SMALL WIRE EXTERNAL FIXATION FOR THE TREATMENT OF THE DISTAL TIBIAL FRACTURES-MID TERM RESULTS AND COMPLICATIONS

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CHALLENGE 1

FRACTURE SEVERITY

CHALLENGE 2

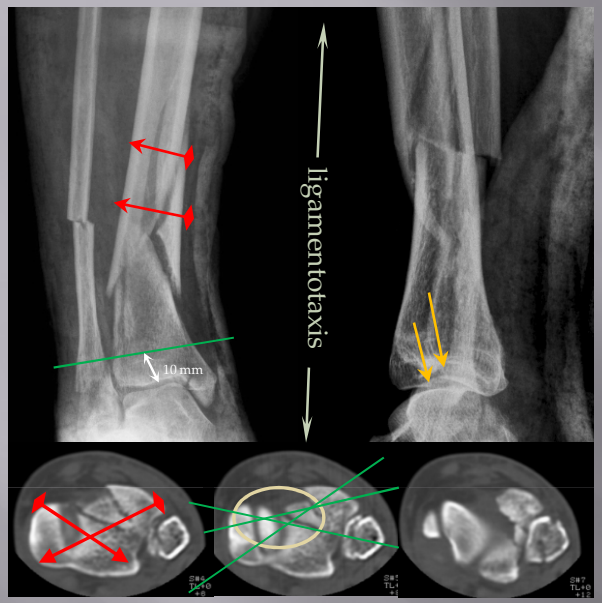
SOFT TISSUE DAMAGE

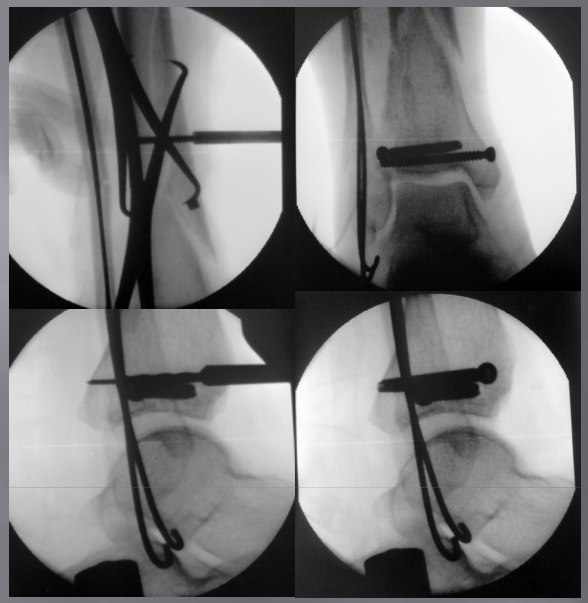
SOLUTION ?

OBJECTIVE

TO EVALUATE PROSPECTIVELY THE EFFECTIVENESS OF CIRCULAR WIRE EXTERNAL FIXATION IN THE TREATMENT OF TIBIAL PILON FRACTURES.

METHOD





1.Pre operative planning

-orthogonal X-rays, CAT
-localization of depression
-reposition sequence
-screw level and direction
-K wire level and direction
-frame construction

2.Articular reposition

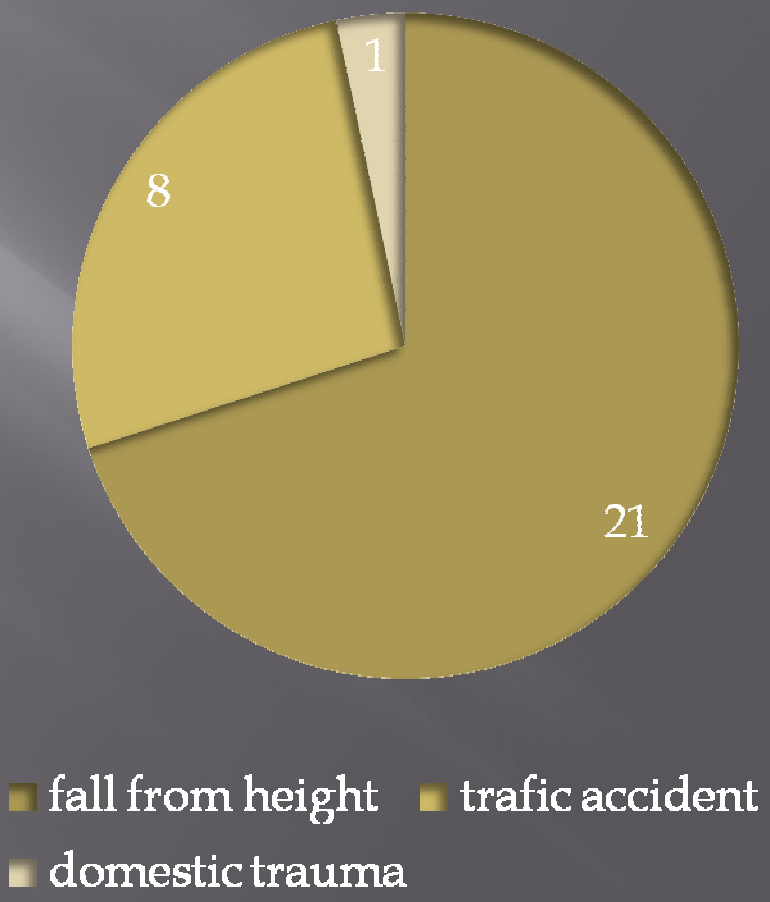
-traction table
-K wires for the fibula
-percutaneous , limited open or arthrosopic manipulation of the articular fragments
-cannulated screw fixation

3.Frame application

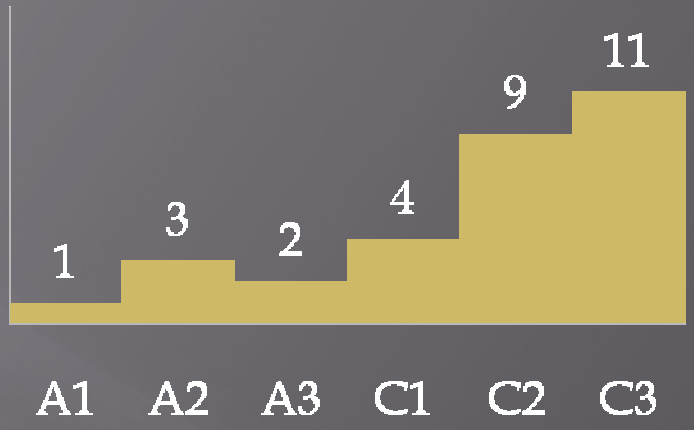
-3-4 K wires, 10mm above the joint line
-5mm bone screws in divergent planes in the cortical bone
-3 K wires proximally

MATERIAL

- 30 distal tibial fractures
- 22 men and 6 women
- Mean age 48,85 years (range 23-76)
- 96% high energy fractures

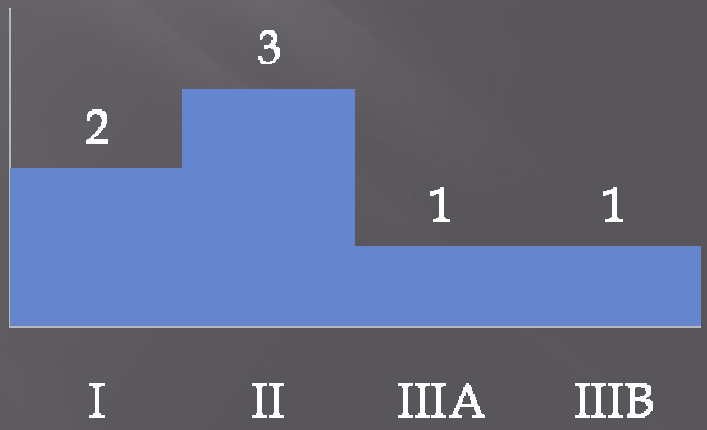


- AO/ASIF type A-6,type C-24



- 17 fractures
with soft tissue damage
(Tscherne-Gotzen classification)

- 7 open fractures
(Gustilo-Anderson classification)

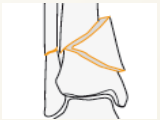


RESULTS

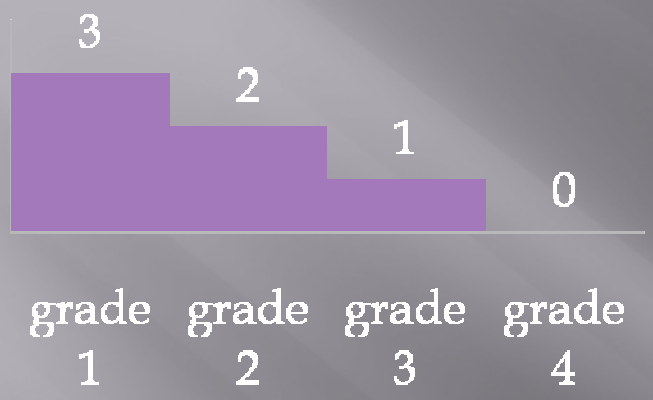
AOFAS (American Orthopeadic Foot and Ankle Society) max 100 points for objective and functional evaluation

TOTAL	RESULT
>90%	Excellent- no pain, normal gait, normal ROM, no swelling
80-89%	Good-minimal pain, normal gait, ¾ ROM, moderate swelling
70-79%	Satisfactory- pain on load bearing, limping gait,1/2ROM, moderate swelling
<70%	Poor-pain at rest, walking aid needed, 1/2ROM, pronounced swelling

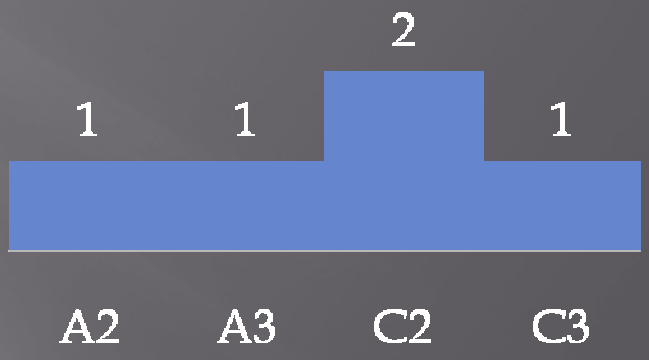
Results and complications

Fracture type	Number of fractures	Rating		Complications	
A1 	1	Excellent- Good-	0 1		
A2 	3	Excellent -	3	Delayed union - Pin track infection-	1 1
A3 	2	Excellent - Good -	0 1	Delayed union- Pin track infection-	1 1
B1  B2  B3 	0	0		0	
C1 	4	Excellent - Good - Satisfactory-	2 1 1		
C2 	9	Excellent - Good -	4 5	Delayed union Malposition Pin track infection	2 1 1
C3 	11	Excellent - Good - Satisfactory - Poor-	4 5 1 1	Delayed union Malposition Arthrodesis- DVT- Pin track infection	1 1 1 1 3

COMPLICATIONS



Pin track infections*-6



Delayed union (>6 months) -5

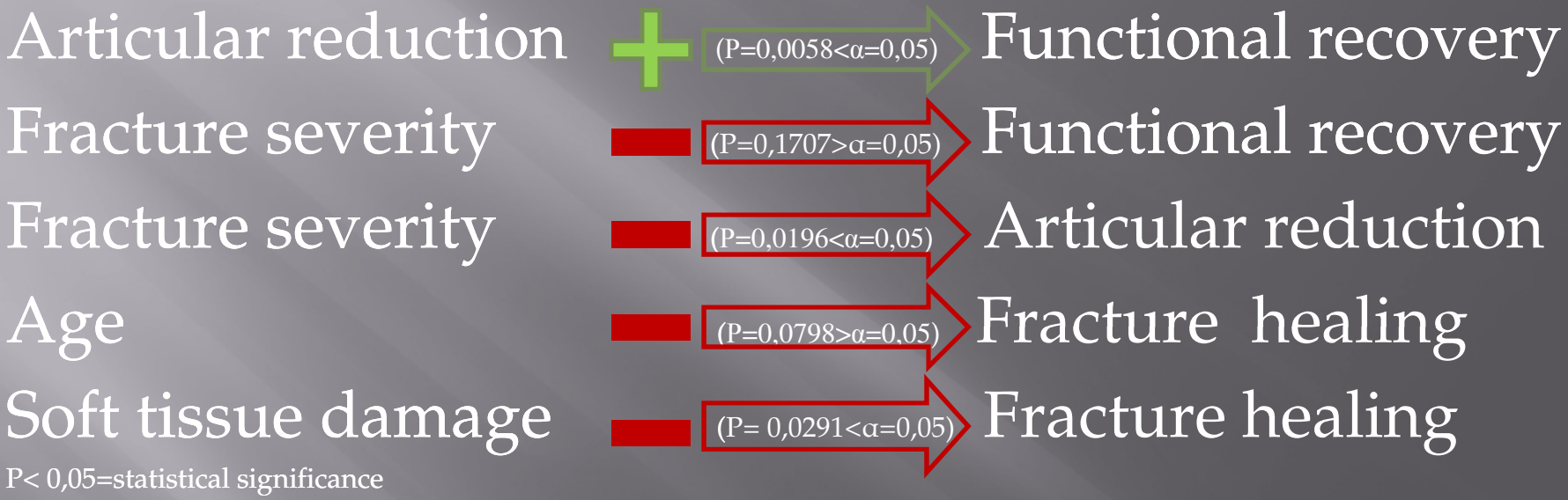
*Checketts RG, Otterburn M, MacEachern AG. Pin track infection: defnition, incidence and prevention. Int J Orthop Trauma 1993. 3: 16-18

Malunion- 2
AO type C3 mLDTA 100°
AO type C2 mLTDA 95°

Arthrodesis- 1
AO type C3

Deep infections - 0 Skin necrosis - 0 Septic arthritis - 0

CORRELATIONS



P< 0,05=statistical significance

Younger patients with simpler fracture patterns and less soft tissue damage tended to have better results and shorter healing times

CONCLUSIONS

- Soft tissue damage is as important for the final outcome as the bone damage
- A strategy to reduce iatrogenic soft tissue damage leads to favorable (86% good and excellent) functional results
- Articular reduction is important for the final outcome
- There is a marked tendency for delayed healing of fractures with meta-diaphyseal extension (types A and C2)

DISCUSSION

- Low invasive method
- Low complication rate
- Early movement
- Early weight bearing
- Faster functional recovery

- Demanding articular reposition
- Increased risk for neuro-vascular damage
- Pin track infections
- Patient compliance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