

Petrochanteral Fractures: Complications and Results of Osteosynthesis by Dynamic Hip Screw(DHS) Vis-Plate without Fluoroscopy in Niger

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Abstract

Introduction: Petrochanteric fractures are frequent fractures. They are the prerogative of the elderly, affecting the young man as a result of a high energy mechanism. The complications are sometimes formidable. Different treatments are possible. In some cases, DHS screw-plate osteosynthesis easily reduces these petrochanteric fractures. The main objective of this work was to study the infectious complications and consolidation defects of DHS screw-plate osteosynthesis of petrochanteric fractures. The secondary objective was to assess functional results. Our hypothesis was that the complication rate was low.

Materials and methods: This was a retrospective single-center study including internal fixation by DHS screw-plate (March 2017 to May 2020) excluding patients with severe comorbidity.

Results: The series includes 36 internal fixation: 30 predominantly male (83.33%) and young (mean age: 39.1 years) patients, with an average follow-up of 18 months. thirty-four fractures were analyzed. We noted two cutaneous or infectious complications, one of which required revision surgery. One patient had to undergo revision surgery for early unraveling of the osteosynthesis material. The mean PMA score was 12.2: 4-18. Functional results were excellent in 34% and good in 31% of cases. The unstable fractures had a poor prognosis.

Discussion: We found a slightly lower complication rate than in the literature. Functional scores were slightly lower. Dysesthesia of the superior gluteal nerve is a relatively common complication. Two thromboembolic disorders. A high rate of complications and sometimes modest results encourage reflection on the surgical technique and its indication. Minimally invasive and fluoroscopic approaches remain the solution in all cases.

Conclusion: The management of petrochanteric fractures must be an à la carte surgery, taking into account in our context the technical platform, the patient's condition, and the associated lesions, since the complications associated with open-site surgery without fluoroscopy is not negligible.

Keywords: Petrochanteric Fractures • Osteosynthesis • DHS Plate • Complications

Introduction

Petrochanteric fractures remain a formidable prognosis in the elderly and functional in the young subject. They generate a considerably heavy social cost for our societies [1]. No Nigerian register covers the annual death and loss of autonomy associated with these injuries. Niger, a country with limited resources, the use of fluoroscopy remains very problematic in places. The use of the DHS plate screw without fluoroscopy and without an orthopedist

table remains for us an intermediate solution in the management of our patients. The objective was to know if we have equivalence in terms of consolidation and functional result.

Materials and Methods

We carried out a single-center retrospective study at the Niamey General Reference Hospital. We included patients operated on for a petrochanteric fracture osteosynthesized by a DHS screw-plate

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between March 2017 and May 2020, so as to have sufficient follow-up to assess the endpoints, in particular radiographic. Patients with severe co-morbidities (severe heart disease, dialysis, osteoporosis, arterial disease, unstable diabetes), unwitting patients or psychiatric problems incompatible with monitoring were excluded.

Surgical technique

The Watson-Jones antero-lateral hip approach was used in our series. The patients are installed in dorsal decubitus on an ordinary table a small block lifting the buttock on the operated side. The landmarks are represented by the anterosuperior iliac spine, the greater trochanter and the iliac crest. The route reaches the anterior face of the parietal projection of the trochanteric mass stopping at four through the fingers of the anterosuperior iliac spine for the upper part (particularity linked to our series). The lower vertical part, along the lateral aspect of the femur, the upper end of which is at the height of the top of the greater trochanter. The low skin incision depends on the length of the plaque. Aponeurotomy of the fascia lata from top to bottom in a direction parallel to the skin incision and in the direction of its fibers. Disinsertion in inverted L of the vastus lateralis. Careful hemostasis along the way. On this anterior face of the capsule is gradually released just at its base to be able to see the direction of the cervix and have an excellent day on the reduction. After exposure of the fracture site, reduction was obtained by traction in external or internal rotation, ensured and maintained by an operator's assistant (without an orthopedic table). The cervical aiming for the cervical screw bed was performed blindly in the direction of the cervix using an angle measurer between 130° and 135°. Thus the plate will be placed and fixed. The number of screws depends on the proximal diaphyseal split. The osteosynthesis follows the principles of AO and is done using a plate screw (DHS) of the appropriate size and allowing stable fixation. The drain was removed 48 hours later. The postoperative period allows early mobilization, relief and walking using a walking frame (walker) for a period of 45 days.

Complication assessment

It was based on patient follow-up and medical records, noting the occurrence of delayed healing of more than three weeks and infection of the surgical site, which required revision or not. The other complications were also collected: thromboembolic complications (phlebitis, pulmonary embolism), dysesthesia of the superior gluteal nerve, of the sciatic nerve, loosening of the osteosynthesis material, secondary displacement, callus vicious, pseudarthrosis, inequality of length of the lower limbs and algodystrophy.

Table 1. Patient characteristics series.

| Item | Number | Percentage |
|--|--------|-------------|
| Gender (H/F) | 29-May | 85,30/14,70 |
| Sex ratio | | |
| Average age 39,1 years (19,5-62) | | - |
| Average decline 18 months (16-40) | | - |
| Average time between admission and surgery 6.3 days (0-12) | | - |

Functional outcome assessment

The clinical results were assessed according to the Perles-Merles-Aubigné criteria ([1] assessing pain, mobility and gait). Pain was also jointly assessed by a standard visual analogue scale (VAS). According to the PMA score, the results were considered excellent at 18, very good at 17, good between 16 and 15, average, mediocre and bad for scores over 14 and 13, between 12 and 10, below 9, respectively. Radiographic assessment Immediate postoperative radiographs and then during follow-up were performed to monitor the occurrence of secondary displacement, delayed union, pseudarthrosis as well as unraveling of the osteosynthesis material [2].

Statistical analysis

The characteristics of the population were described in absolute value and proportion (percentage) for the qualitative variables, as an average (minimum, maximum) for the quantitative variables.

Results

Our series included 36 pertrochanteric fractures, including 29 men (80.55%) and 7 women (19.44%). Average age 39.1 years 19.5-62. The mean time from admission to surgery was 6.3 days 0-12. The fractures were classified radiologically and were distributed as follows (Table 1). The circumstances of the accident were 21 high kinetic road accidents, six work accidents, three sports accidents and six other domestic accidents). The fracture was unstable in five cases, or 13.88% (all Ender type 6). Two patients were lost to follow-up, so we were able to analyze 34 osteosyntheses by DHS screw-plate. Associated fractures were frequent (8 cases, or 22.22%), mostly in the lower limbs. An airplane boot was used in five cases (13.88) for the unstable cases. The mean hospital stay was 14 days, mostly due to associated injuries and/or fear of secondary displacement. The mean follow-up was 12 months. (0-36) Functional results the mean PMA score was 12.2 ± 1.7: 4-18. Functional results were excellent in 34% of cases, good in 31% of cases, fair and poor in 35% of cases [3]. The main complaint presented by the patients was pain, present in 52.9% of patients (18/34). Stable fractures had a better PMA score than unstable fractures, but the difference was not significant (p=0.2)(Figure 1).

| | |
|---|---|
| Average size of skin incision 8 cm (7-14) | - |
| Average duration of the intervention 49 mm (40-110) | - |
| Average blood loss 400ml (300- 800) | - |

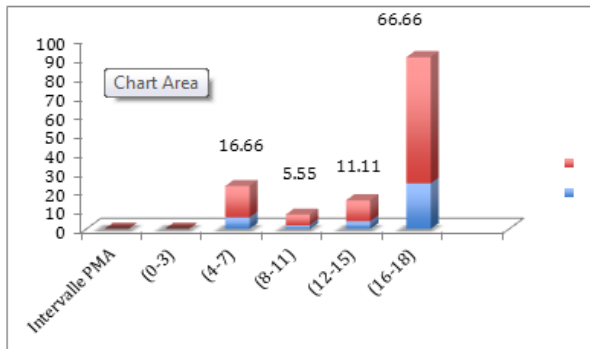


Figure 1. PMA score of the series. Note: (-) Men, (-) Women

Discussion

This was a retrospective study on patient files and reviews, and is therefore subject to certain methodological criticisms. The strengths of our study are a setback that remains relatively acceptable and little overlooked for a series of trauma emergencies in precarious environments. In addition, the use of validated scores (PMA) gives our results a standardized assessment. There is thus a recruitment bias due to the relatively high number of patients contacted by telephone who do not manage to rate their pain properly and to estimate their daily activities. Susceptibility bias is well controlled by placing a single implant in all patients in the series (Dynamic Hip Screw).

Table 2. Radiological classification of Ptertrochanteric fractures in the series AO Percentage.

| AO | Percentage | ENDER | Percentage |
|----------|------------|--------------|------------|
| A11 5/34 | 14,70 | Type1 4/34 | 11,76 |
| A12 3/34 | 8,82 | Type2 4/34 | 11,76 |
| A13 4/34 | 11,76 | Type 3 5/34 | 14,70 |
| A21 2/34 | 5,88 | Type 4 11/34 | 32,35 |
| A22 9/34 | 26,47 | Type 5 2 /34 | 5,88 |
| A23 6/34 | 17,64 | Type 6 2 /34 | 5,88 |
| A31 1/34 | 2,94 | Type 7 1/34 | 2,94 |
| A32 1/34 | 2,94 | Type 8 1 /34 | 2,94 |
| A33 3/34 | 8,82 | | |

Complications

We noted two dysesthesias of the superior gluteal nerve, delayed healing, one phlebitis, two infections of the surgical site. Surgical site infections required revision for debridement, lavage and sampling. Antibiotic therapy was then put in place. This strategy had allowed the infection to dry up and dry up. No case required removal of the material before consolidation. A case of early unraveling linked to the very unstable nature of the fracture lesion. An inequality in the length of the lower limbs of less than 3 cm for which a wedge had been prescribed. One case of death related to pulmonary embolism, this was the natural course of the recorded phlebitis (Table 2).

This work corresponds to a bi-operator but monocentric series, which can influence the quality of the result. This represents a performance bias. The limits are the size of the series, undoubtedly due to a large proportion of outings against medical advice and the solicitations also of bones. The power of our study is limited by this small sample. The examiner who collected the data was different from the operators and was neither the promoter nor the designer of the implanted material. This should in principle increase the objectivity of the study. The best way to manage ptertrochanteric fractures is to use the image intensifier. Surgery for ptertrochanteric fractures in our series, is the choice before which no possibility remains possible, so taherefore constitutes a performance limit (Table 3).

Table 3. The complications of the series.

| Complications | Number | Percentage |
|-----------------|--------|------------|
| Thromboembolic | 1 | 2,94 |
| Infections | 2 | 5,88 |
| ILMI | 1 | 2,94 |
| Early debugging | 1 | 2,94 |
| Pseudarthrosis | 1 | 2,94 |
| Death | 1 | 2,94 |
| Total | 34 | 100 |

Despite the insufficient technical platform, our results are superimposable on those of the literature [4,5]. Surgical site infections were the most feared fear in our series. These complications were only in 5.8% in our series [6]. The infections in the series may be related to a brown malnutrition observed in these patients. A case of non-union for which no cause was determined. Undernutrition is a known risk factor for pseudarthrosis and delayed healing in the literature [6]. This is a pejorative factor on the functional results in our study, it is also consistent with the results of studies on pertrochanteric fractures [5,6]. One patient in our series presented with dysesthesia of the superior gluteal nerve, a feared complication of anterolateral surgical treatment according to Watson-Jones. This complication was found with a rate of less than 5% in the literature [4]. Plate osteosynthesis has been shown to give the best overall results, skin complications being prevented by following basic rules before surgery. However, the risk of complications remains relatively little described in the literature [5,6]. Mini-approach techniques minimize skin risk and blood loss and allow good reduction [6]. The functional results were encouraging in our series. Pain was admittedly rated with difficulty. The mean PMA score for the series was superimposable on literature [6]. This result could be related to the young nature of our patients, but also the selection which entirely excludes subjects with severe comorbidity. Several series evoke an aging character of populations with sometimes difficulties of functional restoration or even loss of autonomy [5,6].

Conclusion

Our main hypothesis has been verified. Trochanteric fractures constitute a health problem in Niger not of diagnosis but of management. The management of pertrochanteric fractures must be an à la carte surgery, taking into account in our context the technical

platform, the patient's condition, and the associated lesions, because the complications associated with open-site surgery without fluoroscopy do not are not negligible. Unfortunately, their seriousness can jeopardize the patient's vital prognosis and induce socio-economic consequences. A multicenter study should confirm the complications and functional results of surgery for pertrochanteric fractures without fluoroscopy.

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