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 33.1 (17~62) , 가13 가
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1914 Burghard²⁾가
1940 Kuntscher⁹⁾가
. Magerl¹²⁾
, interlocking Ender PGP
Schneider¹⁸⁾ Schazker Tile^{16,17)}
, slot tip 가 가
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Mears¹³⁾
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Herbert Gerald⁸⁾
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Table 1. Analysis of cases with metal failure in mid-shaft femur fractures

No.	Age	Sex	Cause	Type	Implant	Associate injury	Interval (months)	Extrinsic cause	Failure site	Treatment	Complication
1.	17	M	Incar TA*	Simple	DCP [†]		6	Unknown	Fx. site	Interlocking IM nail+BG	
3.	41	M	Motorcycle TA*	Comm. [†]	LC-DCP [§] +open	Tibia Fx.	12	Exercise	Fx. Site	Interlocking IM nail	
4.	27	M	Incar TA*	Simple	IM nail		26	Slip down nail+BG	Fx. Site	Interlocking IM	
5.	22	M	Motorcycle TA*	Comm. [†]	IM nail		30	Unknown	Screw	Interlocking IM nail	shortening
6.	31	M	Motorcycle TA*	Comm. [†] +open	IM nail	Pelvic bone, radioulnar Fx.	32	Exercise	Fx. Site	Interlocking IM nail	
7.	46	M	Motorcycle TA*	Simple	DCP [†]	Pelvic bone, femur neck, ankle Fx.	8	PT [¶]	Fx. Site	LC-DCP [§] +DCP [†] +BG	
8.	27	M	Outcar TA*	Simple	IM nail		10	Unknown	Prox. Area of Fx.	Interlocking IM nail	
9.	19	M	Motorcycle TA*	Simple	IM nail	Tibia Fx.	4	Unknown	Fx. Site	Interlocking IM nail+BG	Re-failure
10.	62	M	Outcar TA*	Comm. [†]	DCP [†]		5	PT [¶]	Fx. Site	Interlocking IM nail	infection
11.	35	M	Fall down	Comm. [†] +open	IM nail	Patella Fx.	15	Unknown	Fx. Site	Interlocking IM nail+BG	
12.	24	M	Outcar TA*	Simple+open	DCP [†] +BG		15	Unknown	Fx. Site	External fixator	shortening
13.	40	M	Incar TA*	Simple	LC-DCP [§] +BG	Tibiofibula, patella Fx.	7	Unknown	Fx. Site	Interlocking IM nail+BG	infection
14.	22	M	Motorcycle TA*	Simple	DCP [†]	Tibia, ankle Fx.	36	Exercise	Fx. Site	Interlocking IM nail+BG	
15.	35	F	Incar TA*	Simple	IM nail		3	Unknown	Screw	LC-DCP [§] +BG	
16.	27	M	Motorcycle TA*	Comm. [†]	DCP [†]	Radius Fx.	11	Unknown	Fx. Site	External fixator	
17.	42	M	Motorcycle TA*	Comm. [†]	IM nail	Tibia, patella Fx.	27	Exercise	Fx. Site	Interlocking IM nail+BG	Knee ankylosis

TA* : traffic accident / Comm.[†] : comminuted / DCP[†] : dynamic compression plateLC-DCP[§] : low contact dynamic compression plate / BG : bone graft / PT[¶] : physical therapy

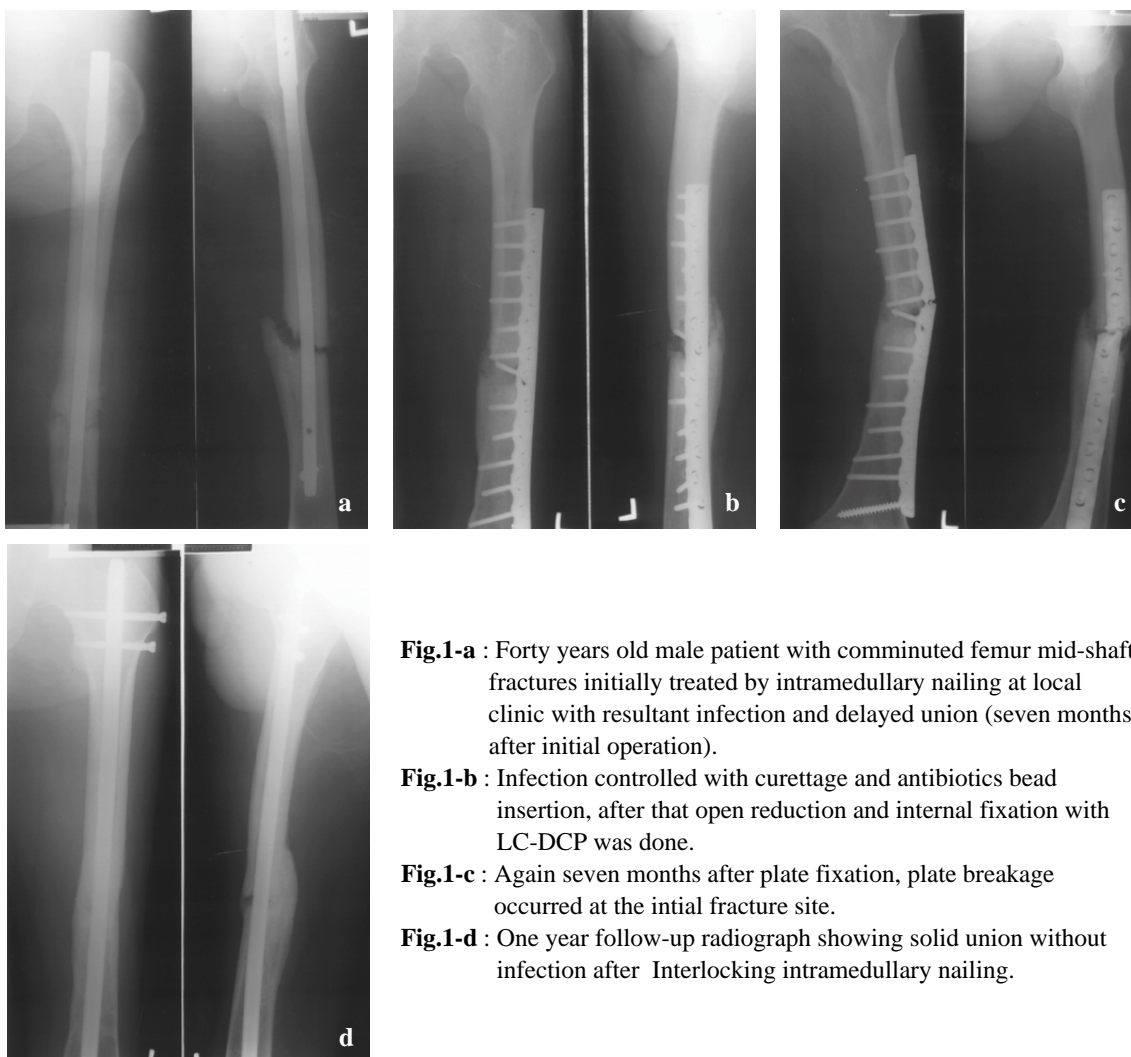


Fig.1-a : Forty years old male patient with comminuted femur mid-shaft fractures initially treated by intramedullary nailing at local clinic with resultant infection and delayed union (seven months after initial operation).

Fig.1-b : Infection controlled with curettage and antibiotics bead insertion, after that open reduction and internal fixation with LC-DCP was done.

Fig.1-c : Again seven months after plate fixation, plate breakage occurred at the initial fracture site.

Fig.1-d : One year follow-up radiograph showing solid union without infection after Interlocking intramedullary nailing.

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Abstract

Metal Failure after Internal Fixation in the Treatment of Femur Mid-shaft Fractures

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Purpose : To evaluate the causative factors of metal failure after internal fixation, and to suggest more rational treatment guideline that can prevent metal failure in the mid-shaft femur fractures.

Materials and Methods : A retrospective review of 17 cases, who were treated with internal fixation for the femur mid-shaft fracture was analyzed. We evaluated the cause of injury, fracture type and site, associated injury, used instruments, duration to metal failure, and complications.

Results : The metal failure occurred on average 14.8 months after internal fixation. As extrinsic factors, early exercise and weight-bearing in 7 cases, slip down during ambulation in 4 cases, improper physical therapy in 3 cases and unknown cause in 3 cases were related to metal failure. Most metal failure were occurred at the initial fracture site in 12 cases. Other metal failure site were empty holes in 1 case and proximal area of fracture site in 1 case, and screw breakage in 3 cases.

Conclusion : Accurate preoperative evaluation of fracture site, fracture type and proper selection of instrument, and precise surgical technique will be essential for the prevention of metal failure.

Key words : Femur mid-shaft fracture, Internal fixation, Metal failure

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