

After the patient has been thoroughly evaluated for associated co-morbidities we preceded to fixing the fracture. The patient was positioned supine on a traction table and we performed closed reduction and fixation with a straight nail. Intra-operative X-rays revealed the unsatisfactory reduction, so we opted for better reduction with the aid of cerclage cables. At 3 months check-up the X-rays showed callus formation and the patient had little to no pain at right hip level (Figure 1).

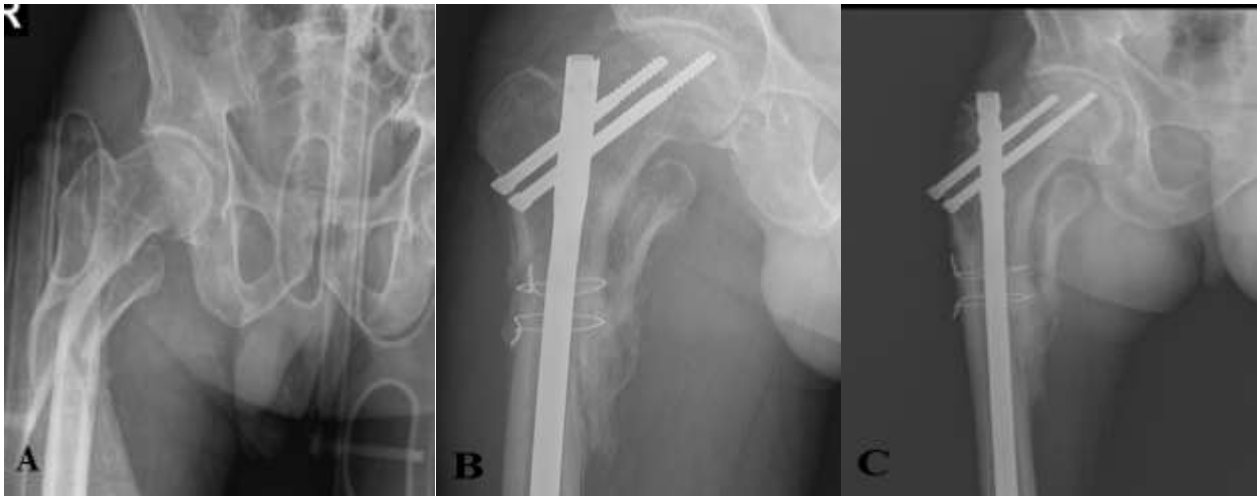

Figure 1 – (A)- Comminuted subtrochanteric fracture, AP view; (B)- 3 months postoperative radiograph showing osteosynthesis with straight nail and cerclage wires- AP view; (C) - 3 months postoperative radiograph showing osteosynthesis with straight nail and cerclage wires- oblique view

Case report 2

A 67 years old male who sustained a fall on ice from the same height. His clinical complaints were pain, functional impairment and vicious position of the left limb. After admission and assessment, we opted for the same supine position and traction table. The surgery went well and because we were able to obtain an excellent reduction there was no need to open the fracture site. As a result, both postoperative X-rays and 1-month follow-up were excellent (Figure 2). After 1 month the patient was walking full weight barring

Case report 3

A 62 years old male was hit by a car and was rushed to our emergency room. After interdisciplinary consults and evaluation (CT scan of the brain, X-rays of the chest and the right hip) a life-threatening diagnostic was ruled out and we were able to diagnose and further treat a subtrochanteric comminuted fracture on the right side. We began the surgery on supine positioning and with the help of the traction table. In this case we used a laterally curved nail (6 degrees) which has the entry point at the tip of the greater trochanter and not at the piriformis fossa like a straight nail. The reduction was satisfactory, and the patient

underwent early mobilization after surgery. One-month follow-up showed no displacement of the fracture comparative to the postoperative X-rays (Figure 3). The patient had a full recovery with no complaints and gain of all functions in the fractured limb.

Figure 2 – (A)- Simple subtrochanteric fracture, AP view; (B)- postoperative radiograph showing osteosynthesis with straight nail - AP view; (C) – 1 month's postoperative radiograph showing maintained reduction in osteosynthesis with straight nail – AP view

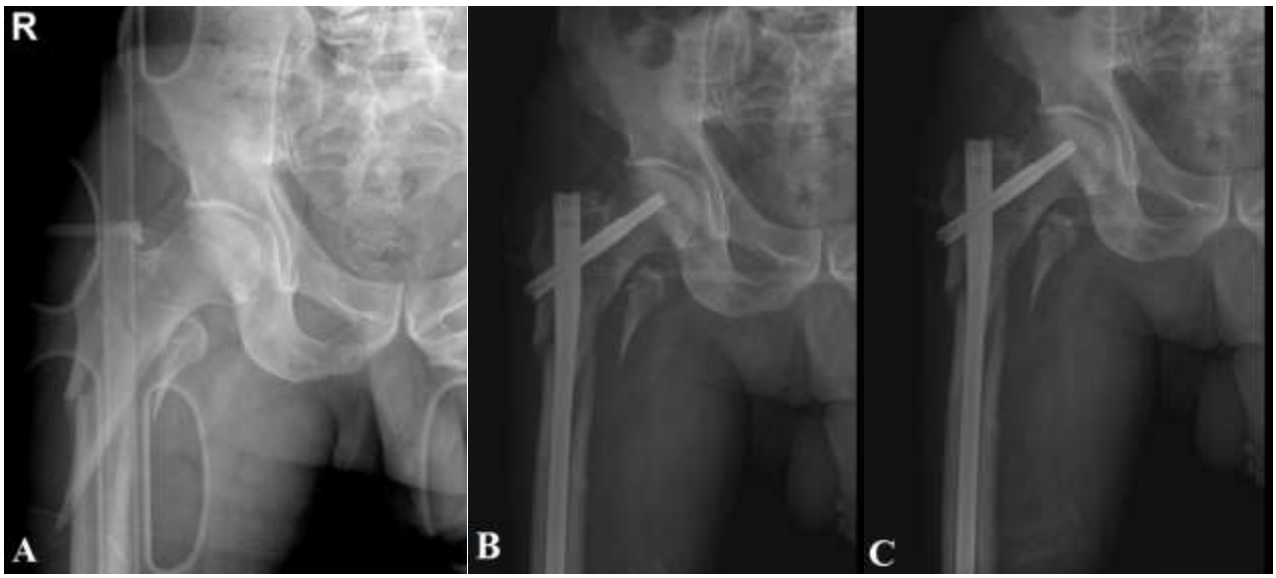

Figure. 3 – (A)- Simple subtrochanteric fracture, AP view; (B)- postoperative radiograph showing osteosynthesis with laterally curved nail - AP view; (C) – 1 month's postoperative radiograph showing maintained reduction in osteosynthesis with laterally curved – AP view

Discussions

The subtrochanteric fracture is still an issue regarding the management because of its anatomic peculiarities and there is yet to be found the perfect implant for treating it [16]. With the increase in age expectancy and the use of antiresorptive therapy, this type of fracture is pathology more frequent [16-18]. There are authors who advocate that the long-term results are the same with an external fixator as with centro-medullary osteosynthesis, but we have yet to prove this claim, mainly because our approach is to mobilize the patient as early as possible [16]. The use of plating is associated with the inability to restore early patient autonomy and also has a higher rate of implant failure [16]. For these reasons we prefer (as some other authors) nailing with occasional use of cerclage cables [16]. In all three cases we recorded excellent functional outcome and the

fact that we haven't encountered implant failure suggests that the approach was correct.

Conclusions

The functional outcome of the patients was excellent in all three cases. The most important aspect remains the recovery time and the patient's quality of life after the intervention. Therefore the surgical strategy should be individualized.

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