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Original Research

Management of distal femoral fracture with compression plating

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ABSTRACT:

Background: Distal femur fractures are often caused by high energy trauma mainly sustained in road traffic accidents and less commonly by fall from height. **Materials & Methods:** 70 patients with distal femur fractures of both genders were treated with compression plating. Parameters such as number of empty holes, bridge span length (mm), bone union rate and plate span ratio were recorded. **Results:** 33 A2 type was seen in 25, A3 in 20, 33C1 in 10, C2 in 8 and C3 in 7 patients. Males were 45 and females were 25. The mean number of empty holes was 2.1 and bridge span length was 81.4 mm. Union was seen in 62 and non- union in 8 cases. Plate span ratio >8-10 was seen in 1 and <8-10 in 2 cases. The difference was significant (P< 0.05). **Conclusion:** Compression plating in the management of distal femoral fracture found to be effective.

Key words: Bridge span length, Compression plating, Distal femur fractures

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INTRODUCTION

The incidence of distal femur fractures is approximately 37 per 1,00,000 person-years. Distal femoral fractures mainly arise from two different injury mechanisms.[1] They are often caused by high energy trauma mainly sustained in road traffic accidents and less commonly by fall from height.[2] Open injuries with considerable comminution of condyles and metaphysis are frequently seen.[3] In high-energy trauma, the problem of restoring the function in a destroyed knee joint persists. In elderly patients, extreme osteoporosis represents a particular problem for anchoring the implant.[4]

Surgical treatment can either be retrograde intramedullary nail fixation or be plate fixation, with plate fixation having a wide indication for various fractures types. Regarding plate fixation, basic fixation is generally recommended to achieve absolute stability using lag screws in simple fractures; however, lag screw fixation cannot be performed in transverse fractures. Moreover, it is impossible to achieve absolute stability with rigid internal fixation in comminuted fractures. In such cases, it is necessary to use a locking plate as a bridging plate to fix the fracture site.[5] Double plating, and more recently, locked plating techniques have been advocated. However, with double plating there is often extensive soft tissue stripping on both sides of the femur, resulting in reduced blood supply and potential non-union and failure of the implants.[6] The present study was conducted to assess outcome of distal femoral fracture managed with compression plating.

MATERIALS & METHODS

The present study comprised of 70 patients with distal femur fractures of both genders. All were informed and their written consent was obtained.

Data pertaining to patients such as name, age, gender etc. was recorded. An extensive examination of the site was performed. Routine blood examination was performed. AO/OTA fracture classification was followed. All were treated with compression plating. Parameters such as number of empty holes, bridge span length (mm), bone union rate and plate span ratio were recorded. Results thus obtained were analysed using appropriate tests. P value less than 0.05 was considered significant.

RESULTS

Table I Characteristics of patients

Variables	Parameters	Number	P value
AO/OTA fracture classification	33 A2	25	0.05
	A3	20	
	33C1	10	
	C2	8	
	C3	7	
Gender	Males	45	0.01
	Females	25	

Table I, graph I shows that 33 A2 type was seen in 25, A3 in 20, 33C1 in 10, C2 in 8 and C3 in 7 patients. Males were 45 and females were 25. The difference was significant (P< 0.05).

Graph I Characteristics of patients

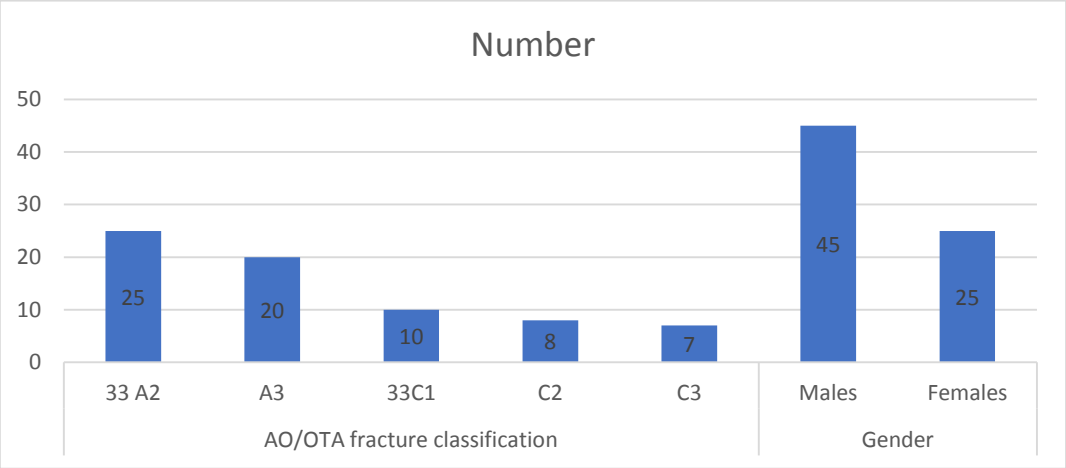
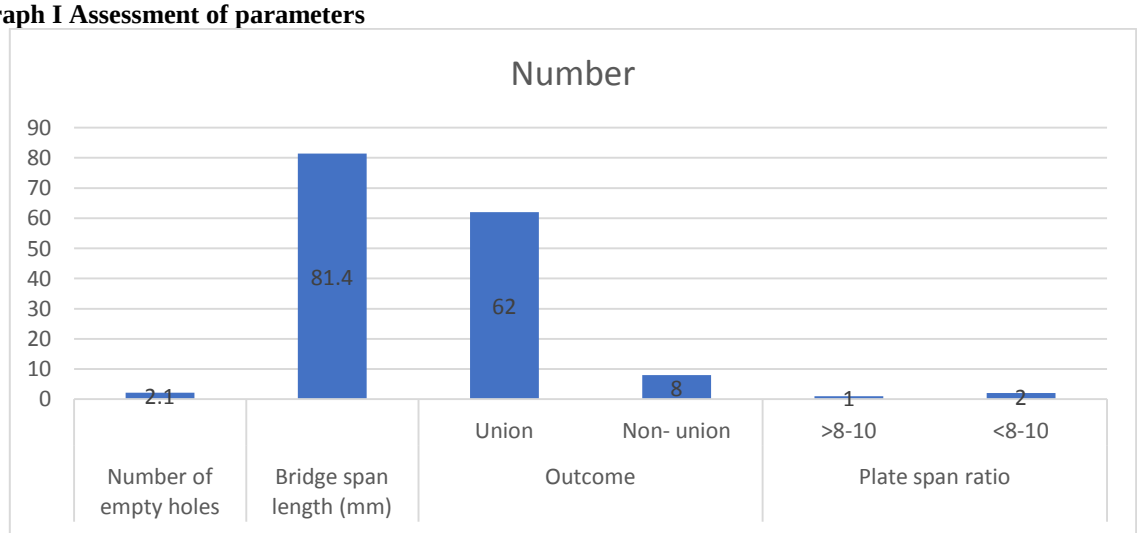


Table II Assessment of parameters

Variables	Parameters	Number	P value
Number of empty holes		2.1	-
Bridge span length (mm)		81.4	-
Outcome	Union	62	0.01
	Non- union	8	
Plate span ratio	>8-10	1	0.05
	<8-10	2	

Table II, graph II shows that mean number of empty holes was 2.1 and bridge span length was 81.4 mm. Union was seen in 62 and non- union in 8 cases. Plate span ratio >8-10 was seen in 1 and <8-10 in 2 cases. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Distal femur fractures need to be treated operatively to achieve optimal patient outcome. Distal femur fractures can be treated by traditional plating techniques (blade plate, Dynamic Condylar Screw, non-locking condylar buttress plate), antegrade nailing fixation, retrograde nailing, sub muscular locked internal fixation and external fixation.[7] However, as the complexity of fractures needing treatment has changed from simple extra- articular supracondylar types to inter-condylar and metaphyseal comminuted types, these implants may not be ideal.[8] The present study was conducted to assess outcome of distal femoral fracture managed with compression plating.

In present study, out of 70 patients, males were 45 and females were 25. 33 A2 type was seen in 25, A3 in 20, 33C1 in 10, C2 in 8 and C3 in 7 patients. Kammerlander et al[9] evaluated 43 distal femoral fractures in older people (mean aged 80.0 ± 9.3), observing a mean survival time of 434 days, and only 18% of them were able to walk without aids. Recently, Smith et al[10] evaluated a population of older people, reporting a mortality at 30 days at 6 months, and at 12 months, respectively of 7, 16, and 18%; only the 46% of the participants was able to walk independently. The Authors comparing these results with those of proximal femoral fractures, supported the hypothesis of a substantial similarity between these two populations; therefore, they suggested that it was more appropriate using the same pathway for both types of femoral fractures.

We found that mean number of empty holes was 2.1 and bridge span length was 81.4 mm. Union was seen in 62 and non- union in 8 cases. Plate span ratio >8-10 was seen in 1 and <8-10 in 2 cases. Toro et al[11] included people aged more than 65 years, with a diagnosis of distal femoral fracture, treated with locking plates. They considered 'unsuccessfully treated' the cases with healing problems or hardware failures. Of the 12 patients (9 females and 3 males; mean aged 68.75 ± 3.31 years) included, we observed 3 'unsuccessfully cases', 2 due to non-unions and 1 due to an early hardware failure, all treated using a condylar blade plate with a bone graft. One patient obtained a complete fracture healing after 1 year and in the other cases there was a non-union. They observed as most common technical pitfalls: inadequate plate lengthening, fracture bridging, and number of locking screws. The use of locking plates is an emerging technique to treat these fractures but it seems more challenging than expected. In literature there is a lack of evidences about the surgical management of distal femoral fractures that is still an important challenge for the orthopaedic surgeon that has to be able to use all the fixation devices available.

In a study by Schutz M, Muller M et al[12], internal fixation using the LISS was performed at an average of 5 days (range: 0-29 days) after the injury. 48 fractures were operated on within the first 24 hours. Revision operations were required for 2 cases of implant breakage. 4 cases of implant loosening and 7 debridement's to deal with infections. The study showed clearly that when working with LISS, primary cancellous bone grafting was not necessary. The total follow-up rate was 93%. Non- union was observed in 5% cases.

CONCLUSION

Authors found that compression plating in the management of distal femoral fracture found to be effective.

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