

Original Research Article

Management of Comminuted Distal Femur Fractures Using Locked Condylar Plates

Charif M¹, Antar A^{1*}, Aguenau O¹, Fekhaoui M.R¹, Mekkaoui M.J¹, Bouffetal M¹, Bassir R.A¹, Kharmaz M¹, Lamrani M.O¹

¹Department of Orthopedics and Traumatology, CHU Ibn Sina, Mohammed V University of Rabat

Article History

Received: 03.06.2025

Accepted: 21.07.2025

Published: 02.09.2025

Journal homepage:

<https://www.easpublisher.com>

Quick Response Code

Abstract: Comminuted fractures of the distal femur are a therapeutic challenge due to their anatomical complexity and frequent association with bone fragility, especially in elderly patients. The introduction of locked condylar plates has brought significant progress in the surgical management of these lesions. These plates offer superior angular stability, particularly useful in the presence of multiple fragments or osteoporosis. This retrospective study was conducted at the Ibn Sina University Hospital in Rabat, including 32 patients operated for comminuted distal femur fractures (AO/OTA types C2 and C3) between January 2018 and December 2023. All cases were treated using locked condylar plates, with early rehabilitation and a minimum follow-up of 12 months. Bone union was achieved on average at 14.6 weeks. The mean functional outcome (Knee Society Score) at 12 months was 82.7. Complications were rare: two cases of stiffness requiring arthrolysis, one case of superficial infection managed medically, and no cases of nonunion. These results confirm the efficacy and reliability of locked condylar plates in stabilizing complex comminuted fractures of the distal femur.

Keywords: Distal Femur Fracture, Comminution, Locking Plate, Osteosynthesis, Knee, Orthopedic Surgery.

Copyright © 2025 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Distal femur fractures are rare, representing approximately 0.4% of all fractures, but they are severe injuries affecting two main populations: young adults with high-energy trauma and elderly osteoporotic patients after falls [1]. When comminuted, these fractures are difficult to reduce anatomically and carry a higher risk of nonunion, joint stiffness, and malalignment.

Locked condylar plates represent a modern fixation solution. They provide angular stability through the fixed-angle screw-plate interface, allowing stable fixation even in fragile bone or highly fragmented fractures [2].

This study aims to evaluate the functional outcomes and complications of treating comminuted distal femur fractures with locked condylar plates.

MATERIALS AND METHODS

Study Design

A retrospective descriptive study conducted at the Orthopedic and Traumatology Department of Ibn Sina University Hospital, Rabat, from January 2018 to December 2023.

Inclusion Criteria

- Comminuted distal femur fractures (AO/OTA types C2-C3)
- Surgical treatment with locked condylar plates
- Clinical and radiological follow-up ≥ 12 months

Surgical Procedure

Lateral approach in the supine position. Articular reduction under fluoroscopy, followed by application of a locked condylar plate (LCP, Synthes® or equivalent). A bridge-plating technique was used for metaphyseal comminution.

Rehabilitation

Passive mobilization from postoperative day 2. Partial weight-bearing at 6 weeks, based on radiological healing.

Evaluation Criteria

- Radiological: union time, alignment.
- Clinical: Knee Society Score (KSS) at 12 months.
- Complications: nonunion, stiffness, infection, hardware failure.

RESULTS

- Total patients: 32 (20 men, 12 women)

- Mean age: 53.4 years (range: 21–82)
- Etiologies: road traffic accidents (65%), falls from height (25%), other (10%)
- Open fractures (Gustilo type I): 4 cases
- Mean union time: 14.6 weeks
- Functional results: mean KSS at 12 months = 82.7 (good to excellent in 75% of cases)

Complications:

- 2 cases of joint stiffness requiring arthrolysis
- 1 case of superficial infection managed conservatively
- No nonunion or implant failure

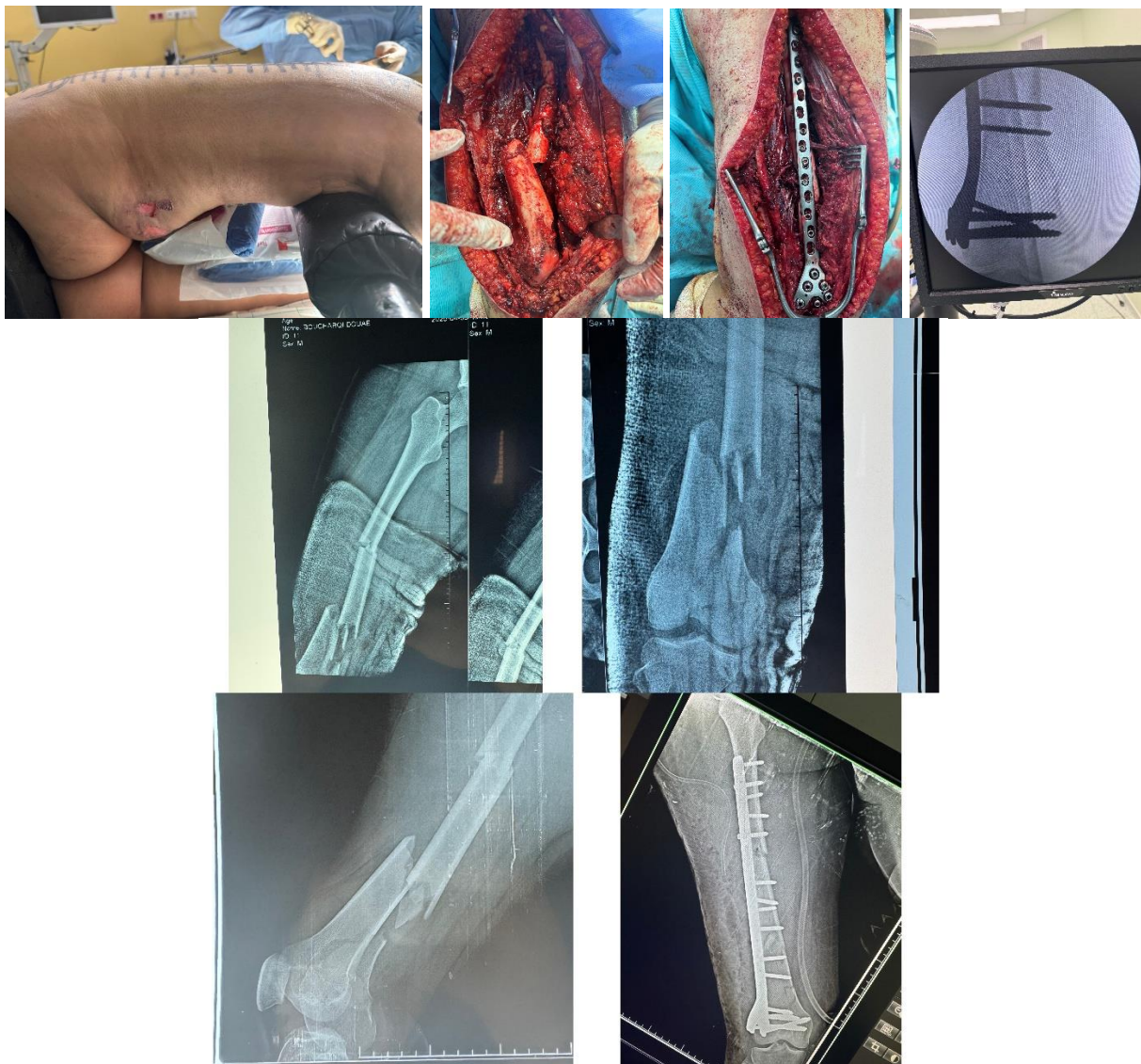


Figure 1.3: Surgical setup, exposure, and osteosynthesis of a distal femoral fracture

DISCUSSION

Locked condylar plating is now considered the gold standard for comminuted distal femur fractures due to its ability to provide stable fixation even in the absence of cortical bone contact [2]. Our findings are consistent

with literature data, showing reliable union and a low complication rate [1, 3].

Indirect reduction with bridge plating preserves local blood supply and promotes biological healing [4]. Nevertheless, joint stiffness remains a common

complication, emphasizing the need for early mobilization.

Implant selection must be adapted to the patient's bone quality and fracture pattern. Surgical expertise and a structured rehabilitation protocol are essential for optimal outcomes.

CONCLUSION

Locked condylar plates provide a safe and effective method for treating comminuted fractures of the distal femur. They offer stable fixation, promote timely union, and yield good functional results when proper surgical and postoperative principles are followed.

REFERENCES

1. Kolb K, Grün W, Koller H, et al. The condylar plate for the treatment of distal femoral fractures: a long-term follow-up study. *Injury*. 2009;40(4):440–448.
2. Hierholzer C, von Rüden C, Pötzel T, et al. Outcome analysis in patients with distal femur fractures treated with locking compression plates. *J Orthop Trauma*. 2011;25(5):312–317.
3. Ricci WM, Bellabarba C, Lewis R, et al. Angular stable fixation of distal femur fractures. *J Orthop Trauma*. 2004;18(8):562–566.
4. Henderson CE, Kuhl LL, Fitzpatrick DC, et al. Locking plates for distal femur fractures: is there a problem with fracture healing? *J Orthop Trauma*. 2011;25(Suppl 1): S8–S14.

Citation: Charif M, Antar A, Aguenou O, Fekhaoui M.R, Mekkaoui M.J, Bouffetal M, Bassir R.A, Kharmaz M, Lamrani M.O (2025). Management of Comminuted Distal Femur Fractures Using Locked Condylar Plates. *EAS J Orthop Physiother*, 7(5): 125-127.
