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Title: Short-Term Outcomes of Miniplate-Based Fracture Fixation for Comminuted Patellar Fracture: A Case Series Study

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Disclosures: None



Introduction

- Prevalence rate of patellar fracture : 1%
- **No gold standard** for treating comminuted patellar fracture
 - Tension band wiring
 - Cerclage wiring
 - Screw fixation
 - Locked plating
 - Patellectomy
 - A combination of above



Introduction

- We have developed a novel surgical technique using locking compression miniplates in a combination of long locking screws or cannulated screws in treatment of multifragmentary, comminuted patellar fracture
- Aim of the study
 - **To evaluate the effectiveness of internal fixation with miniplates in comminuted patellar fractures, as measured by radiographic and functional outcomes.**



Methods

- Patient selection
 - Retrospective review of medical and radiologic records
 - From June 2018 to November 2021
 - Average follow-up of 15 months
 - AO/OTA 43-C3 multi-fragmentary patellar fracture
- Clinical and radiologic evaluation
 - Postoperative follow-up interval : 1,3,6,12, and the last follow-up
 - Primary outcomes : osseous union
 - Secondary outcomes : functional score (Lysholm score), knee range of motion (ROM), and complications



Methods

- Surgical Protocol



Methods

- Surgical Protocol



Methods

- Surgical Protocol



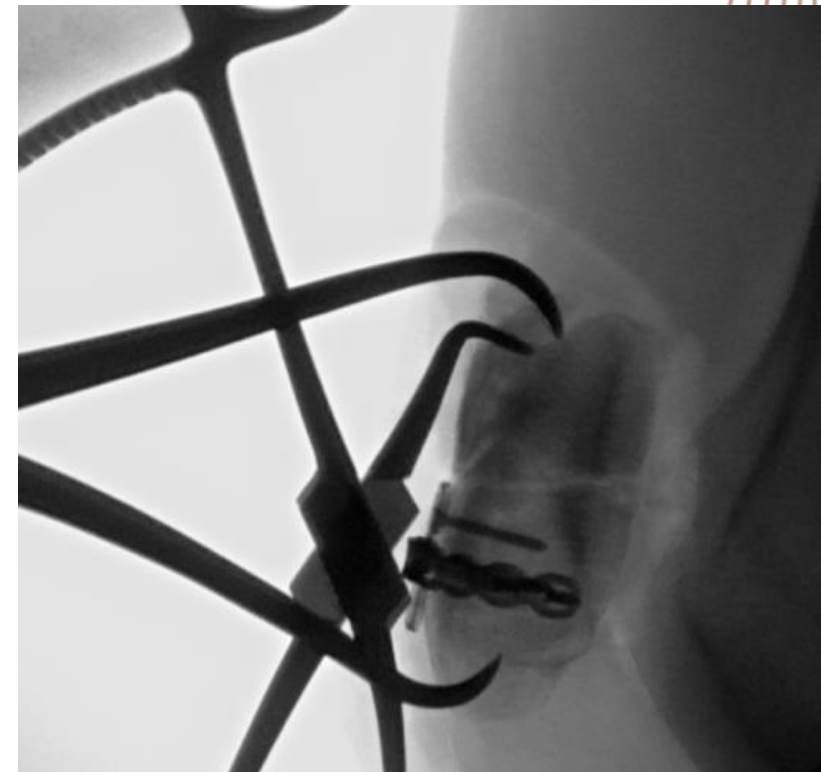
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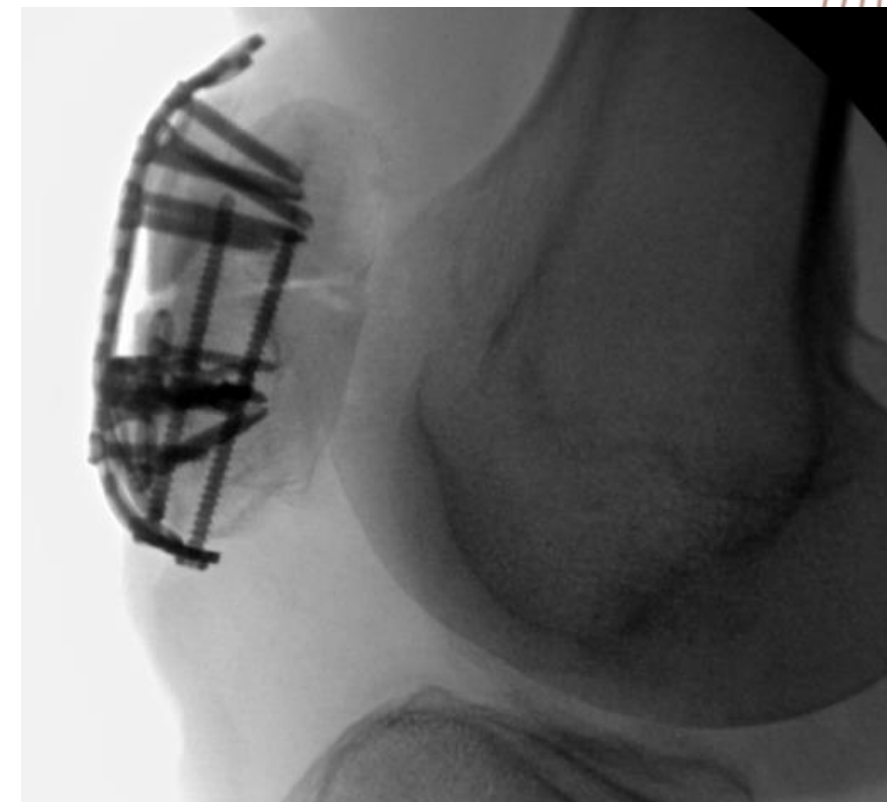
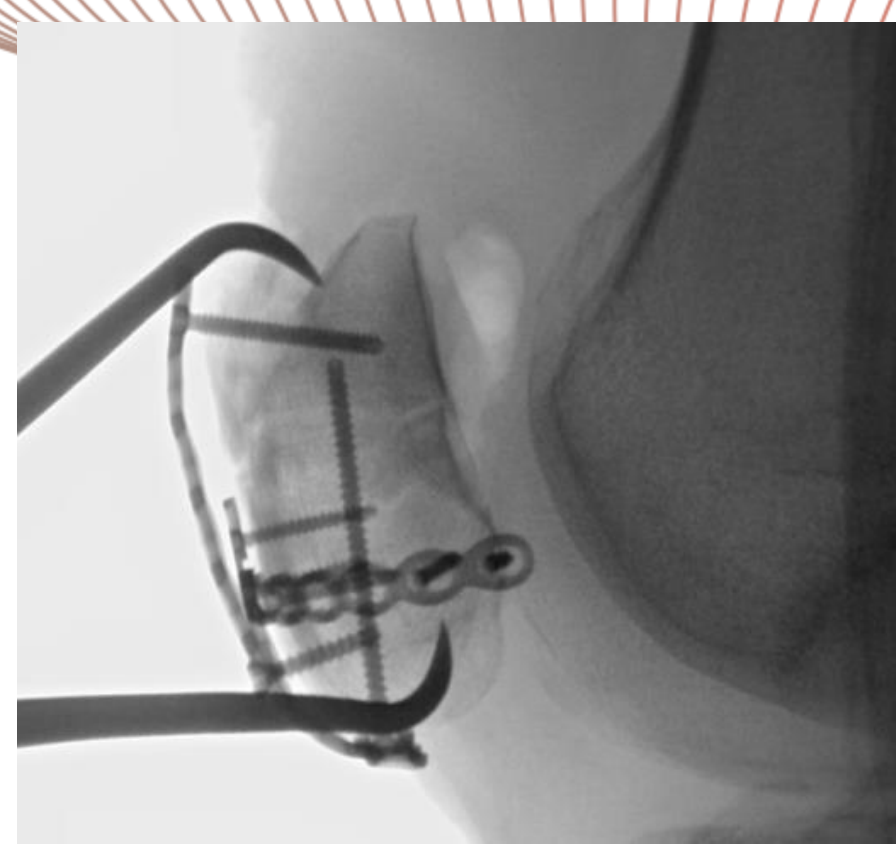
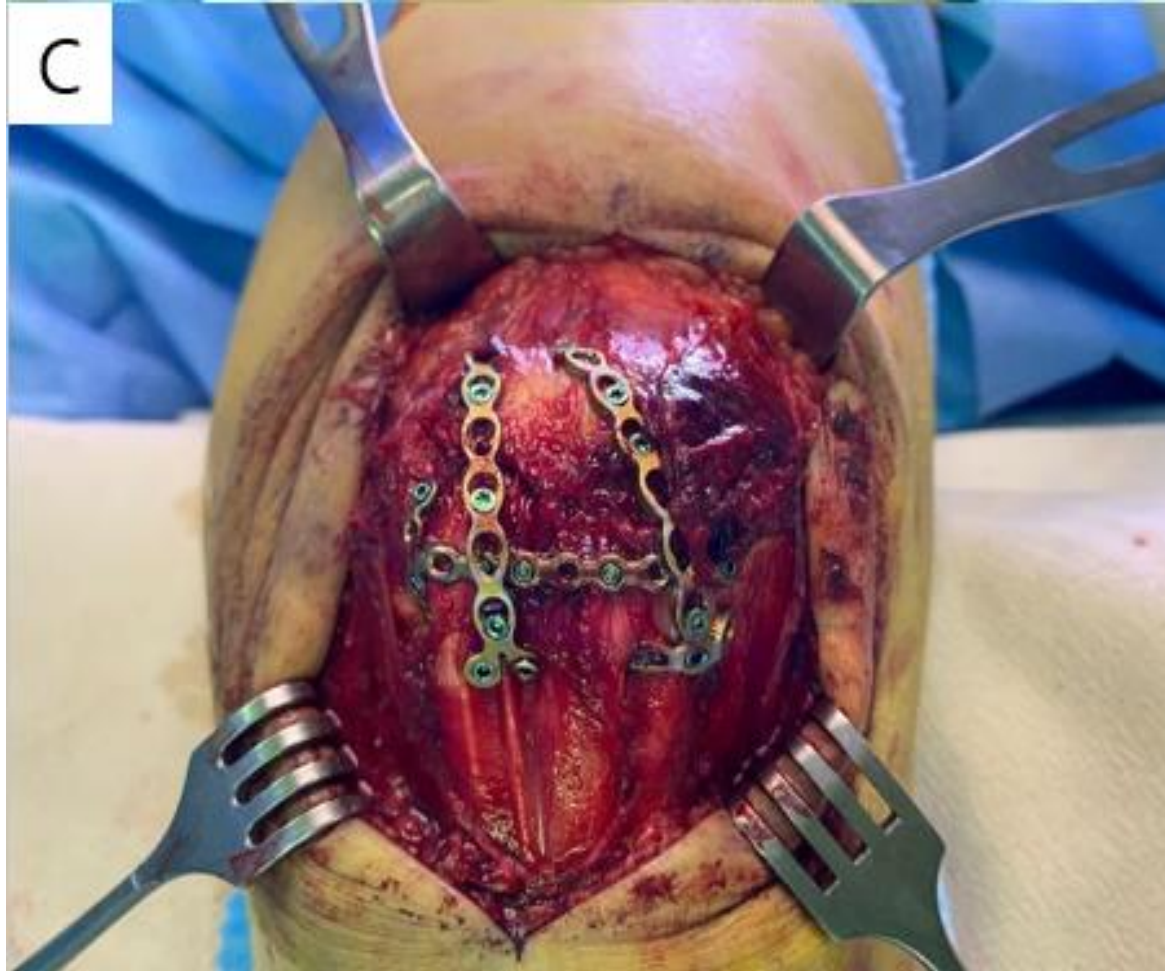
Methods

- Surgical Protocol



Methods

- Surgical Protocol



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Methods

- Postoperative rehabilitation
 - ~POD#2 : cylinder splint with full extension of knee
 - POD#2~ : cylinder cast with full weight-bearing
 - POD#2w~4w : hinged knee brace (knee ROM 30' → 90')
 - ~POD#6w : knee ROM 130'



Results

Table 1. Characteristics of Patients and Patellar Fractures

		20 patients
Patients		
	Age	57.7 (28~82)
	Sex	
	Male	10 (50%)
	Female	10 (50%)
Fracture Pattern (%)	AO-OTA 34-C3	20 (100%)
Number of fragments (range)		4.7 (4~7)
Open Fracture (%)		1 (5%)
Fixation methods		
	Average number of miniplates per case	2.8 (2~5)
	Number of wiring (%)	5 (25%)
	Number of cerclage wiring (%)	2 (10%)
Mode of injury (%)		
	Slip down	14 (70%)
	Fall	1 (5%)
	Traffic accidents	5 (25%)
Underlying diseases (%)		
	Osteoporosis	3 (15%)
	Diabetes mellitus	5 (25%)
	Smoking	5(25%)

Table 2. Radiologic and Clinical Outcomes

		20 patients
Primary union rates (%)		20 (100%)
Union times (weeks)		15.6
Operation times (minutes)		98 (59~139)
Complications (%)		
	Malunion	0 (0%)
	Fixation failure	0 (0%)
	Postoperative infection	0 (0%)
Additional surgery (%)		
	Revision surgery (%)	0 (0%)
	Implant removal (%)	7 (35%)
Average final range of motion		120 (100~135)
Incidence of extension lag		0 (0%)
Average Lysholm scores		
	Postoperative 1 month	44.3 (20~52)
	Postoperative 3 month	58.5 (28~74)
	Postoperative 6 month	89.1 (58~100)
	Postoperative 12 month	90.4 (68~100)
	Last follow up	92.1 (72~100)
Average Tegner scores		
	Postoperative 1 month	0.8 (0~2)
	Postoperative 3 month	1.9 (1~3)
	Postoperative 6 month	3.6 (2~6)
	Postoperative 12 month	4.3 (2~7)
	Last follow up	5.0 (3~9)

Discussion/Conclusion

- Osteosynthesis of patella fracture with miniplates can provide **sufficient mechanical stability for early ROM without postoperative complications** such as nonunion, fixation failure, symptomatic implants.
- Advantages of miniplate technique
 - Wide availability of miniplates
 - Ease of anatomical reduction in full extension position
 - Low profile construct
 - Versatility in multiplanar application



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