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Research Paper

Outcomes of surgical management of per-trochanteric fractures: About 363 cases

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Abstract

Background: Per trochanteric fractures are undoubtedly the lesions most frequently encountered in traumatology, particularly in the elderly, where they retain a high mortality rate

The aim of our study was to evaluate the functional and radiological results of the surgical management of per trochanteric fractures.

Materials and methods: This was a retrospective study of 363 cases of per trochanteric fractures taken care of and followed from January 2012 to December 2016. The average age was 68.89 years (23-100 years) with 59.2% men and 40.8% women. 97.5% had support (protected or not) before trauma compared with 2.5% non-autonomous. The evolution of the consolidation and functional score of Parker and Palmer was evaluated at 1; 3; 6 and 12 months.

Results: 99.2% consolidation at 3.8 months (3-8 months). The cervico-diaphyseal angle variation was 4.2° (0°-17.2°) for the overall population (p=0.0057); 4.3° (0°-17.2°) for Gamma Nail (GN) And 4.2° (0°-17°) for Dynamic Hip Screw (DHS). 94.16% had provided support (alone or protected). The mean Parker functional score at 12 months was 6.6 (0-9) overall (p<0.0001) and 6.67 (0-9) for GN and 6.65 (0-9) For DHS. Only 35% of patients had fully recovered their initial score. We had recorded 01 cases (0.27%) of deaths, 01 cases of nonunion, 04 cases of sweeping, 04 cases of late infection.

Conclusion: Our study shows that the consolidation of the fracture is not synonymous with functional recovery and autonomy. In the management of these fractures, emphasis should be placed on early support and functional rehabilitation.

Key words: per trochanteric fracture; surgical treatment

INTRODUCTION

Per trochanteric fractures are undoubtedly the lesions most frequently encountered in traumatology, particularly

in the elderly, where they retain a high mortality rate [1]. Their impact continues to increase despite a thorough knowledge of risk factors and prevention methods;

Making these lesions a public health problem. The fragility of the terrain on which they occur (elderly subjects, carriers of multiple tares) imposes management which will allow an early verticalization with rapid social reintegration. Only surgical treatment can meet these expectations. It uses several methods, either with a closed hearth by cervico-diaphyseal nail system or with an open hearth by a screw-plate or plate-plate system. Orthopedic treatment is currently abandoned, except in some countries that haven't the required medical resources [2] or when the patient cannot be anesthetized.

The aim of our study was to evaluate the functional and radiological results of the surgical management of per trochanteric fractures.

PATIENTS AND METHODS

This was a retrospective study, including all adult patients, with a per trochanteric fracture, taken care of and trained in the Trauma and Orthopedics Department B of the CHU Hassan II in Fez over a 5-year period from January 2012 to December 2016. We did not include in the study, cases of fractures on the pathological bone, patients with incomplete files as well as those who were treated orthopedically. A total of 363 cases were reported. The mean age was 68.89 years (23-100 years) with 59.2% (n=215) of men and 40.8% (n=148) of women (Fig. 1). 97.5% (n=254) had support (protected or not) before trauma compared with 2.5% (n=09) non-autonomous. The circumstances of the trauma were dominated by a small drop (in height) in 84.3% (n=306) of cases, followed by road accidents in 9.1% (n=33) cases and falls High in 6.6% (n=24) of the cases. 30% were diabetic and 24.3% hypertensive (Fig. 2). According to the Ender classification [3], 6.89% type I (n=25) stable fractures; 22.87% type II and III (n=83, moderately various instability); 16.25% type IV and V (n=59, moderately unstable with cervical impaction); 41.87% type VI (n=152, unstable trochanteric); 8.26% type VII (n=30, with trochanteric split) and 3.86% type VIII (n=14, trochanteric).

Under locoregional anesthesia most often and rarely general. Two types of osteosynthesis were performed (Fig. 3): either with a closed focal point by a cervico-metaphyseal nail (Standard Gamma Nail (SGN) or Long Gamma Nail (LGN)) or with an open hearth (Dynamic Hip Screw (DHS)). Patient follow-up: Patients had a post-operative 48h antibioprophylaxis, adapted analgesia, local daycare and control radiographs in the immediate postoperative period. Rehabilitation began on the first postoperative day with isometric contractions, ankle and knee mobilization. Patients were discharged after 24-48 hours with a functional rehabilitation note aimed at recovery of joint amplitude, muscle strengthening and proprioception. The threads were removed at

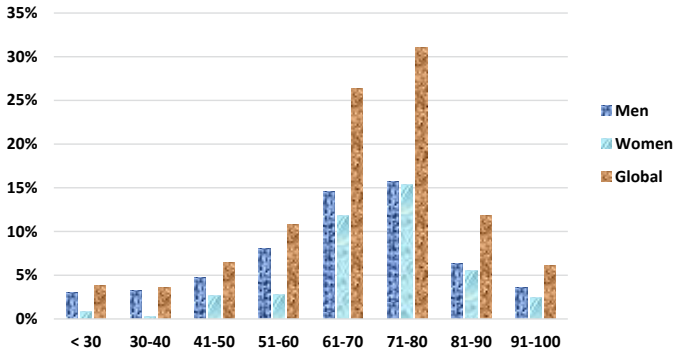
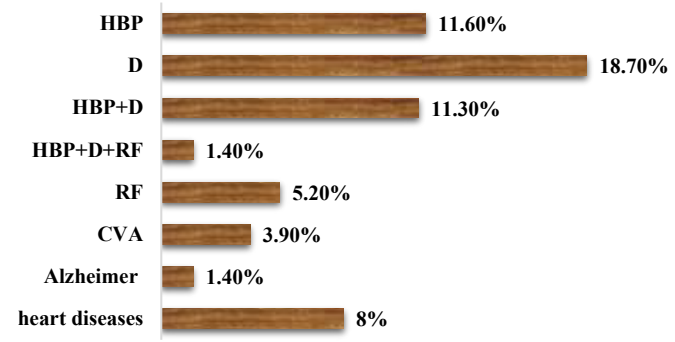
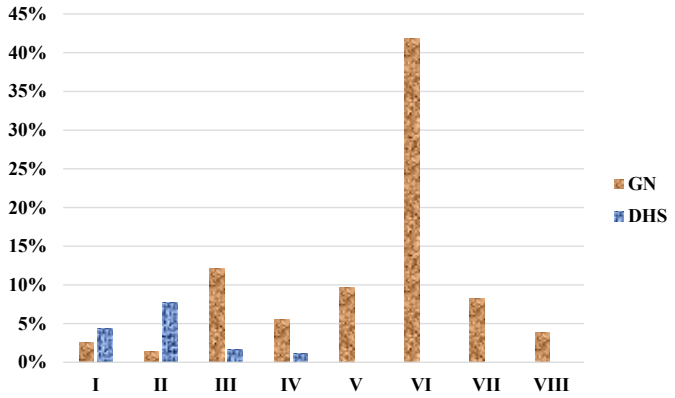


Fig. 1. Patients' distribution by age group. The peak is between 61 and 80 years old



HBP: High Blood Pressure; D: Diabetes, RF: Renal Failure; CVA: Cerebral Vascular Accident

Fig. 2. Frequency of comorbidities. These are the pathologies of the elderly subject



GN: Gamma Nail; DHS: Dynamic Hip Screw

Fig. 3. Implant distribution by fracture type (Ender classification)

21 days. The evolution of consolidation and functional score of Parker [4] was evaluated at 1; 3; 6 and 12 months. Our data were treated with the software Excel 2013 and SPSS VERSION 16.0

RESULTS

Results have been displayed in Table 1 and Fig. 4.

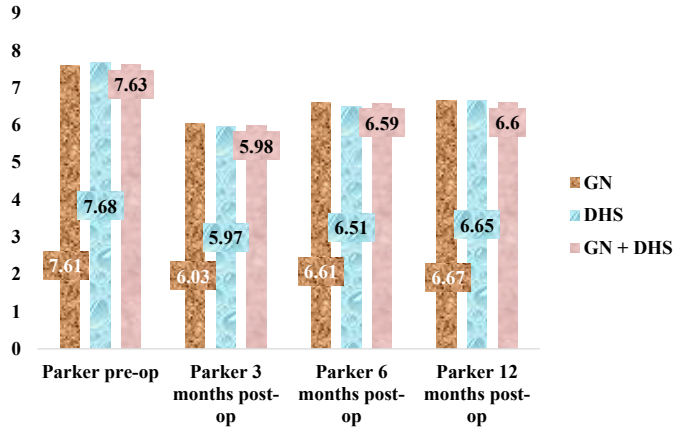
Patients were operated on average 20 hours after hospitalization (12h-48h). 85.12% (n=309) were operated by GN (77.1% by SGN and 8% by LGN); 14.88% (n=54) by DHS. The mean operating time was 44.1 mn (15-68 mn) for CG and 69.2 mn (48-82 mn) for DHS. The mean blood loss was 85.8 ml (60-130 ml) for GN and 120.3 ml (110-200 ml) for DHS. The average stay was 36h (24-72h). Consolidation was achieved in 99.2% (n=358) of cases at 3.8 months (3-8 months). The cervico-diaphyseal angle variation at the end of the consolidation was 4.2° (0°-17.2°) for the overall population (p=0.0057); 4.3° (0°-17.2°) for GNs (p=0.0063); And 4.2° (0°-17°) for DHS (p=0.0078). 12 cases of complications were recorded, dominated by sweeping of the cervical screw (05 cases); Delayed infection on the material (04 cases), non-union on DHS (01 cases) and telescoping of the cervical screw (02 cases). The rate of re-intervention was 2.2% of which 03 cases of cut-out and 02 cases of telescoping of the cervical screw as well as the case of non-union taken up by a plate-plate; 02 PTH scanning cases. The cases of infections had evolved well after removal of the equipment with surgical trimming and adapted anti-biotherapy. The mean Parker [4] functional score at 12 months was 6.6 (0-9) overall (p<0.0001) and 6.67 (0-9) for GC and 6.65 0-9) for DHS. We had recorded 01 cases (0.27%) of deaths occurred at 1 month in a diabetic patient, hypertensive and insufficient renal. After consolidation, 17 patients were lost to follow-up for 12 months.

DISCUSSION

Per trochanteric fractures are the most frequently encountered in

Table 1. Data related to surgery and hospital stay

	GN	DHS	P value
Therapeutic time	20h (12-48h)	20h (12-48h)	-
Duration of intervention	44.1 mn (15-68 mn)	69.2 mn (48-82 mn)	<0.001
Blood loss	85.8 ml (60-130 ml)	120.3 ml (110-200 ml)	<0.001
Hospital stay	36h (24-72h)	36h (24-72h)	-
complications	04 cut-out 02 telescoping 02 infections	01 cut-out, 01 non-union, 02 infections	
Recovery	06 (4 slide plate, 2 THP)	02 (slide plate)	0.679
Abbreviation: GN: Gamma Nail; DHS: Dynamic Hip Screw; THP: Total Hip Prosthesis			



GN: Gamma Nail; DHS: Dynamic Hip Screw

Fig. 4. Functional results at different periods according to parker score

orthopedics with an overall incidence of about 1.3 million per year in 1990, estimated at 4.5 million per year by 2050 [5]. They are typical of the elderly with a major socio-economic impact [6,7-10]. In our series, 75.4% are over 60 with a peak between 70-80 years and only 7.4% are under 40 years. Despite their advanced age, patients need to regain their autonomy.

Surgical treatment is the only method by which early mobilization can be achieved. It would reduce the complications associated with prolonged bed rest in these fragile and often carriers multiple tares subjects (Fig. 2). Several types of devices have been described for the management of per trochanteric fractures [11,12]. Each with its advantages and its disadvantages. The choice of treatment is controversial and depends on the surgeon. This choice will be made in order to obtain good functional results. In a study reported by S. Sciacca et al, 69.2% of surgeons use the gamma nail against 25% using a DHS [13]. The gamma nail as shown by many studies gives better results with better stability, short operative time, minimal approach and less bleeding compared to the screw-plate system [14,15]. In our study, we had an average blood loss of 85.8 ml for the GN compared to 120.3 for the DHS. The literature reports a significantly lower blood loss in the GN compared to DHS as well as operative time [16-19]. This is explained by the minimal surgical approach in GN. The bed rest caused by the fracture should be limited as much as possible at the expense of early verticalization. This would be considerably reduced by a short therapeutic period (time between trauma and surgery, our series: 20 hours), a short hospital stay (our average: 36 hours), early rehabilitation (between the 1st and 2nd postoperative day) and the therapeutic choice mentioned above. In addition to muscle strengthening, joint amplitude recovery, and proprioception, patients were educated about the motivation and risks associated with prolonged bed rest. These parameters would influence functional outcomes and facilitate patients' reintegration. It has been shown in the literature [20-22] that after a state of stress such as a fall with a fracture of the proximal end of the femur, psychosomatic disorders would result which would form what the authors have called the Motor disability syndrome do [22,23] whose frequency in the elderly is not yet established. The results of our series show that despite a consolidation rate of 99.2% (the remaining 0.8% concern the 02 cases taken up by PTH and death) only 94.16% (n=339) (Alone or protected). This support was little or no pain between the 3rd and the 5th month, corresponding to the average consolidation time of 3.8 months.

Our mean preoperative Parker score was 7.63. At 12 months postoperative it was 6.6; A loss of 1.03 points. Only 35% of patients had fully recovered their initial score, all under 60 years of age in the average age of 68.89 years (23-100 years). This rate is higher than that of Foganolo by 32% on a population aged 76.4 years (50-93 years) [24]. Loubignac report an average Parker score at 6 months postoperatively of 7.52 [25], similar to our preoperative score. This difference would suggest that the study population had more patients in fairly good general condition. Some complications were recorded in our series. Others have also been reported as a type of intraoperative fracture of the greater trochanter, fracture under the nail [14,26-28]. These complications are related to the porotic state of the bone at this age and sometimes to the incorrect positioning of the cervical screw as is the case in the scanning of the cervical screw. We had an infection rate of 1.1% divided equally between GN and DHS that is 0.55%. However, DHS (02/54) infected more often than GN (02/309) with P<0.001. Infection was delayed between 7 and 9 months and in all cases in diabetic patients. This could be due to haematogenous spread from an infectious focus at a distance. The literature reports an infection rate between 0.15% and 15% [29]. The only case of death that we have recorded supports the idea of decompensating of the tares by bed rest.

RESULTS

99.2% consolidation at 3.8 months (3-8 months). The cervico-diaphyseal angle variation was 4.2° (0°-17.2°) for the overall population (p=0.0057); 4.3° (0°-17.2°) for Gamma Nail (GN) And 4.2° (0°-17°) for Dynamic Hip Screw (DHS). 94.16% had provided support (alone or protected). The mean Parker functional score at 12 months was 6.6 (0-9) overall (p<0.0001) and 6.67 (0-9) for GN and 6.65 (0-9) For DHS. Only 35% of patients had fully recovered their initial score. We had recorded 01 cases (0.27%) of deaths, 01 cases of nonunion, 04 cases of sweeping, 04 cases of late infection.

CONCLUSION

Per trochanteric fractures constitute a public health problem and are the prerogative of the elderly, a field that presents several comorbidities. Our study shows that the consolidation of the fracture is not synonymous with functional recovery and autonomy. In the management of these fractures, emphasis should be placed on early support and functional rehabilitation. For elderly people, in particular, emphasis should be placed on preventing falls in particular.

CONFLICT OF INTEREST

No conflict of interest.

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