

C A S E R E P O R T

Intertrochanteric hip fracture in an arthrodesed hip treated by a LCP condylar plate

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Abstract. We report the case of an intertrochanteric hip fracture in a 73 years-old woman with a long-standing arthrodesis. The proper surgical treatment is controversial, but we decided to treat the fracture with a single LCP condylar plate turned upside-down. After one year the patient achieved her preinjury levels of activities. This kind of fracture could be satisfactorily treated with locking plate. (www.actabiomedica.it)

Key words: femoral fracture, hip arthrodesis, condylar plate.

Introduction

Coxofemoral arthrodesis is a surgical treatment used in the past in selected case of septic arthritis, hip arthritis or chronic painful hips in young adults or chronic painful hips especially in case of neurologic abnormalities in hip musculature. Because of the great success of total hip replacement, it has been performed in very few cases (1-2). However, in the past decades arthrodesis was frequently performed restoring back a good functional level with pain relief.

The position where to fix the arthrodesis and how to make it are very important and are correlated to patient satisfaction considering that the target is often among young patients and overload of the contiguous joints must be minimized.

The role of arthrodesis has decreased with the development and improvement of total hip arthroplasty.

In fact, it has gradually guaranteed a better hip function restoring a good quality of life and preventing most of complication with limited surgical exposure

Anyway, a well performed and stable arthrodesis has good results in the mid and long term follow up and reveals a high rate of patient satisfaction.

Nowadays old patients carrying hip arthrodesis can still be found.

Although incidence of fracture of the proximal femur are increasing in our society, fracture around an arthrodesed hip are rare events. Nevertheless, any orthopedic surgeon could face this event during his career and must be prepared to treat it properly. In literature there are only few cases regarding this kind of fracture, without a definitive treatment strategy.

Some authors report conversion of unfractured hip arthrodesis into total hip arthroplasty with good results.

No reports are available about conversion of fractured hip arthrodesis into total hip arthroplasty whereas all authors report treatment by osteosynthesis, without a definitive treatment strategy.

We present a case of intertrochanteric fracture treated with a single LCP condylar plate.

Case Report

In August 2018 a 73-year-old woman came to our emergency department complaining about pain and inability to walk after an attempt to flex her left hip. She underwent an arthrodesis of the left hip around 40 years before because of a severe dysplasia of the hip. Although the leg discrepancy and the limited ROM before the injury, she was able to walk long distances.

X-rays showed an intertrochanteric fracture of the arthrodesed hip (Fig.1) and CT scan was performed to better investigate the location and the morphology of the fracture (Fig. 2-5). Based on the imaging, we planned to treat this fracture with a 4,5 LCP condylar plate of the contralateral side turned upside down.



Figure 1. RX pre op in Emergency Room



Figure 2. CT pre op in Emergency Room



Figure 3. AP 6 months post op



Figure 4. LL 6 months post op



Figure 5. rx 18 months post op

The patient was operated supine on a fracture table with the leg in traction under spinal anaesthesia.

A standard lateral approach was used to access the fracture. We exposed the atrophied gluteus maximus and then the gluteus medius and the fasciae latae to access the fracture. During the surgery we found a medial bone gap due to the comminution of the fracture, so we also used a synthetic cancellous bone block as a biological scaffold. Under a C-arm intensifier the fracture was reduced and fixed with the 4,5 condylar right femur plate as planned. Screws were inserted in a bicortical manner

The surgical time was 120 minutes.

The patient was allowed to freely mobilize in the bed and began physiotherapy the day after the surgery. She was discharged home after the 10th postoperative day going on her physiotherapy as an outpatient service. Outpatient physiotherapy was done either in a rehabilitation clinic and at patient's home. For the first period no weight-bearing was allowed and therefore she faced only therapeutic exercise and transfer training.

Breathing exercise, isometric strengthening, pool therapy, straight leg raises and continuous passive motion of the knee with the machine was performed twice a day for 3 days a week for 6 weeks. After that a partial weight-bearing was granted but avoiding leg position greater than 60° of flexion to limit stress on the implant until fusion was obtained.

The total weight-bearing was increased after 2 months when we observed a radiological sign of consolidation.

Gait training and instruction in activities of daily life were now possible.

X rays and clinical follow-up were carried out at 1 – 2 – 6 (Fig. 6, 7, 8) and 18 months (Fig. 9).

At six months the fracture was completely healed, and the patient returned back to her preinjury level of function and autonomy.

Discussion

Hip's arthrodesis is a procedure used to treat damaged and painful hip in selected cases such as arthrosis after fracture, osteonecrosis, or joint sepsis. Nowadays since the spread of the total hip replacement it fell into disuse and it remains the treatment of choice in deteriorated, painful hip joints, especially in the case of contraindications and severe muscular deficits. Stover et al in a recent paper proposed the arthrodesis as a good option for adolescent or young adults (<40 years) with non-inflammatory monoarticular end stage hip arthritis in case of bone deficiencies or neurological and musculoskeletal deficit. In fact, young patients with these difficult problems may benefit from a THA in terms of early pain relief but may encounter multiple revisions during their lifetime. Therefore, hip arthrodesis still be a good option (3).

Fracture of arthrodesed hip is a rare condition and the surgeon is not usually guided by colleagues' experience in the choice of the treatment or of the type of implant to better reduce and fix the fracture.

We discussed a lot the various issues and which was the best treatment. Non operative treatment wasn't even considered in order to avoid long period of bedding and its complications. For us the biggest goals to achieve were the stability and the anatomical reduction. In fact, the rotational stress transmitted from the trunk to the lower limb made a rigid fixation necessary. Furthermore, the fracture line increases the shear stress, so it was mandatory to fix not only the fracture but also the previous arthrodesis to the pelvis.

However, it is important to fix the hip arthrodesis in a functional position. The optimal range is between 20-30° of flexion, 5-7° of abduction and 10° of external rotation. This position reports better results in patients' satisfaction because they feel the limb more stable. The orientation of the arthrodesis also involves the contiguous joints in the daily movements. Therefore, if not placed in the recommended range, the other joint will be overload, with symptomatic onset typically 20 years after surgery (2-3).

The segment usually affected are the lumbar spine and the ipsilateral knee, especially if placed in excessive abduction. Patient daily habits may decrease in activities that requires high level of flexion such as flighting by plane, sitting at the cinema or in tiny places for a long time, or riding a bicycle.

Shortening that often follows hip arthrodesis may cause lumbar pain and if more than 2 cm associated with with a perceptible limp, a gait described as asymmetric and arrhythmic (3, 4).

Fractures of the femur below the arthrodesis is a troublesome complication and can occur after minimal trauma.

After a Pub Med research, we found only few articles that describe a case of surgery in fracture of arthrodesed hip.

The first article described by Manzotti and Confalonieri reports a case of 74-year-old patient with intertrochanteric fracture in previously arthrodesed hip using double plating technique with titanium 4,5 reconstruction plate (5).

The same technique was used by Asakawa et al. to treat a 90-year-old. woman with a fracture involving the ilium, the original femoral head and the basicervical neck of an arthrodesed hip (6).

Other options of treatment include dynamic hip screw (6, 7), short intramedullary nail (8, 9), cannulated screw (10) or combination of them (11).

To our knowledge only one study reports treatment with locking plate. Delaneanu et al., in fact used a locked plate with 13 locking screws to fix an intertrochanteric fracture (12).

With rigid internal fixation, union rates of 85% to 95% commonly are reported (2).

In our case an LCP condylar plate was turned upside down to fit the contralateral proximal femur. This technique answered all the concerning that we had, allowing us to minimize the risk of displacement and non-union. It functioned as a bridging device by passing the comminute metaphyseal zone and ensuring at the same time good biomechanical stability and adequate biological push.

We did not use intramedullary nail because of the ankylosis that could have made harder positioning the implant in the right place; furthermore, this technique allows dynamic fixation.

On the other hand, performing a total hip arthroplasty was excluded too. It wouldn't have had any benefits due to the pelvic deformity, the ankylosis from a long stand arthrodesis and the huge gluteus muscles atrophy. By contrast, all these conditions would have enhanced the risk of dislocation and post-operative complications (10).

Conclusion

Proximal femur fracture in arthrodesed hip is a challenge owing to the lack of large number of cases, the little literature and therefore the consensus among surgeons.

However, in our case the patient had a quick recovery without complications, the fracture healed in proper time and mode. We can so consider condylar locking plate a valuable and satisficing option for the treatment of these fractures.

Conflict of Interest: The authors declare that they have no commercial associations that might pose a conflict of interest in connection with the submitted article

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