

Preliminary experience with MEDGAL DHS for treatment of proximal femoral fractures

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Summary. *Background and aim of the study:* The Authors report their implant's analysis and preliminary experience with a new fixation device, the MEDGAL DHS for treatment of proximal femoral fractures, produced by MEDGAL Sp.z o.o, Niewodnicka, Poland. *Materials:* Between January 2019 and September 2019 in Orthopedics and Traumatology Department of Piacenza, 12 patients with stable pertrochanteric fractures were treated with the MEDGAL DHS. *Results:* No patients presented perioperative complications with low bleeding and mean surgical time of 40 minutes. *Conclusions:* DHS is an optimal implant for the treatment of stable pertrochanteric femoral fractures. (www.actabiomedica.it)

Key words: pertrochanteric fractures, DHS, MEDGAL DHS

Introduction

Femoral fractures are one of the most common fractures encountered by orthopaedic surgeons across the globe (1). Intertrochanteric (IT) fractures are a common subtype of these and occur mostly in elderly patients with multiple co-morbidities, including osteoporosis (2), while in young adults, these fractures are generally due to high energy trauma, such as road accidents (3).

These type of fractures usually occur between the greater trochanter, the attachment site to the hip abductor and extensor muscles, and the lesser trochanter, the attachment site of the hip flexor muscle (4). The incidence of hip fractures is 2-3 times more common in females and the risk of fracture will double, every 10 years after the age of 50 (5).

The Dynamic Hip Screw (DHS) is a screw that allows for controlled dynamic sliding of the femoral head and is used to fix both the femoral head and the device to the shaft of the femur. The dynamic compression allows the weight-bearing stresses to stabilize the

femur so that it may undergo remodelling and proper fracture healing (6).

Materials and Method

Twelve patients (7 female and 5 male) with stable intertrochanteric fracture of the femur (AO Classification 31 A 1) have been treated with MEDGAL DHS between January 2019 and September 2019 at Orthopedics and Traumatology Department, Guglielmo da Saliceto Hospital, Piacenza, Italy.

The youngest patient was 70 years of age and the oldest was 83 years with the mean age being 76 years.

One patient had an outcome of progressive acetabular fractures ipsilateral of the pertrochanteric fracture.

The MEDGAL DHS is made of a titanium alloy ISO 5832-3 coated in silicon; silicon inducing bone attachment to metallic implants. In addition, these coatings are non-resorbable, and are thus suitable for long-term implantations.

These implant is available in a wide range of size and barrel angle (130°, 135°, 140°, 145°, 150°), for varied clinical situations.

The MEDGAL DHS have the possibility to have two different diameter of lag screw: 12.5 mm and 16 mm for the osteoporotic bone.

The surgical technique employed a lateral approach to the hip: the tensor fascia lata was incised and the vastus lateralis muscle was retracted, followed

by an L-shaped incision into the vastus lateralis muscle. Anatomical reduction was achieved. Guide wire insertion was done below the centre in the anteroposterior fluoroscopic image and central in the lateral fluoroscopic image. Reaming was done and appropriate size lag screw was inserted, side plate was fixed with insertion of the screws. Usually a five-hole long barrel plate (130°, 135°) was used in almost all our cases (Fig. 1-2).

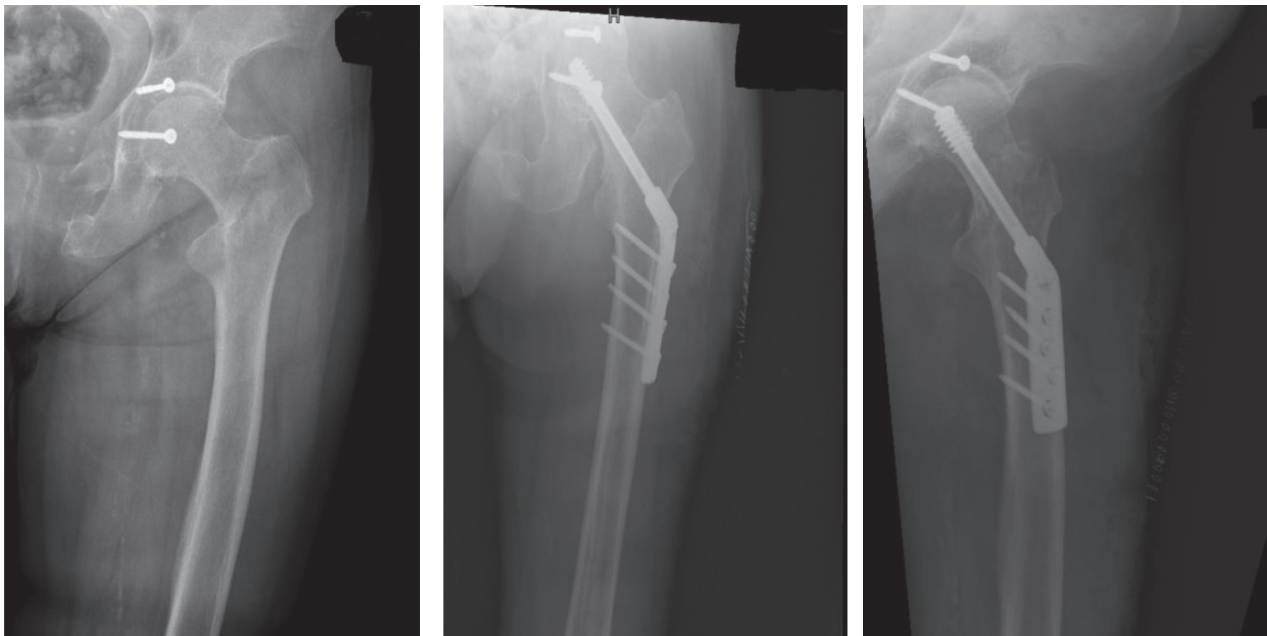


Figure 1. Pre and postoperative Rx images of the patients with a progressive acetabular fractures

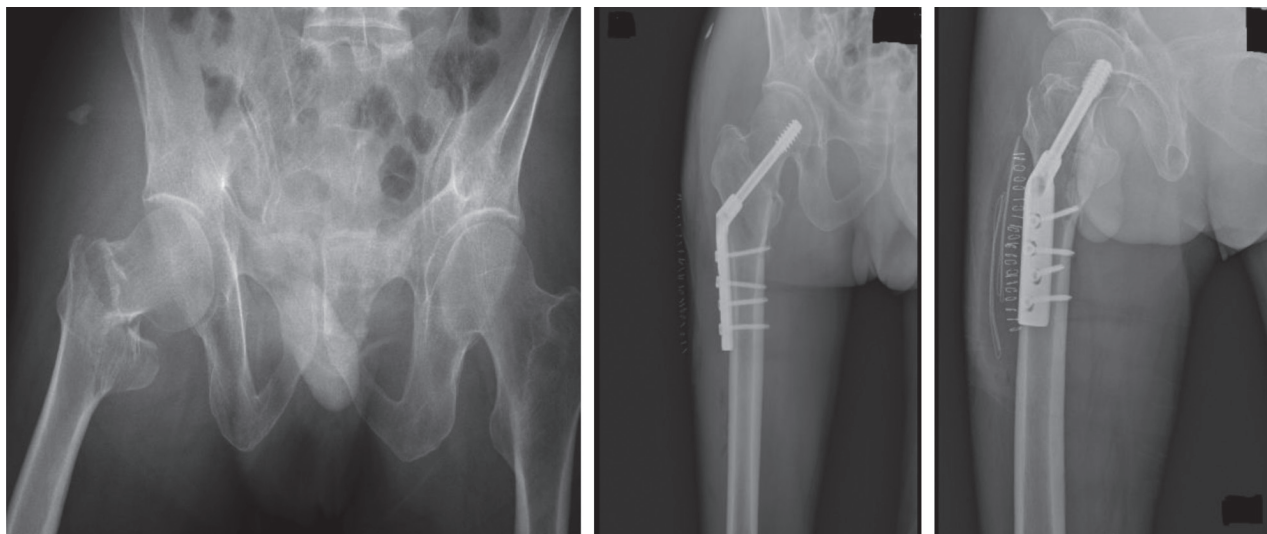


Figure 2. Pre and postoperative Rx

Postoperatively, all the patients were started on a progressive physiotherapy program. Quadriceps strengthening exercise and hip and knee joint range of motion exercises were started immediately after surgery. Full weight-bearing was allowed with the walking frame and crutches on the second day after surgery.

Results

No patients presented perioperative complications, the mean operative time was 40 minutes (range 30-55 minutes). The mean blood loss during surgery was 150 ml. No one had need to place blood drains.

All patients except one completed the physiotherapy program without any complications and returned to their normal activities. Only one patient didn't complete the physiotherapy program because had a stroke three weeks after surgery.

Discussion

Proximal femoral fractures in elderly patients represent a very significant problem in industrialized countries, due to the aging of the population.

In Italy, it is estimated that the incidence of proximal femoral fractures is approximately 90,000 per year, and that they are responsible for an annual expenditure in excess of 800 million euros in hospital costs alone. From the patient's perspective, in around 20% of cases, motor autonomy is completely lost and only 30-40% recover full autonomy in daily activities (7).

Currently, internal fixation devices for treating unstable intertrochanteric femoral fractures are classified into intramedullary fixation and extramedullary fixation devices, both of which show advantages and disadvantages (8-9).

The use of intra-medullary devices has increased over the years (10). There have been many reports which suggest that they do not show better outcomes than the DHS especially in AO/OTA 31A1 (A1) and A2 fractures (11-14).

The recent study of Han et al (15) confirms that intramedullary fixation device, are effective for unstable intertrochanteric femoral fractures with broken lateral walls.

The use of DHS for the treatment of unstable intertrochanteric fractures is still controversial. As DHS is the traditionally accepted treatment method in stable fractures with low failure rates (16), it's know to have a high complication rates in unstable fractures (17).

Other authors showed that DHS is a recommended implant designed for the fixation of unstable intertrochanteric fractures (18-20). The advantage of a DHS are a better exposure of fracture site (9, 20), no trauma to the medium gluteus, lower expenses compared with intramedullary nailing, lower post operative bleeding. The disadvantages are: longer incision with higher intraoperative blood loss, longer operative time; failures have been noted in unstable intertrochanteric fractures, which is primarily due to posterolateral wall fractures (21, 22).

The most common mechanical complication of DHS surgery is lag screw migration and subsequent hip screw cutout (23-25).

Conclusion

In this study, we have showed our preliminary experience with DHS in AO 31A1 fractures. AO 31A1 includes simple two-part fractures of the pertrochanteric area with A1.1 fractures along the intertrochanteric line, A1.2 fractures through the greater trochanter and A1.3 fractures below the lesser trochanter. All these are stable fractures with an intact posteromedial cortex.

From our preliminary experience is shown that MEDGAL DHS is a low cost implant easy to use for the treatment of stable pertrochanteric fractures.

Longer follow up is required and it will be done, to evaluate long term clinical and radiographycal results.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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