

Fractures Distales de Jambe Fixation par clou centromedullaire + TMSS



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Clinical results of tibia distal fractures
TargonTX
& trans medullar support screws TMSS



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Interlocking Nailing Course for Surgeons February 25 – 26, 2013 · Berlin / Germany



Metaphyseal Fracture Treatment with TMS Screws

H. W. STEDTFELD

Nuremberg / Germany



Poller Screws

Krettek C, Schandelmaier P, Tscherne H (1997)

[New developments in stabilization of dia- and metaphyseal fractures of long tubular bones]

Orthopaede 26(5): 408 - 21

Objectives: To downsize the medullary cavity by 'Poller Screws'
To guide the nail through the fragments.

'Poller Screws'

Seligson D (2000)

J Orthop Trauma Aug;14(6):454

What does 'Poller' mean?

Is it a name of an important German surgeon?

Is it a town in Germany?



German word for a traffic regulation tool which blocks the forbidden passage of cars

Transmedullary Support Screws

Stedtfeld HW, Mittlmeier T, Landgraf P, Ewert A (2004)

The Logic and Clinical Applications of Blocking Screws.

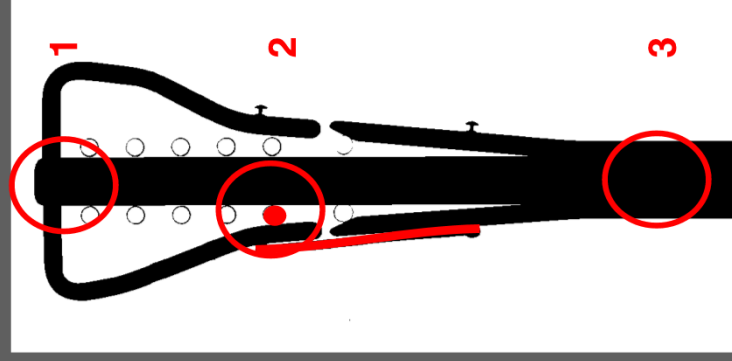
J Bone Joint Surg 86-A (Suppl 2): 17 – 25

Intramedullary 3-point construct to neutralize the forces coming from soft tissue imbalances.
Support of the short fragment on the wall of the nail.

Three points: entry point	isthmus	isthmus
BS	BS	BS
isthmus	distal nail anchorage	2nd BS ‘

Trans-medullary support screw’

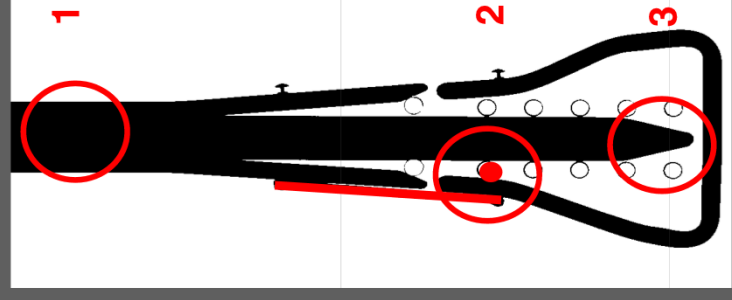
Educational Model



TMS screws in
correct position



exact reduction
&
stable axial
3-point fixation
(tension band construct)



Algorithm of placement: 1. Short fragment - 2. Close to the fracture
3. Concave side of the deformity

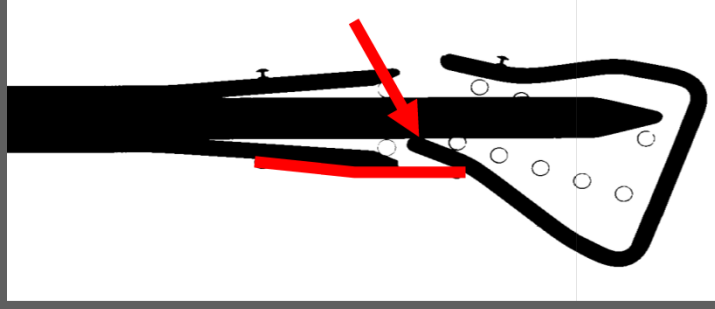
Educational Model

No reduction



Soft tissue
imbalance

Severe malalignment !



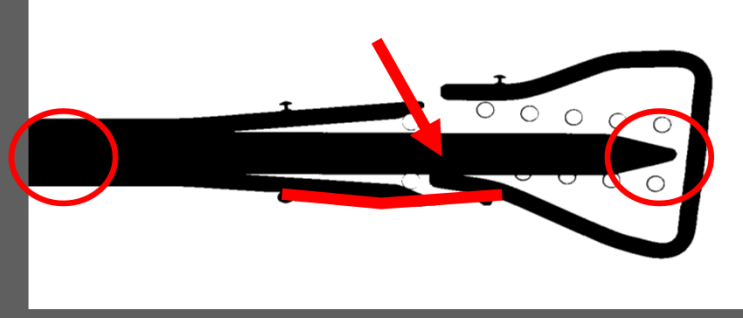
Note the cortical
point of support on
the wall of the nail

Educational Model

Reduction - but
2-point fixation only

↓
Soft tissue
imbalance

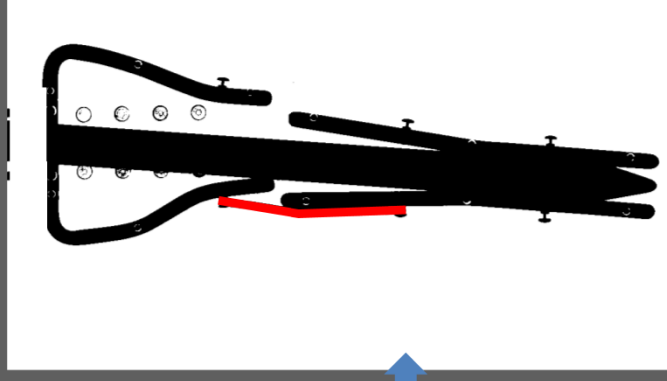
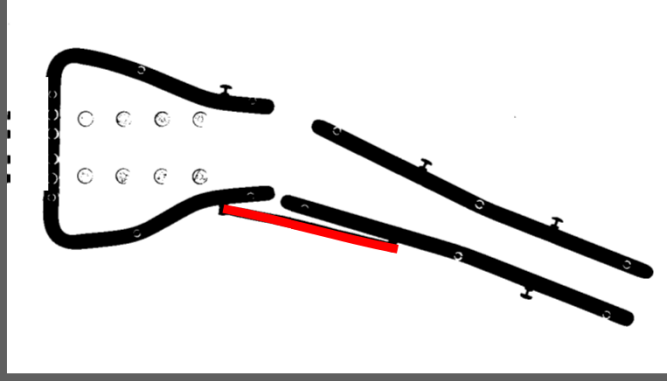
Malalignment



Note the cortical
point of support on
the wall of the nail

Educational Model

Nail alone
is unsuitable
for
closed reduction
and fixation of
short prox. or dist.
fragments

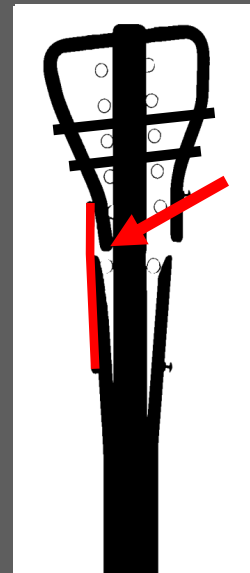


Educational Model

Interlocking Nailing

If interlocking is done
in reduced fracture position,
amount of secondary displacement
depends on

- screw strength
- screw angulation within nail



**Note the cortical
point of support on
the wall of the nail**

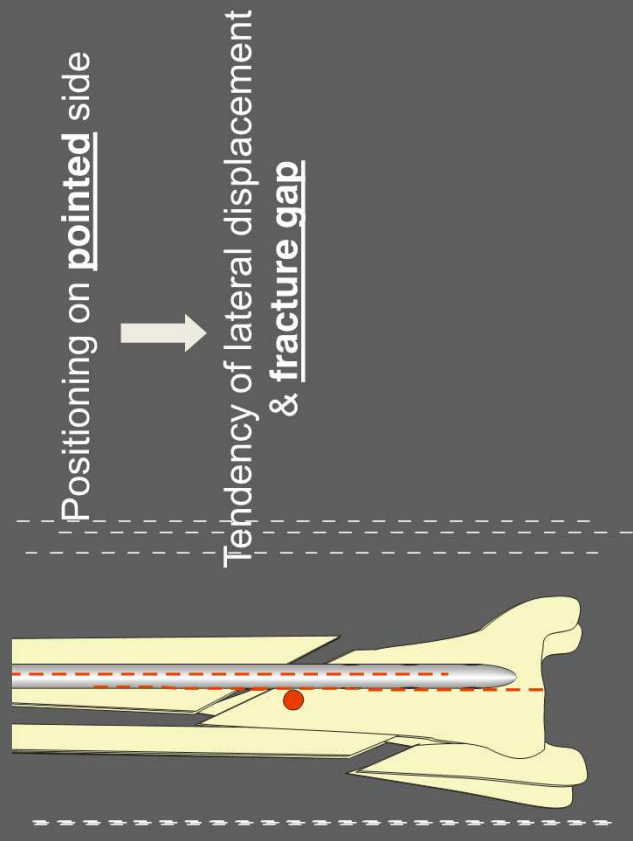
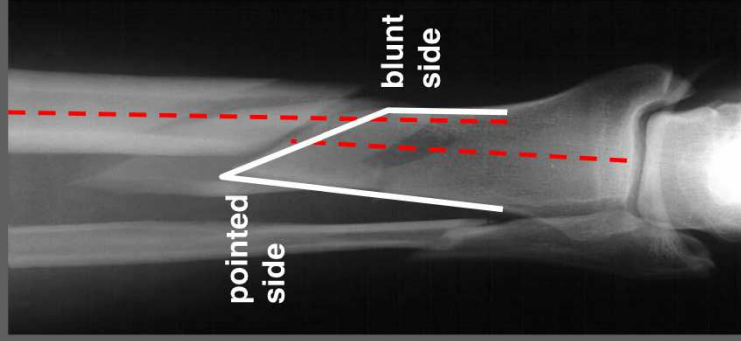
Clinical Application



- Algorithm of placement:
1. Short fragment
 2. Close to the fracture
 3. Concave side of the deformity

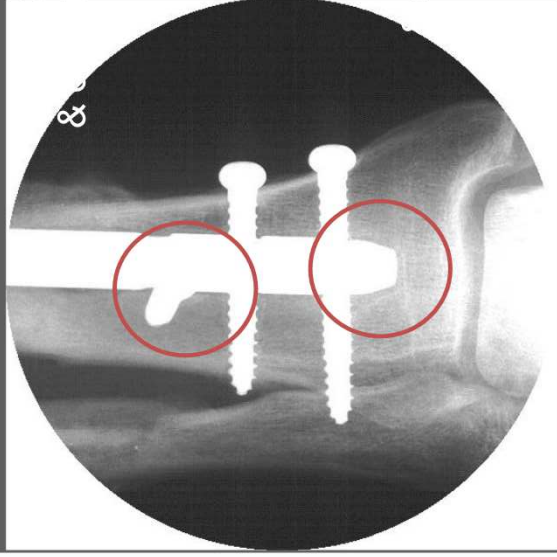
The Case of Oblique or Spiral Fractures

3. Concave side of the deformity ?

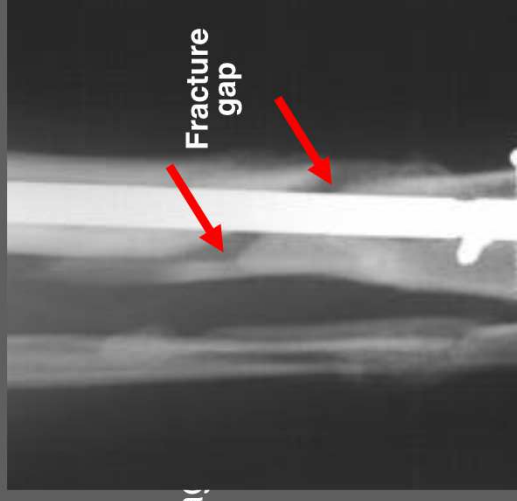


Clinical Application: Distal Tibia

Screw close to fracture
& concave (pointed) side

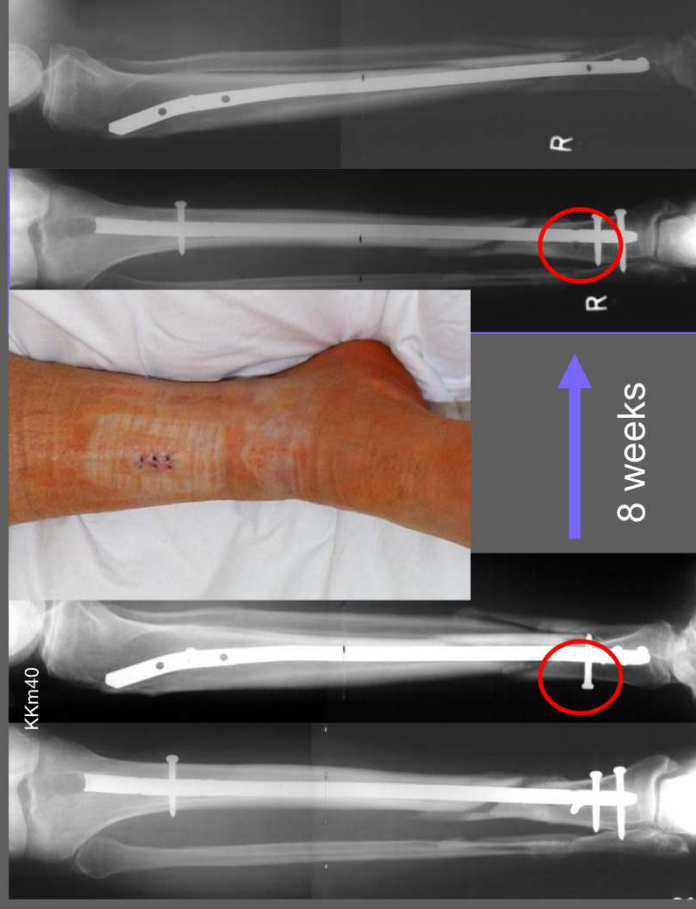


distal nail anchorage

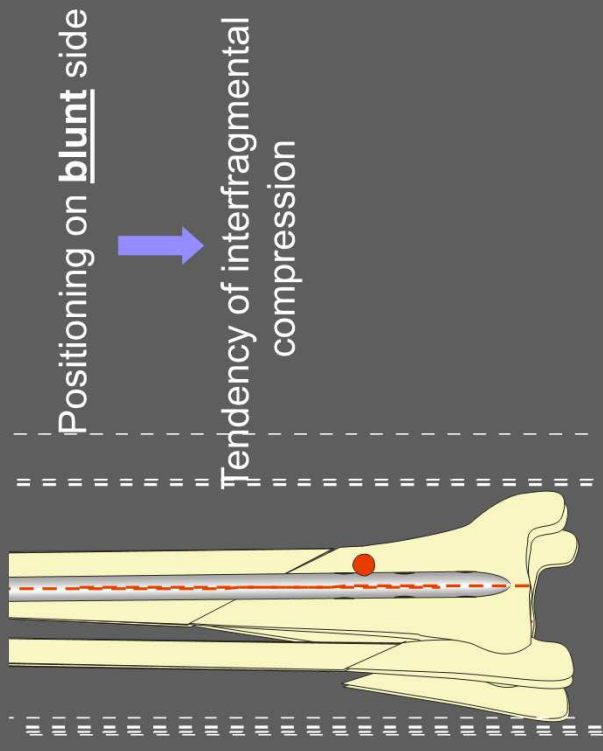
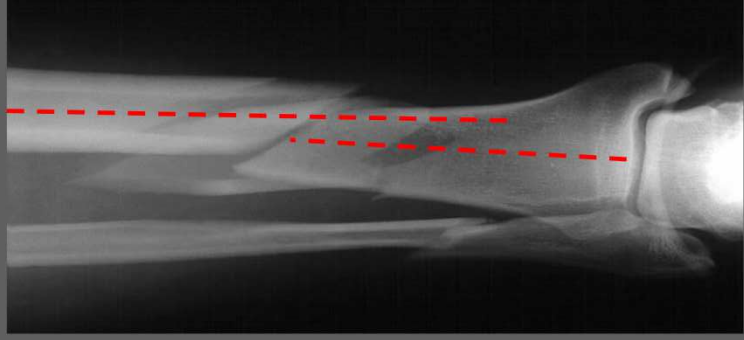


Good axial alignment
but fracture gap!

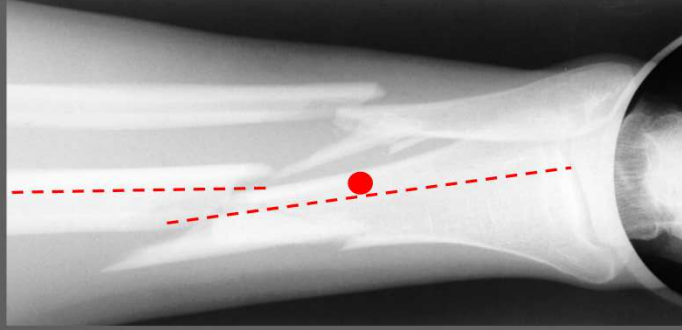
Clinical Application: Distal Tibia



The Case of Oblique or Spiral Fractures



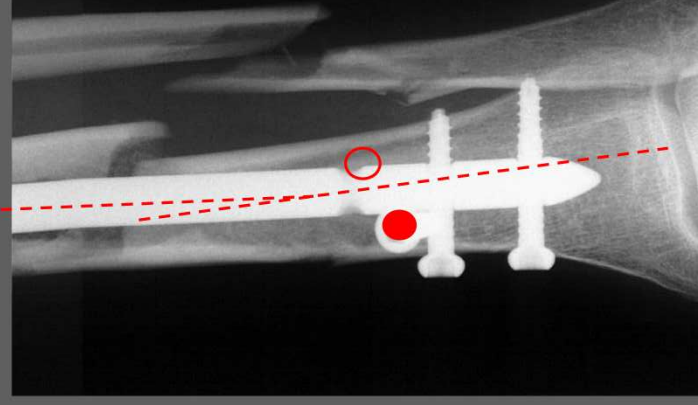
Clinical Application: Distal Tibia



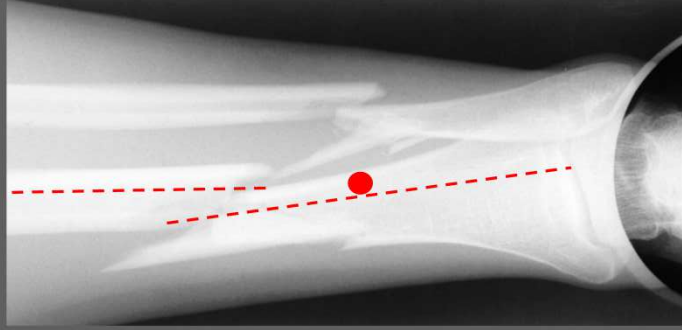
wrong side!



valgus
malposition



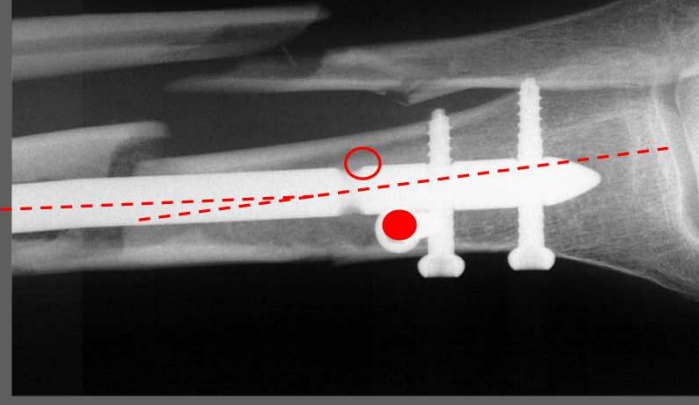
Clinical Application: Distal Tibia



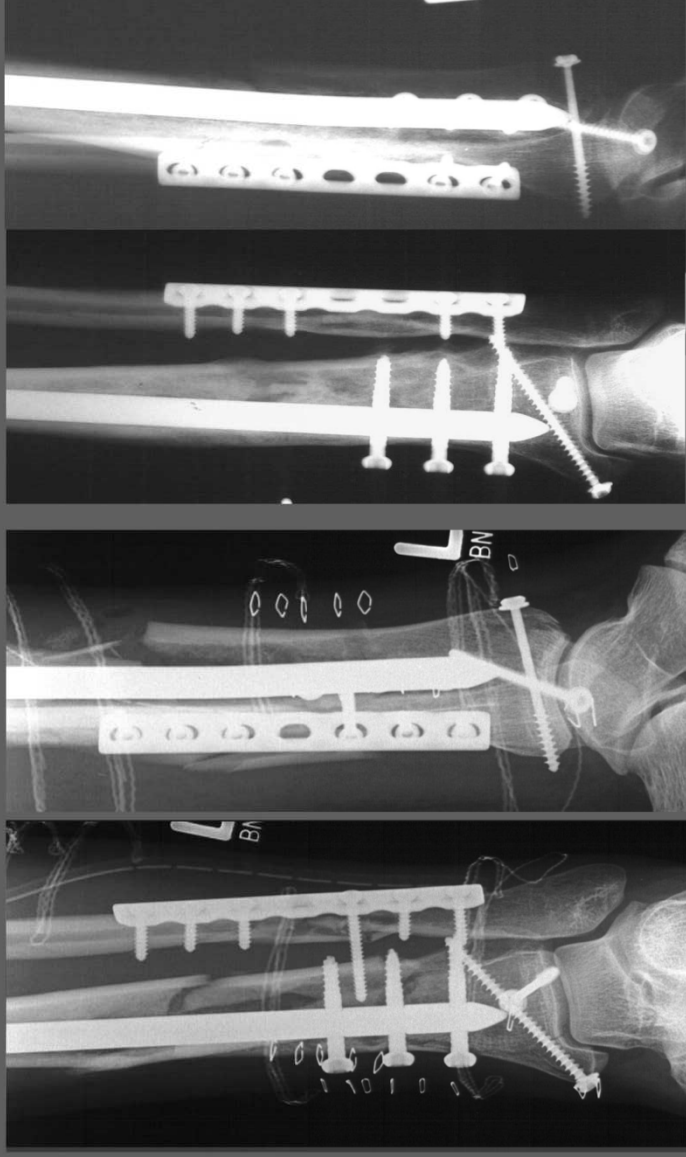
wrong side!



valgus
malposition



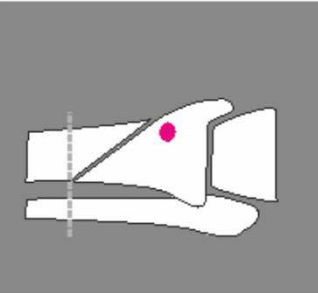
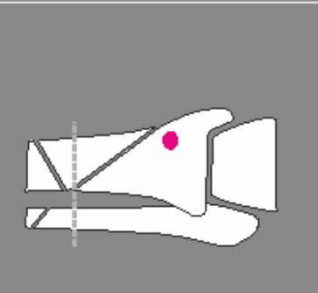
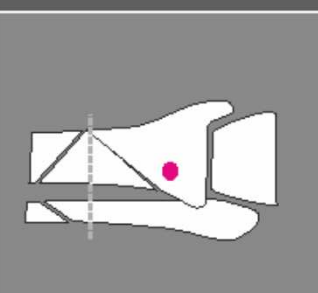
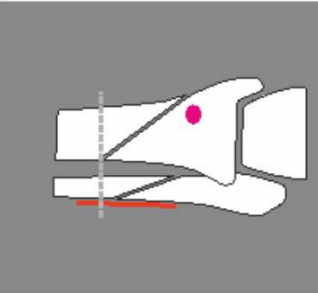
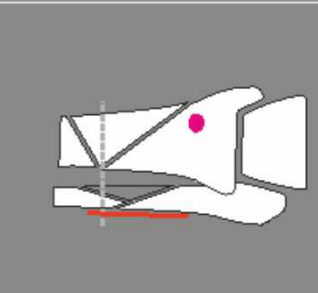
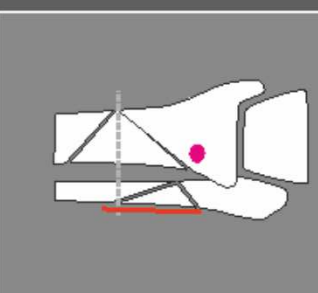
Clinical Application: Distal Tibia



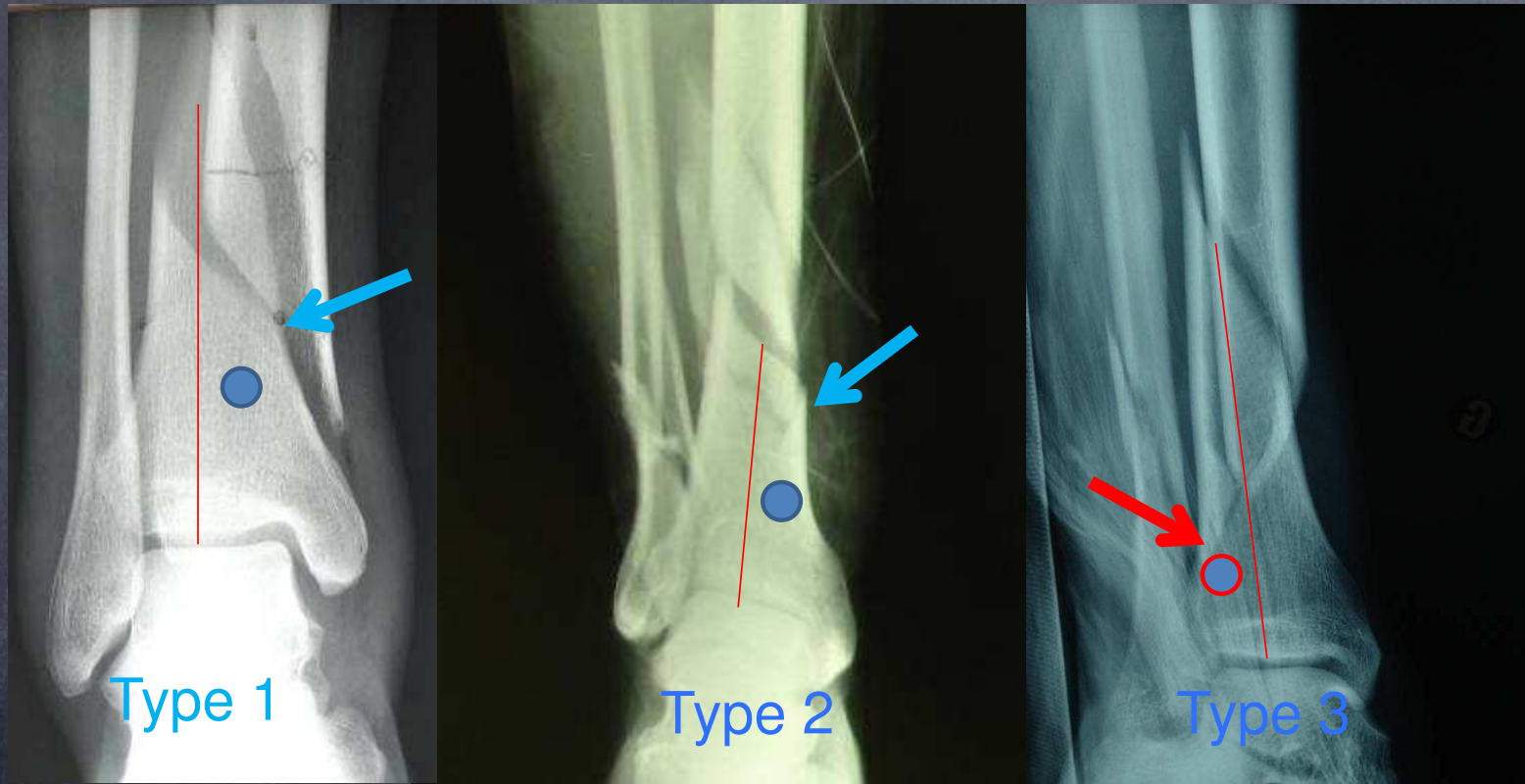
revision and new fixation after 1
week

Clinical Application: Distal Tibia

Anterior view classification for TMS screw placement and fibular stabilisation

	1	2	3
A			
B			

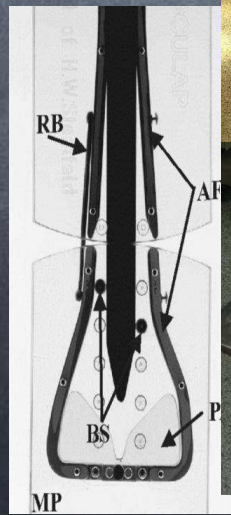
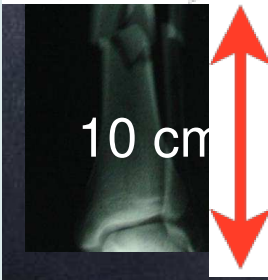
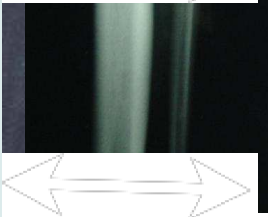
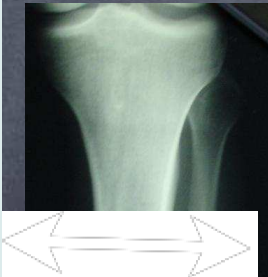
1 -Operative technique TMS screw location



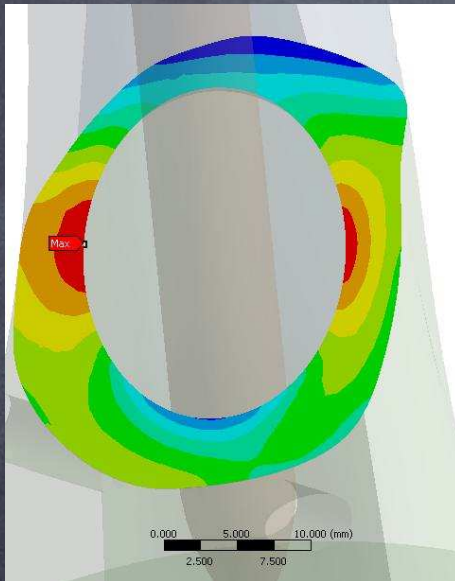
KRETTEK & all J Bone Joint Surg 1999, 81B, 963-968

STEDTFELD, & all

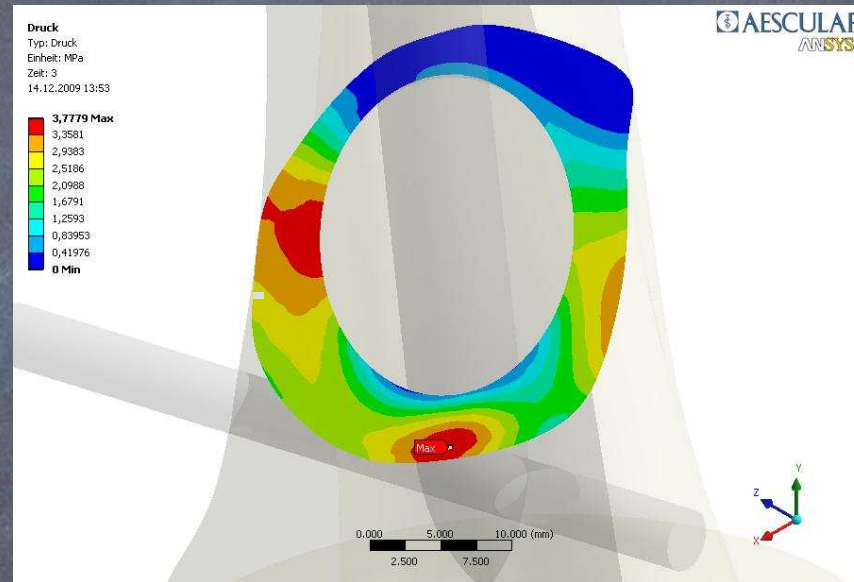
The Logic and Clinical Applications of Blocking Screws



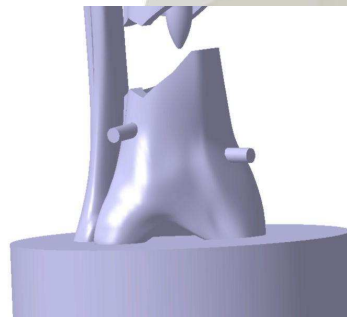
fracture compression forces

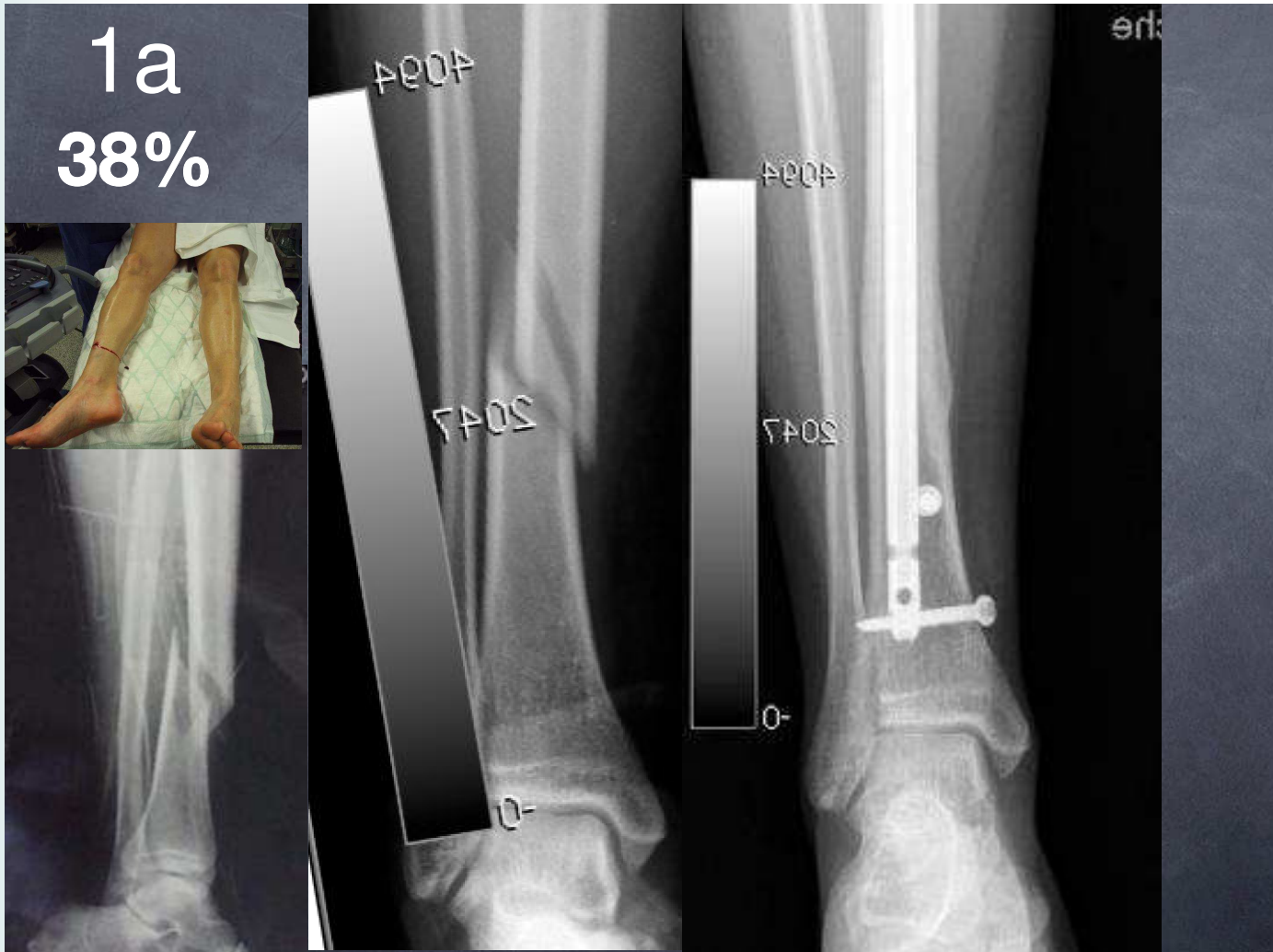


without TMS screw



With TMS screws







2a 26%

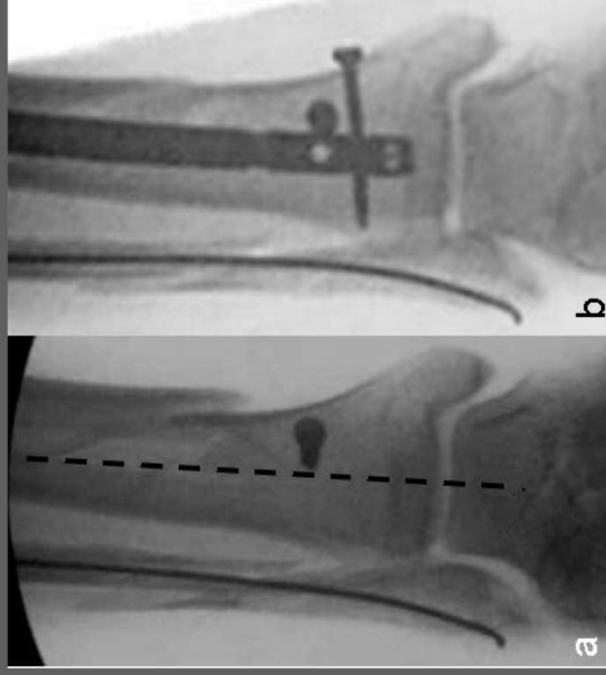


TYPE 2b

16%



Clinical Application: Distal Tibia



Type 2B fracture before and after nail insertion.
Fracture reduced via artificial point of support.

Clinical Application: Distal Tibia



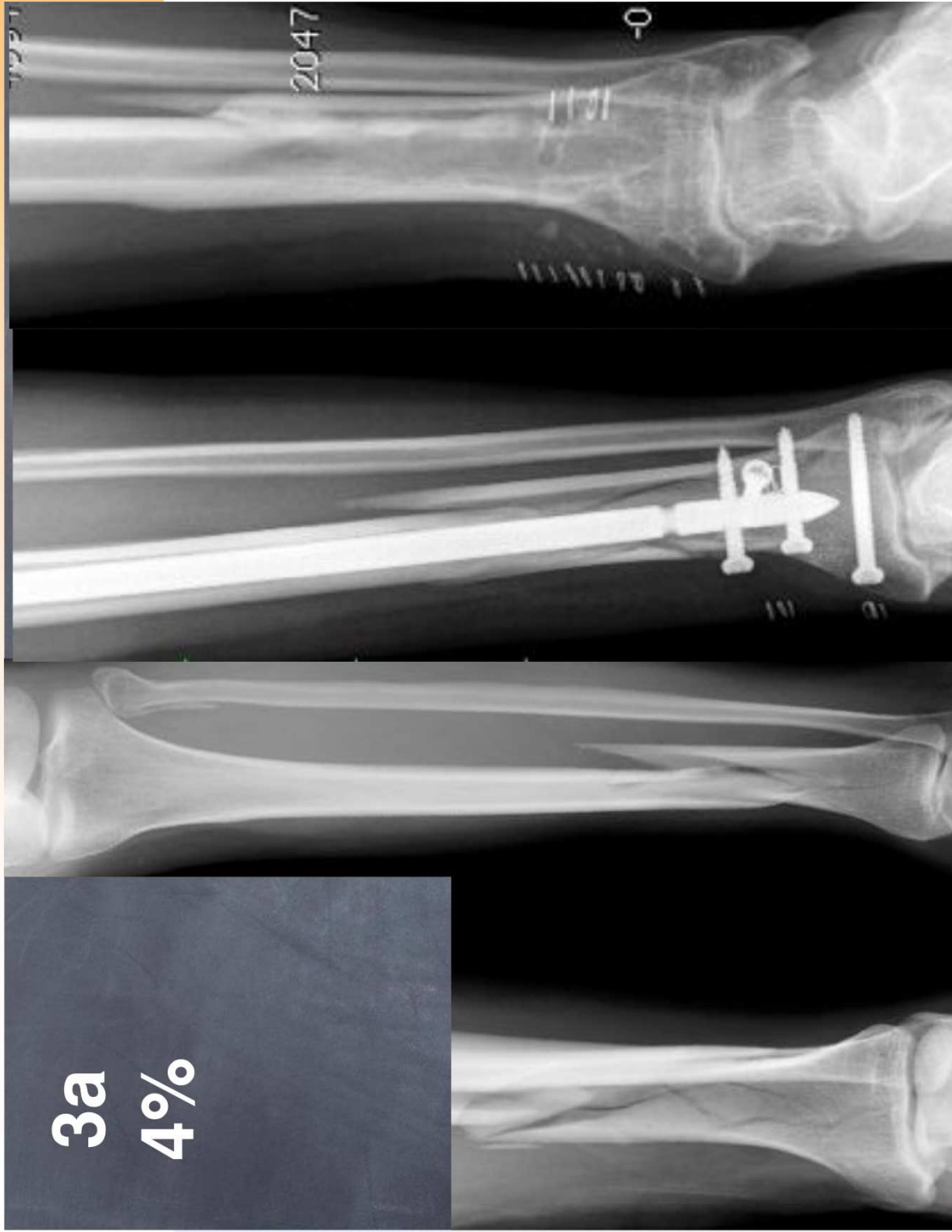
Type 2B fracture before and after nail insertion.
Fracture reduced via artificial point of support.

Clinical Application: Distal Tibia

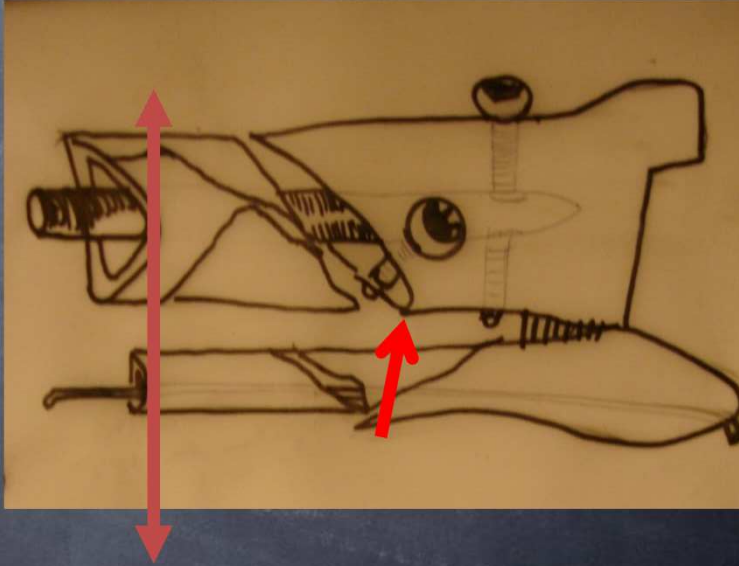


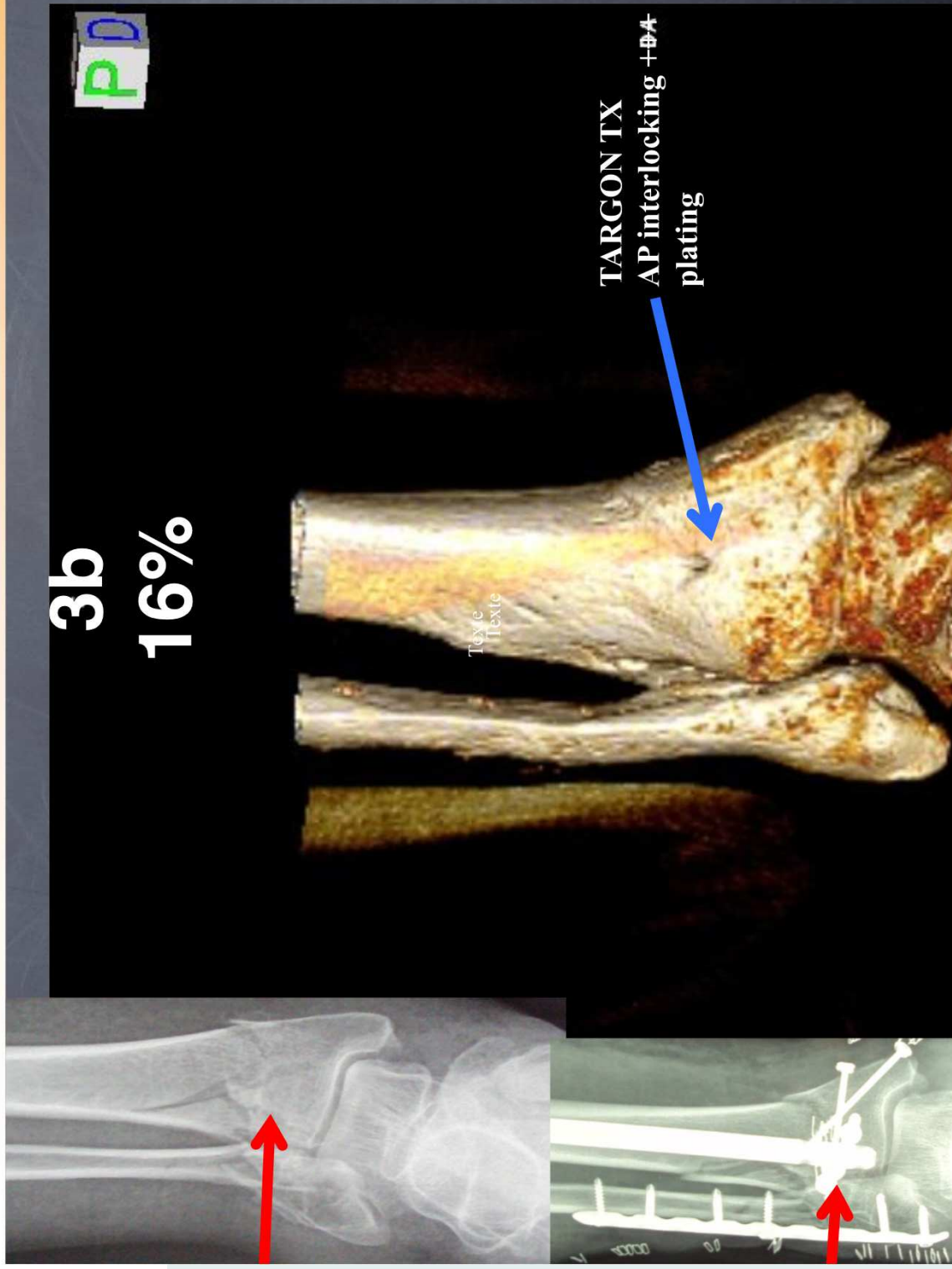
Type 3A fracture before and after nail insertion.
Fracture reduced via artificial point of support.

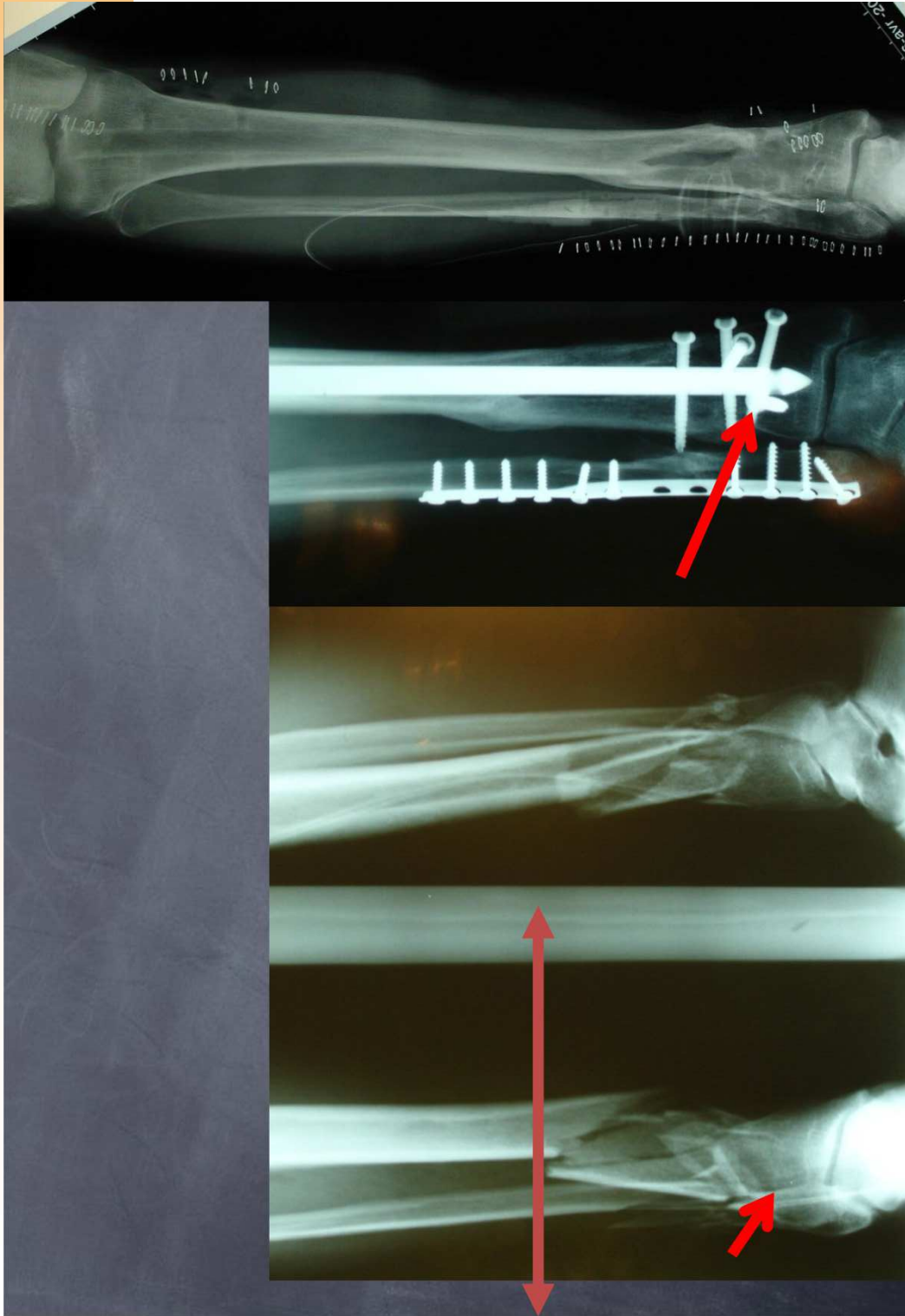
3a
4%



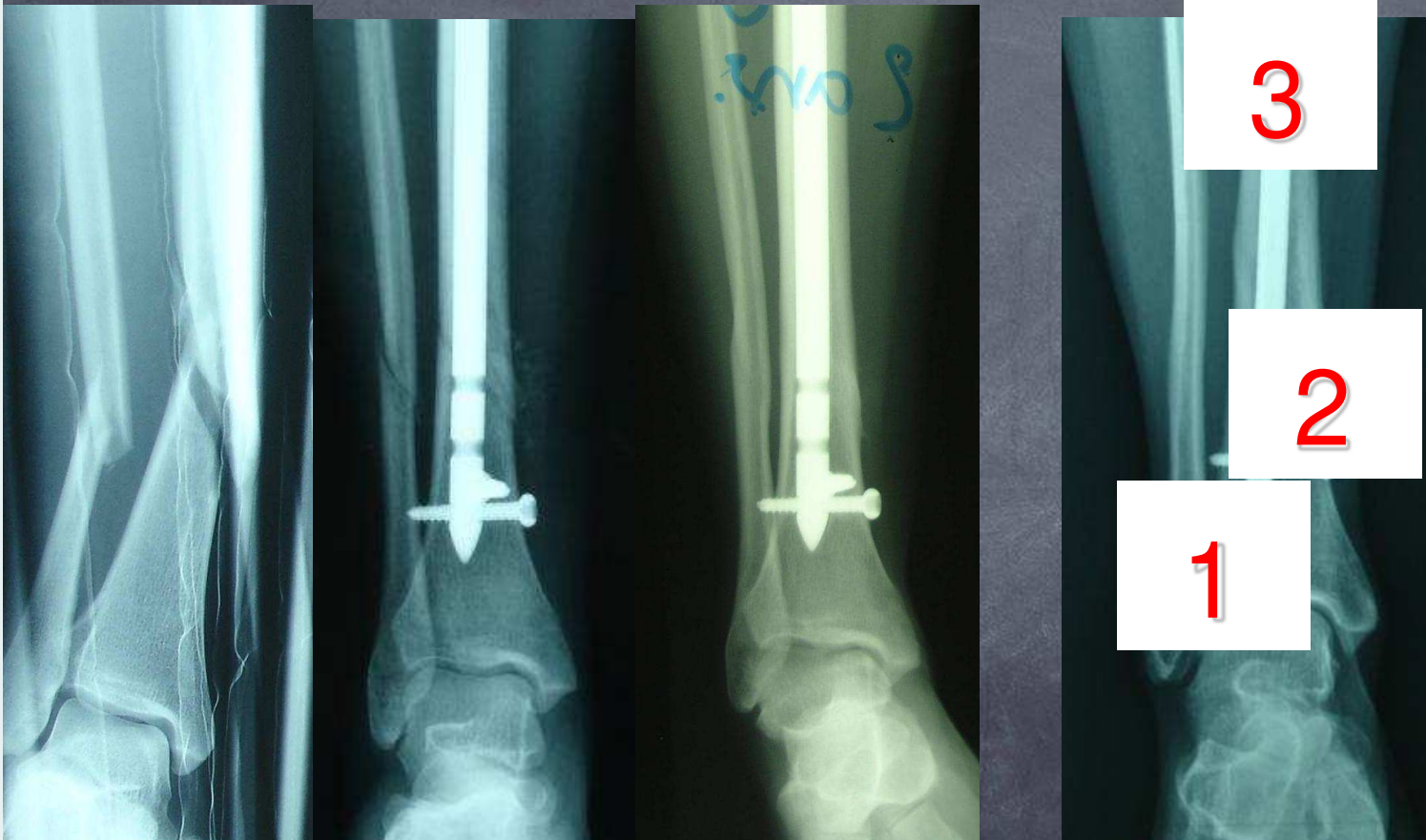
Type 3b





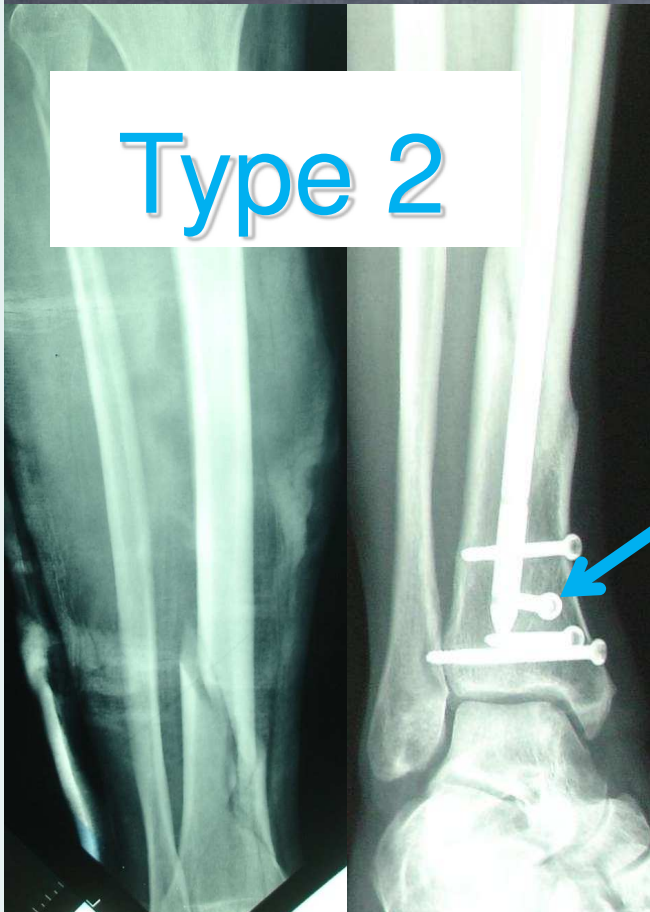


Type I = isostatic construct

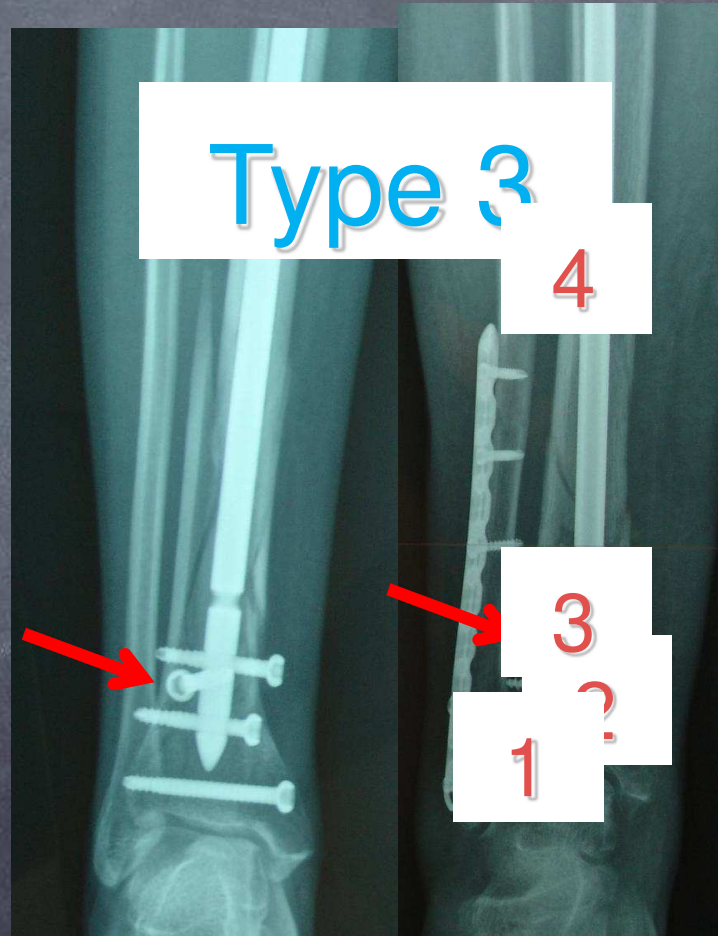


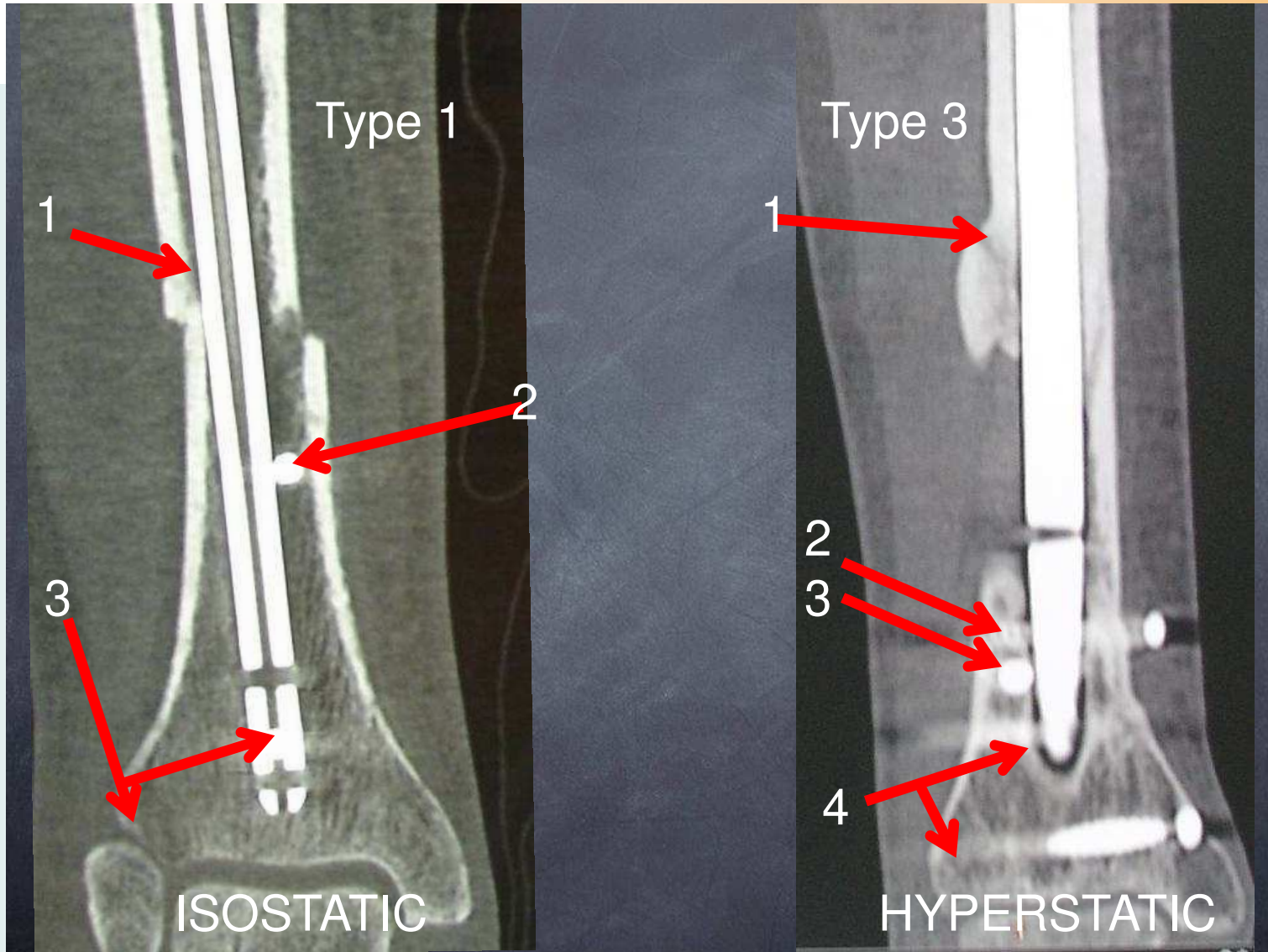
hyperstatic construct

Type 2



Type 3





General Aspects

Transmedullary Support Screws (Blocking screws)

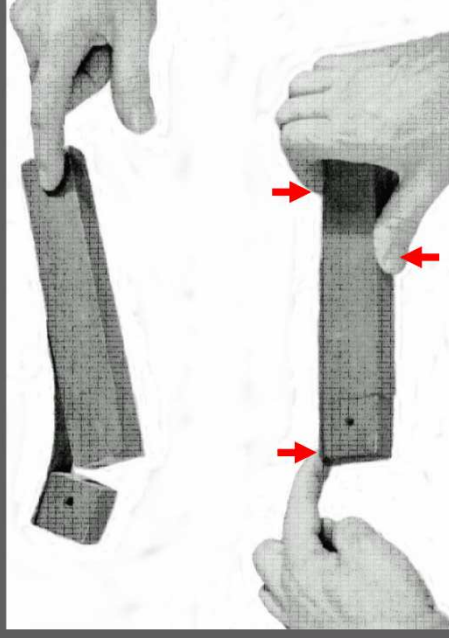
- allow easy indirect reduction
- effectively contribute to axial fracture stabilization
- effectively discharge the locking screws

With a transmedullary support screw in combination with a straight nail we establish an ***intramedullary 3-point fixation*** construct .

This corresponds to ...

Predecessors

External 3-point fixation

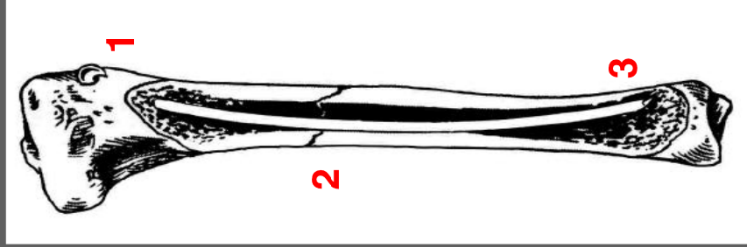


J. CHARNLEY (1993)

external
3-point
cast fixation

Closed Treatment of
Common Fractures
3rd Edition (1963)
Livingston Edinburgh London

Predecessors



Internal 3-point fixation

Rush-Pin

intramedullary 3-point fixation
with a prebent elastic nail

Conclusion

The use of TMS screws is

no trick!

It is a general stabilizing additive
to interlocking nailing
for indirect reduction and fixation of
dia-metaphyseal fractures