

CASE REPORT

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Distal femur fractures, when double plate is mandatory: A case report

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ABSTRACT

Introduction: Distal femoral fractures pose significant challenges in terms of surgical management due to their complex anatomy and potential for non-union.

Case Report: This article presents a case study of a 44-year-old male patient who sustained an open comminuted distal femur fracture following a road accident, highlighting the treatment approach and outcomes. Definitive treatment involved the use of both lateral and medial distal femoral plates, employing a double approach.

Conclusion: The discussion emphasizes the importance of addressing factors such as medial metaphyseal comminution and osteoporosis in achieving stable fixation and reducing the risk of failure. The utilization of double plates is advocated as a mean to stabilize both distal femoral columns, thereby enhancing stability and promoting successful outcomes in challenging fractures.

Keywords: Distal femur fracture, Double approach, Medial plate, Trauma

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INTRODUCTION

Distal femoral fractures represent 3–6% of femoral fractures, accounting for 0.4% of all fractures [1]. They present a bimodal distribution. Despite the reduced prevalence, osteosynthesis can be complex, requiring anatomical reduction and sufficiently stable fixation to allow early mobility of the knee [2]. Historically, osteosynthesis is based on the use of locked lateral plates and is associated with a non-union rate that can reach up to 20% [2, 3].

CASE REPORT

We present the case of a 44-year-old male patient who suffered a Gustillo-Anderson Grade IIIA exposed distal femur fracture (classification AO33C3) after a road accident (Figure 1). Initially he underwent cleaning and debridement and osteotaxis with external fixators (Figure 2). At two weeks definitive treatment was carried out using lateral distal femoral and medial femoral plates, with a double approach—lateral and medial (Figure 3). Due to the comminution of the fracture, full exposure of the fracture site was needed for correct reconstruction, with the plates acting as bridging plates. The patient had an uneventful postoperative period. At six months postoperatively he had limited mobility (0–50° of flexion) and radiological examinations showed delay on the consolidation of the fracture site (Figure 4). He underwent new surgery—quadricepsplasty, decortication, and application of an autograft. After this new intervention, he progressed well clinically with follow-up at 12 months with complete mobility and consolidation of the fracture on radiological examinations (Figure 5).



Figure 1: (A) AP, (B) lateral Gustillo-Anderson Grade IIIA exposed distal femur fracture.



Figure 2: 3D view of CT scan after external fixator application.

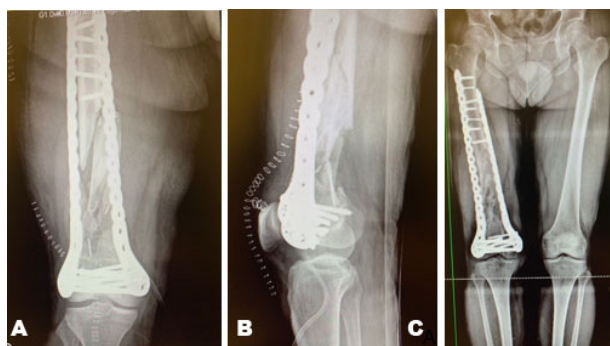


Figure 3: (A) AP, (B) lateral, (C) long view radiographs depicting definitive treatment carried out using lateral distal femoral and medial femoral plates, postoperatively.

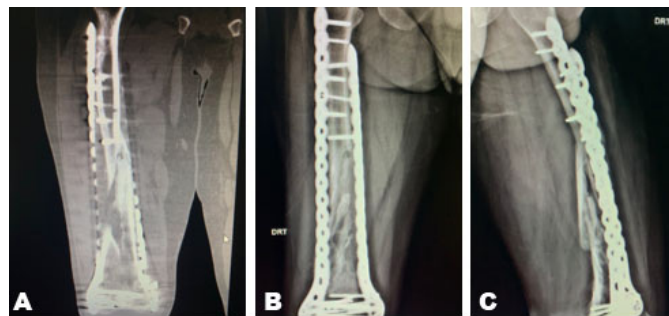


Figure 4: (A) CT scan, (B) AP, (C) oblique view radiographs at six months post-op.

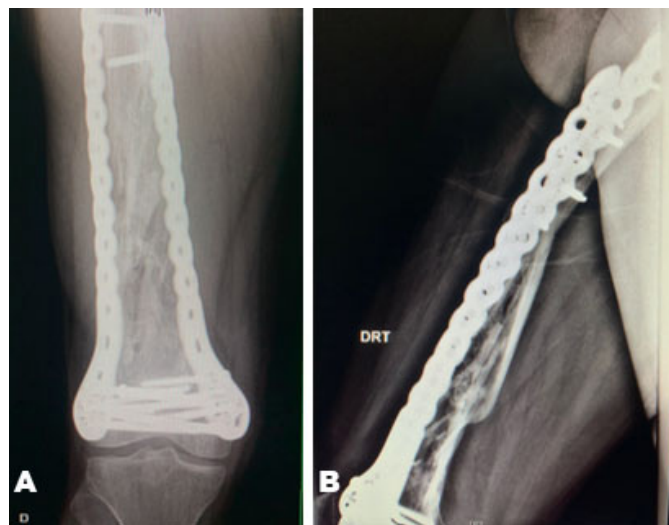


Figure 5: (A) AP, (B) oblique view radiographs at 12 months post-reintervention, showing consolidation.

DISCUSSION

Medial metaphyseal comminution, osteoporotic bone, and insufficient fixation lead to varus collapse or non-union in this type of fracture [4, 5]. The use of double plates allows the two distal columns of the femur (lateral and medial) to be stabilized, resulting in stable fixation in supracondylar comminuted femoral fractures, low periprosthetic fractures and in cases of non-union [6–10].

CONCLUSION

The adjuvant use of a medial plate reduces the rate of osteosynthesis failure while not resulting in an increase in intraoperative bleeding losses or surgical complications, with equal functional results.

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Author Contributions

Nuno José Abrantes Botelho Maia – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Érica Marto – Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Francisco Rodrigues – Acquisition of data, Revising the work critically for important intellectual content, Final

approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Fernando Oliveira – Acquisition of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

João Diogo Silva – Acquisition of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

João Pedro Caetano – Conception of the work, Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

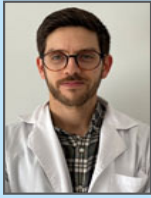
All relevant data are within the paper and its Supporting Information files.

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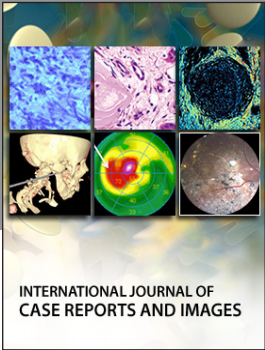
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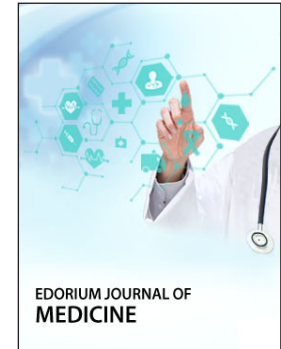
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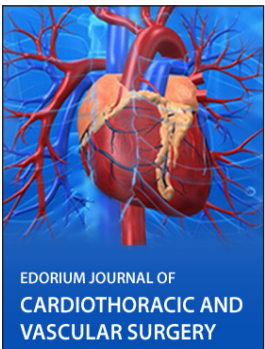
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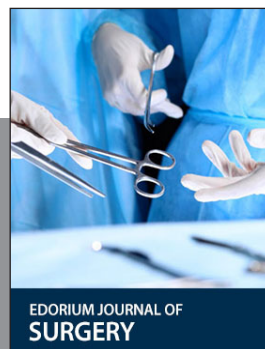
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