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Results of surgical treatment of fractures of the distal humerus at the Brazzaville university hospital

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ABSTRACT

Background: The objective of the study was to evaluate the functional and anatomical results of the surgical treatment of fractures of the distal humerus at Brazzaville University Hospital using non-anatomical plates.
Methods: This was a retrospective study of patients operated by screwed plates for fracture of the distal humerus at Brazzaville University Hospital between January 2014 and December 2017. The study included 11 patients operated by non-anatomical plates and responding the inclusion criteria. Fractures of the distal humerus were distributed according to the AO classification of Müller and Nazarian. The functional results were evaluated according to the Mayo Clinic score based on 4 criteria: pain, mobility bow, stability and functional capacity.
Results: There were 8 men and 3 women. The average age was 35 years (range 23 to 50 years). Causes of the trauma were a road accident in 7 patients and a fall in 4 patients. The site involved in the trauma was lateral right in 7 patients and left in 4 patients. The average time to surgery was 7 days (range 5 to 12 days). All our patients have consolidated in first intention. The average time to consolidation was 3 months (range 3 to 4 months). Results at the average follow-up of 9 months were considered excellent in 3 patients, good in 6 patients and average in 2 patients.
Conclusions: Osteosynthesis of fractures of the distal humerus remains a challenge in developing countries. Our experience shows that surgical treatment of fractures of the distal humerus by non-anatomic plates can give good results when bone stabilization is satisfactory and rehabilitation is undertaken early.

Keywords: Fracture, Distal humerus

INTRODUCTION

Fractures of the distal humerus are a rare in adults; they represent 2% of fractures.[1,2] Their treatment is essentially surgical by the use of special plates suitable to the morphology of the distal epiphysis of the humerus.[2,3] This therapeutic modality aims to anatomically reduce the fracture, fix it firmly and allow early rehabilitation of the elbow. In developing countries, anatomical implants adapted to the distal epiphysis of the humerus are not always available. The aim of our work was to evaluate the functional and anatomical results of the surgical treatment of fractures of the distal humerus at Brazzaville University Hospital using non-anatomical plates.

METHODS

Patients

This is a retrospective study of patients operated by screwed plates for fracture of the distal humerus at Brazzaville University Hospital between January 2014

and December 2017. We included in this study, patients operated for fractures of the distal humerus patients with a follow-up of more than 6 months. Fractures of the distal humerus were distributed according to the Müller and Nazarian AO classification 4.

Therapeutic protocol

Surgery was conducted in all patients under general anesthesia. Patients operated by posterior approach (n=9) were placed in lateral decubitus, thoracic limb supported by a support under the arm, elbow flexed at 90°; Patients operated by lateral approach (n=2) were placed in the supine position. The trans-tricipital tract with reverse V triceps disinsertion was used in 8 patients and the trans-olecranon route in 1 patients. Triceps repair was performed by suturing and repairing the olecranon by guying. Following surgery, a posterior plaster splint, locking the elbow in 90º was applied and kept for 30 days when the assembly was judged not very stable or in the case of a trans-trital route. Functional rehabilitation of the elbow was started after removal of the provisional immobilization.

Evaluation methods

Anatomical evaluation was based on the quality of fracture reduction and bone healing. The functional results were evaluated according to the Mayo Clinic score 5 based on 4 criteria: pain, mobility bow, stability and functional capacity. Our data has been entered and analyzed on the Microsoft Excel software.

RESULTS

Figure 1 indicates patient distribution according to sex. The average age was 35 years (range 23 to 50 years).

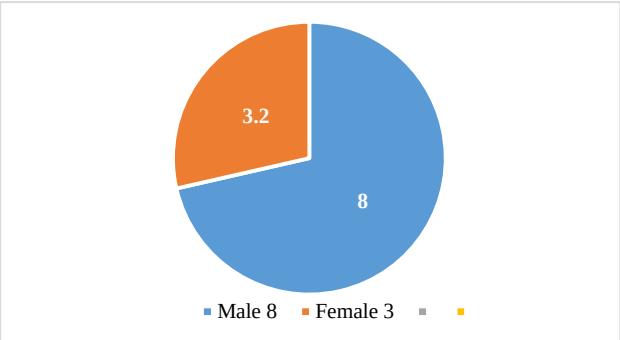

Figure 1: Patient distribution by sex.

Table 1 indicates patient distribution according to etiology. Table 2 shows the distribution of 11 fractures according to the AO classification of Müller and Nazarian.

As an associated lesion, there was a homo-lateral fracture of the ulna.

Table 1: Patient distribution by etiology.

Etiology	Number
Road accident	7
Fall	4
Total	11

Table 2: Distribution of the 11 fractures according to the AO classification of Müller and Nazarian.

Type de fracture	Number
Fracture type A2	2
Fracture type A3	7
Fracture type C1	1
Fracture type C2	1
Total	11

Table 3 shows patient distribution according to the side involved in the trauma.

Table 3: Patient distribution by side.

Side	Number
Right	7
Left	4
Total	11

The average time to surgery was 7 days (range 5 to 12 days). The average duration of hospitalization was 12 days.

Figure 2: (A) Müller and Nazarian type A3 fracture; (B) bone healing after osteosynthesis.

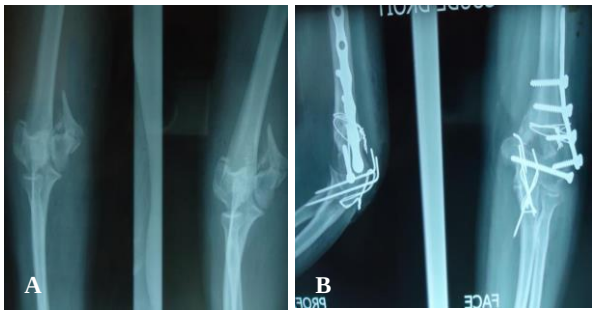

Figure 3: (A) Müller and Nazarian type C2 fracture; (B) bone healing after osteosynthesis.

Anatomically, the reduction was satisfactory in all cases (Figures 2 and 3). All our patients have consolidated in first intention. The average time of consolidation was 3 months with extremes of 3 months and 4 months.

Table 4 shows the results by fracture type according to Mayo clinic score, the results at the average follow-up of 9 months.

Table 4: Results by fracture type according to Mayo clinic score.

Fractures	Results	Number
Type A2	Excellent	2
Type A3	Excellent	1
Type A3	Bon	6
Type C1	Moyen	1
Type C2	Moyen	1
Total		11

DISCUSSION

Our short series of 11 cases remains limited by the size of our sample. Nevertheless, it corroborates the data of the literature on most points. Reduced frequency, average age of 35 in our series. Saragaglia et al.[3] report an average age of 46±23 years. Fractures of the distal humerus are often secondary to high-energy trauma in adults. In the elderly, however, because of osteoporosis, they often occur as a result of low-energy trauma. Pathologically, fractures of the distal humerus are often complex and displaced. The predominance of AO type A3 fractures observed in our series is similar to that of Shaps et al in Canada.[4,6] The majority of authors report a predominance of type C fractures in their series.[3,7-9] Therapeutically, the choice of fracture treatment of the distal humerus is operative to allow anatomic reconstruction and stable fixation for early mobilization of the elbow.[2,3] In developed countries, fractures of the distal humerus are urgently treated with anatomical implants. LECESTRE and inverted Y Lambda plates remain the most used plates in the majority of European studies.[2,3,10] In developing countries, on the other hand, the choice of implant depends mainly on the technical platform.

In our series, all patients benefited from a non-anatomical non-premolded implant that was adapted intraoperatively to the morphology of the distal humerus. The average patient management time observed in our series is almost comparable to that of Mekiela et al in Gabon.[9]

Elbow surgery imposes a strict rigor in the reconstruction of the distal epiphysis of the humerus in order to avoid morphological or functional sequelae.[7] The stiffness of the elbow is the most common complication of fractures of the distal humerus.[3] For us, the cases of elbow stiffness observed in our series is the result of the therapeutic delay and the use of non anatomical plates that do not stabilize the fracture and do not allow an early mobilization of the elbow. About elbow prostheses, to guarantee the functional result, some authors advocate the rehabilitation of the function of the elbow by the establishment of a prosthesis immediately in comminuted fractures with articular component or in the fractures of the elderly subject on porous bone.[11,12]

CONCLUSION

Surgical treatment of fractures of the distal humerus remains a challenge in developing countries due to the absence of anatomical plaques. Our experience shows that osteosynthesis of fractures of the distal humerus by non anatomical plates can give good results when the bone stabilization is satisfactory and the reeducation undertaken early.

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