

Outcomes of Malleolar Fracture Osteosynthesis in Cotonou: A Review of 31 Cases

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DOI: [10.36347/sasjs.2022.v08i02.006](https://doi.org/10.36347/sasjs.2022.v08i02.006)

| Received: 16.01.2022 | Accepted: 22.02.2022 | Published: 28.02.2022

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Abstract

Original Research Article

Introduction: Malleolar fractures are joint lesions which are instable in most cases, cause the disorganization of ankle clamp and require operational treatment. This study aims to assess the morphological and functional outcomes of malleolar fracture osteosynthesis in our work settings characterized by limited resources. **Methodology:** This is A five-year retrospective involving 31 individuals treated using surgical procedures and who benefited of close follow-up on in the postoperative period. The anatomical assessment was based on the Lecestre and Ramadier criteria whereas the functional evaluation used the AOFAS criteria. **Results:** The mean duration of malleolar fracture consolidation was 17 weeks. The anatomical outcomes were well performed in 67.74% of cases, fair in 29.03% and, worse in 3.23%. The mean AOFAS score was 83.97. Reported complications included ankle osteoarthritis (2 cases), lateral malleolus pseudarthrosis (01 cases), and algoneurodystrophy (01 cases). **Conclusion:** Despite our limited resources, our study osteosynthesis of malleolar fractures revealed satisfactory outcomes in our settings.

Keywords: Malleolar fracture – ankle osteosynthesis.

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INTRODUCTION

The malleolar fractures are the third most common traumatic musculoskeletal injuries following fractures of the wrist and the upper end of the femur [1]. In most cases, they are unstable joint lesions which affect the malleolar clamp [2]. Overtime, they are potential causes of disabling degenerative problems such osteoarthritis. Studies have showed that surgical management of malleolar fractures using anatomical reduction and internal osteosynthesis is the gold standard and predictor of good outcomes [3, 4]. This study aims to assess the morphological and functional outcomes of malleolar fracture osteosynthesis in low-income settings.

METHODS

This retrospective study involved adult patients treated by osteosynthesis for malleolar fractures at the University Clinic of Orthopedic Traumatology and Reconstructive Surgery (CUTO-CR) of the CNHU-HKM of Cotonou from June 1, 2015, to May 30, 2020. We enrolled 31 patients with malleolar fractures;

among which 18 men and 13 women, (i.e. a sex ratio of 3.25 for M: F). At the time of accident, the mean age of study participants was 42.83 years (ranging from 16 to 68 years). The mechanisms of malleolar fractures were majorly the road traffic accidents (n=23), home accidents (n=6), and sports accidents (n=2). Assessment of fractures revealed three types which are the uni-malleolar (n=10), bi-malleolar (n=18), or tri-malleolar (n=3) fractures; among which 16 were open fractures and 15 were closed fractures with one (01) was categorized type I, five were type II and 9 were classified type III using the classification of Gustillo and Anderson [5].

The average time of the surgical management was 6 days (with the minimum duration of 1 and the maximum of 36 days); for closed and open fractures, this duration ranged between 7.5 days and 4.33 days, respectively. Pin (n=16) or screwed third tube plate (n=12) fixation was used on the lateral malleolus, and pin (n=4) and screw (n=15) fixation was used on the medial malleolus; no fixation was done on the posterior malleolus. The Lecestre and Ramadierscore [6] was

used to measure the quality of the decrease, while the OAFAS functional score [7] was utilized to examine the functional effects (American Orthopedic Foot and Ankle Score).

RESULTS

During the postoperative period, using the Lecestre and Ramadier score, the anatomical reduction was better in 21 cases (67.74%), fair in 9 cases (29.03%), and poor in 1 case (3.23%). A case of superficial infection was demonstrated by our results: it was constituted by minor and cleared with local treatment.

The median timing of postponement of treatment was 34 months and the mean duration of fracture consolidation was achieved in average period

of 17 weeks (minimum of 10 and maximum of 26 weeks). The mean AOFAS score was 83.97 based on level of functionality. The majority of the outcomes were better or exceptional (Table 1). Closed fractures and open fractures had nearly identical AOFAS scores of 85.44 and 82.40, respectively. Results did not demonstrate poor functional outcomes.

Two cases of ankle osteoarthritis were reported and occurred from an open bimalleolar fracture type III of Gustilo and Anderson and were treated using lateral pinning and medial bracing. In one case, the anatomical outcomes were better, while in others, they were categorized fair. Additional complications were constituted by a case of pseudarthrosis following lateral malleolus pinning and a case of algoneurodystrophy.

Table-1: Distribution of patients according to AOFAS score

AOFAS Score	Frequency	Percent (%)
Very Excellent (90-100)	11	35,48
Excellent (70-89)	17	54,84
Middle (50 à 69)	03	9,68
Poor (< 50)	00	00
TOTAL	31	100

ICONOGRAPHIE



Fig-1: Traitement par plaque 1/3 de tube latéral et vissage médiale d’une fracture fermée bi malléolaire Radiographie préopératoire (a, b), et post-opératoire (c, d)



Fig-2: Fracture bi malléolaire traitée par broche malléolaire latérale et haubanage médiale Radiographies préopératoires (a, b) post-opératoires (c, d)

DISCUSSION

Our study reveals that the anatomical outcomes in the case series were largely better, similar to those of Yao [8] and Ayouba [9] in Ivory Coast and Togo, respectively. The use of pins for lateral malleolus synthesis showed significant outcomes for open fractures in our work settings. Despite it has few outcomes compared to standard guidelines, the use of pins is performed in African countries owing to its lower cost for people who do not have health insurance [10, 11]. Conversely to Chigblo [12] who revealed two disunions following the surgical treatment of malleolar fracture, our study did find any disunion or any abnormal bone scar. In fact, we did not perform the surgical reparation of any ligaments, including the internal lateral ligament, in this case.

Numerous authors have shown that the lack of treatment of the LLI is a predictor of long-term osteoarthritis [13], but our results suggest that poor initial reduction of fractures plays a crucial role in the occurrence of osteoarthritis. In addition, one of the two cases of osteoarthritis in our study had middle anatomical outcomes, which could lead to insufficient consolidation. Regarding the functional assessment, two-third of our participants reported periodic pain associated without severe implications on the ankle function during their last review.

The shortness of delay of management of open fracture may explain the expense of the material utilized due of the skin opening, which is essentially pins more or less steel wire. However, we found no significant differences in functional outcomes based on treatment duration; the AOFAS score for open fractures with a shorter treatment time and closed fractures with a longer treatment time was nearly comparable longer. Our study has the limitations related to the small sample size and its retrospective design.

CONCLUSION

Our findings show that the surgical management of malleolar fractures was relatively satisfied for the anatomical and physiological outcomes, despite the challenges of restricted resources in our work settings. Shorter treatment duration could improve these functional outcomes even further.

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