Dual Plate Fixation of Distal Femur Fractures Through a Novel Percutaneous Technique: A Case-Control Matched Analysis

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INTRODUCTION:
Surgical fixation of supracondylar distal femur fractures remains challenging, with nonunion rates reported up to 22%. Empowered constructs including dual plate techniques have emerged, though indications for their use and optimization of these techniques remains limited. The purpose of this study is to examine the use of a novel dual plating technique using percutaneously applied medial fixation.
METHODS:
Consecutive patients treated with a novel percutaneous dual plating technique at two academic tertiary care referral centers were case controlled in 1:3 fashion with a cohort of patients treated with single lateral locked plating from a 10-center database. Patients were matched based upon age, sex, smoking status, BMI, intraarticular extension, open fracture, and medial comminution. Association between potential predictors and unplanned reoperation to promote union were assessed using logistic regression analysis.
RESULTS:
Fifteen patients treated with a novel dual plating technique and minimum 3-month follow-up (range, 3 to 17 months) were compared to 45 patients treated with single lateral locked plates (Table 1). In the dual plate group, mean age was 58 years, with a mean length of medial comminution of 61 mm (range, 30 – 110 mm) and a mean lateral plate length of 13 holes (range, 6 to 20 holes). All patients treated with a dual plate technique utilized a 3.5 mm recon plate on the medial side, with an average plate length of 12 holes (range, 10 to 18 holes). There was a 0% reoperation rate to promote union in the dual plating group as compared to 11% in the single lateral locked plating group (p=0.318).
DISCUSSION AND CONCLUSION:
The use of a dual plate construct in the treatment of distal femur fractures utilizing a percutaneous technique is a safe and viable technique, with trends suggesting a possible decrease in reoperation to promote union. Further exploration into the use of this technique is warranted.

Variable	Lateral plate N = 45[†]	Dual plate N = 15[†]
Age (years)	56 (18)	56 (21)
Sex		
F	12 (27%)	5 (33%)
M	33 (73%)	10 (67%)
BMI (kg/m²)	28.0 (5.5)	28.1 (6.8)
Current smoker	5 (11%)	2 (13%)
Intra-articular extension	32 (71%)	12 (80%)
Open fracture	9 (20%)	3 (20%)
Comminution	36 (80%)	12 (80%)
Nonunion	5 (11%)	0 (0%)

[†] Mean (SD); n (%)