

# Ten commandments for TENS



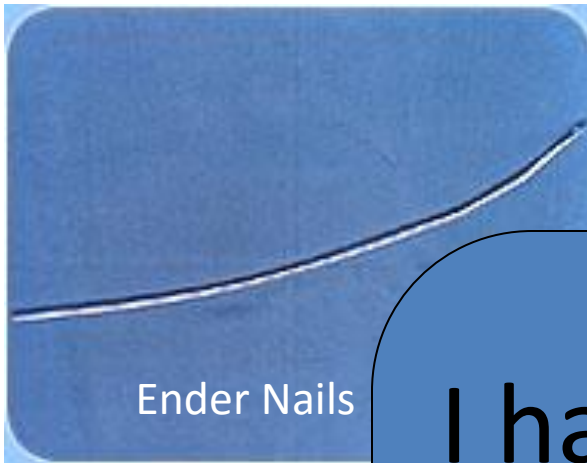
Dr Sandeep Patwardhan  
Paediatric Orthopaedic Surgeon  
Pune



1..Thou shall  
understand the  
concept of TENS



Rush Pins



Ender Nails

I have been using these for years  
How are the TEN different?





Elastic  

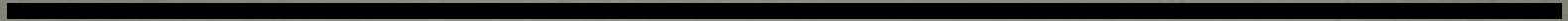
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Stability

# The concept

- Two Pre bent elastic nails are inserted from either sides of the metaphysis
- The 'bend' of the nails is more than what the canal can easily accommodate
- The elastic recoil of the two nails stabilizes the fracture.

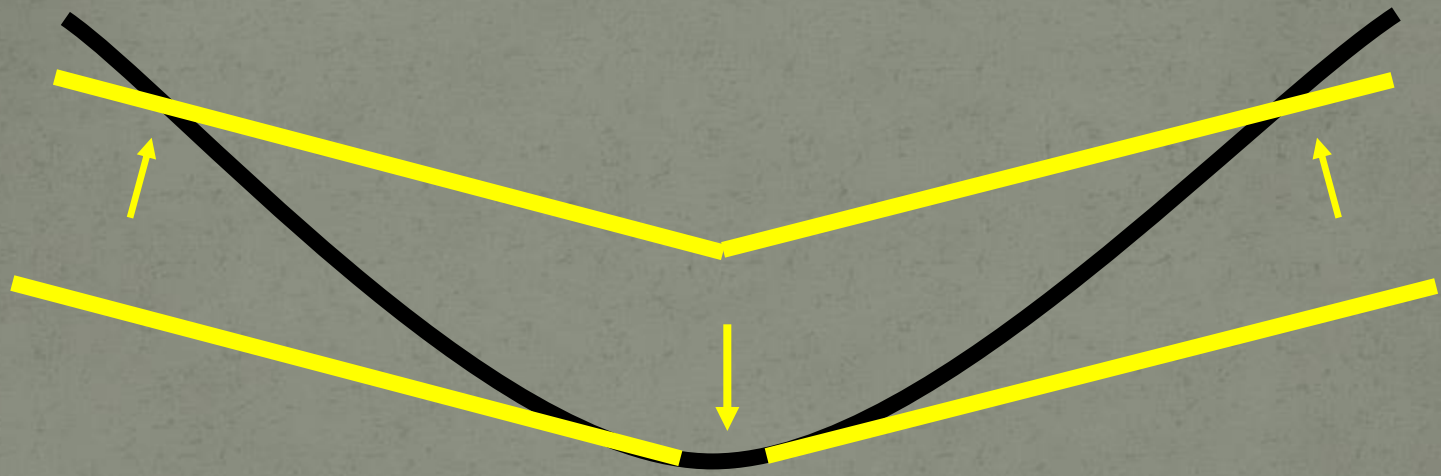
# What is elastic stability



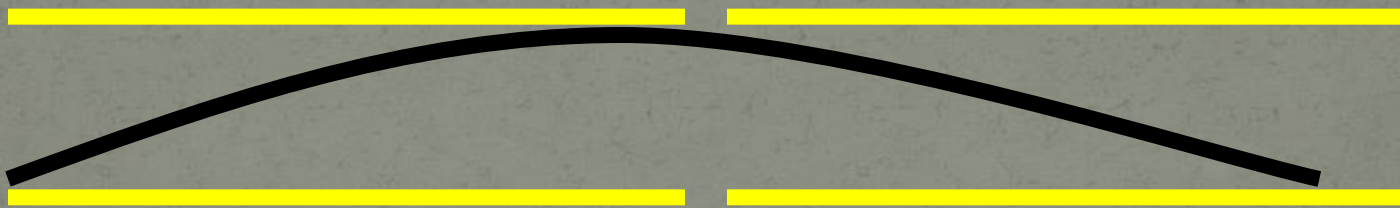


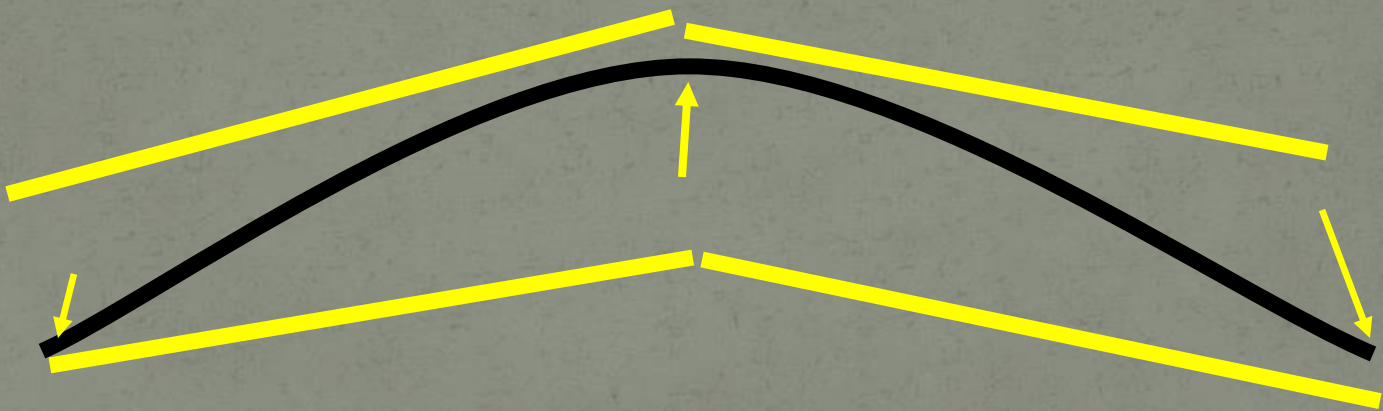






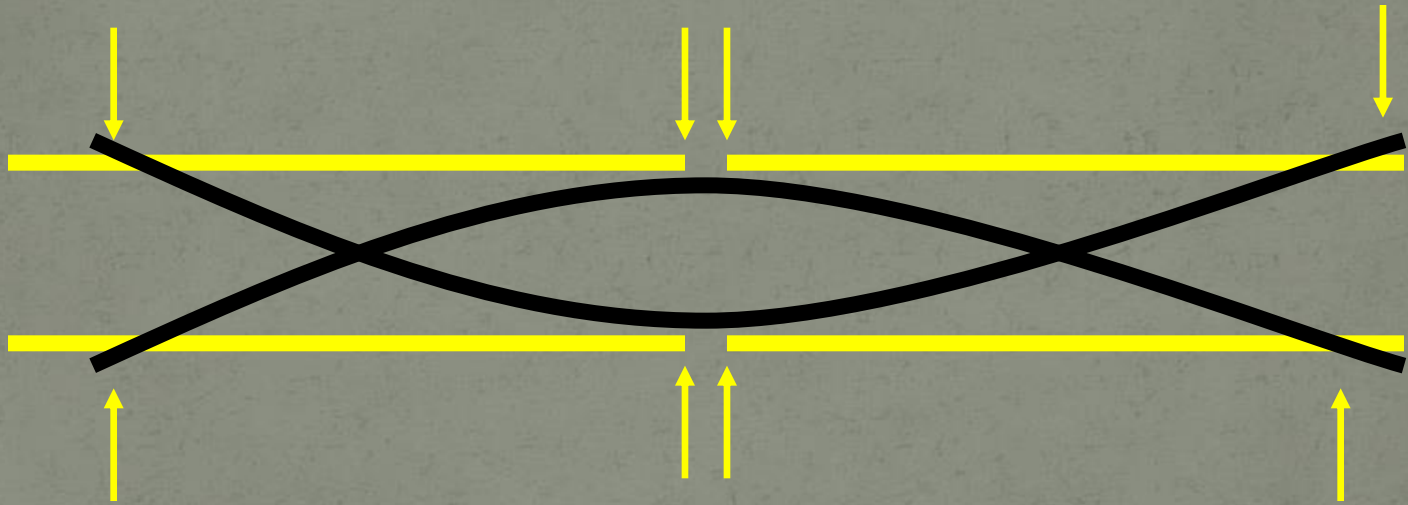








# Six Point Fixation





ESIN

A stability obtained  
in moving “elastic” conditions



2..Thou shall  
choose the  
correct  
indication

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לא תגנב  
זכור לא תענה  
כבוד לא תחמד



# Indications

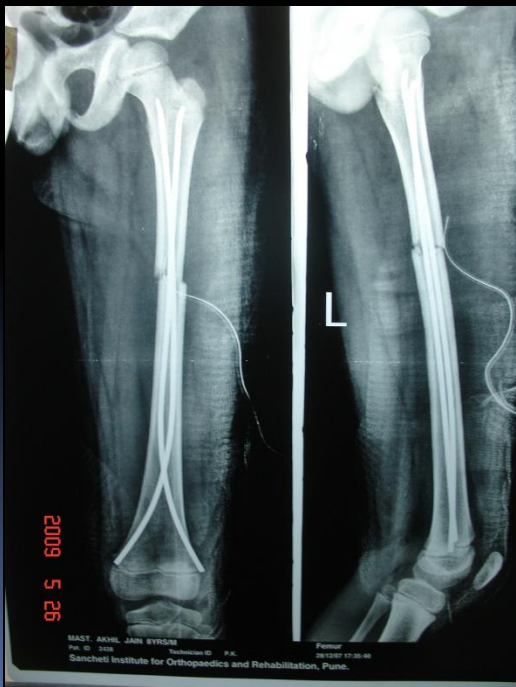
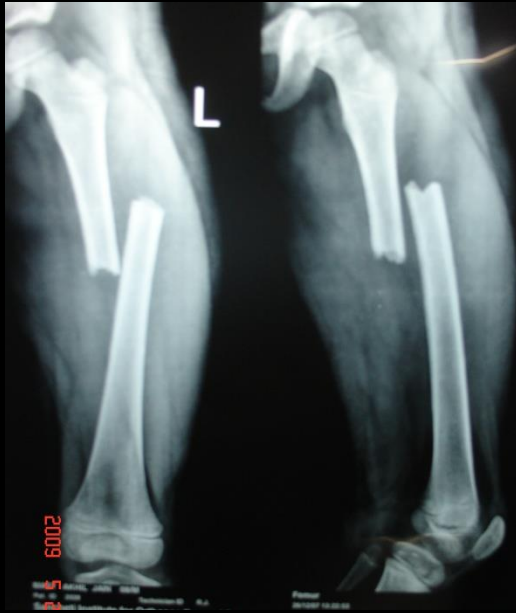
- Mid-diaphyseal #
- Transverse, short oblique or short spiral fractures with minimal comminution

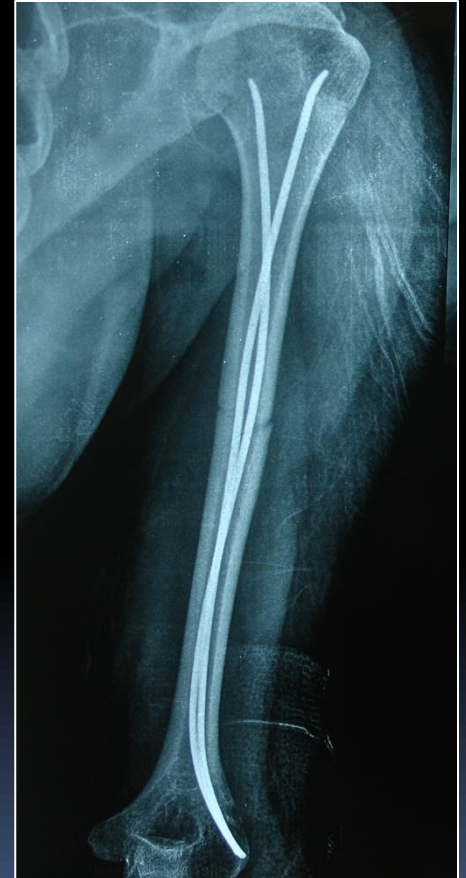
In children 5 to 12 years old < 50 kg

## Extended

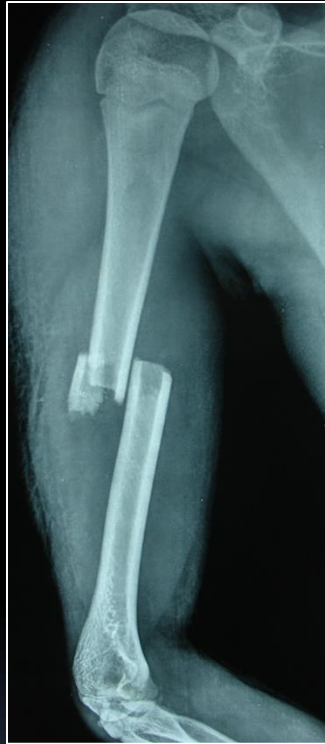
- Subtrochanteric fractures
- Supracondylar fractures
- Comminuted fractures

# Indications





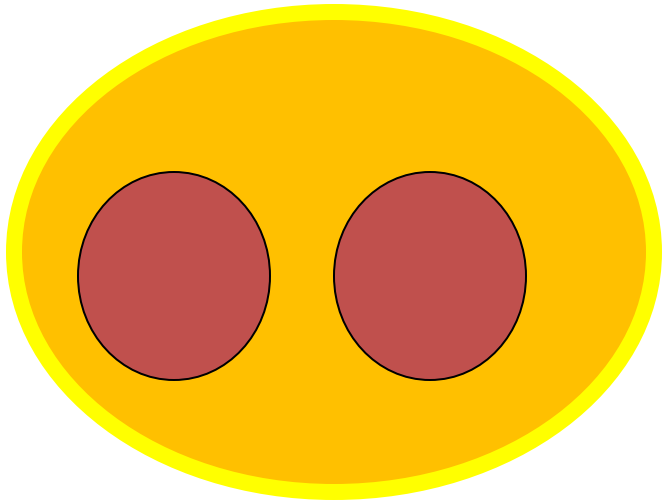
# Relative indications



3..Thou shall  
understand the  
Nail & follow  
bending  
principles



# 3.1-Nail size



40 percent of narrowest canal diameter

- Too thin easy to pass but no elastic stability
- Too thick difficult to negotiate

- Measure inner canal diameter X 0.4
- Keep a nail on patient's thigh and take a carm picture ...entry to IT line

KHATTIJA 2

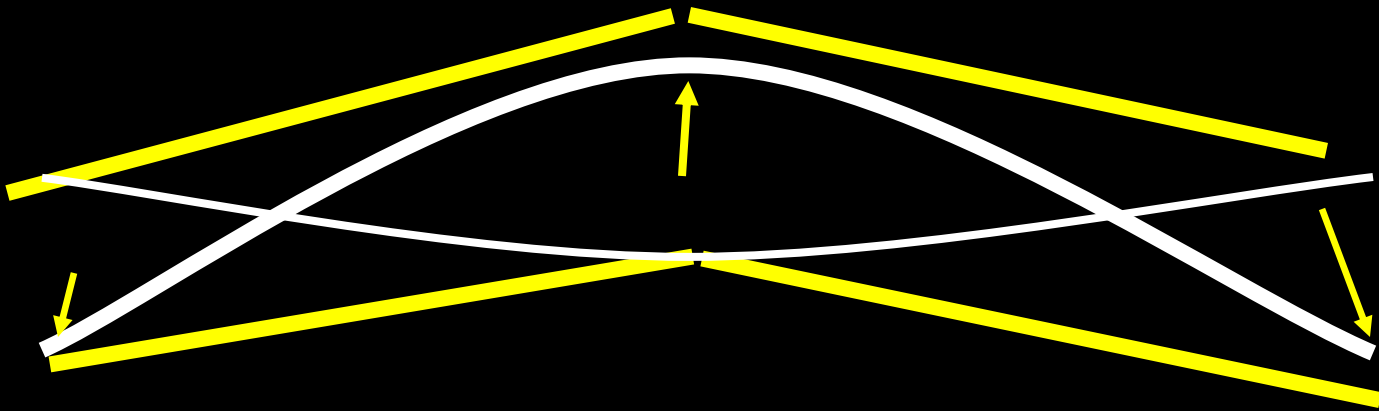


DR T U N  
Nailing

Thu Nov 1 2012 12:42:15

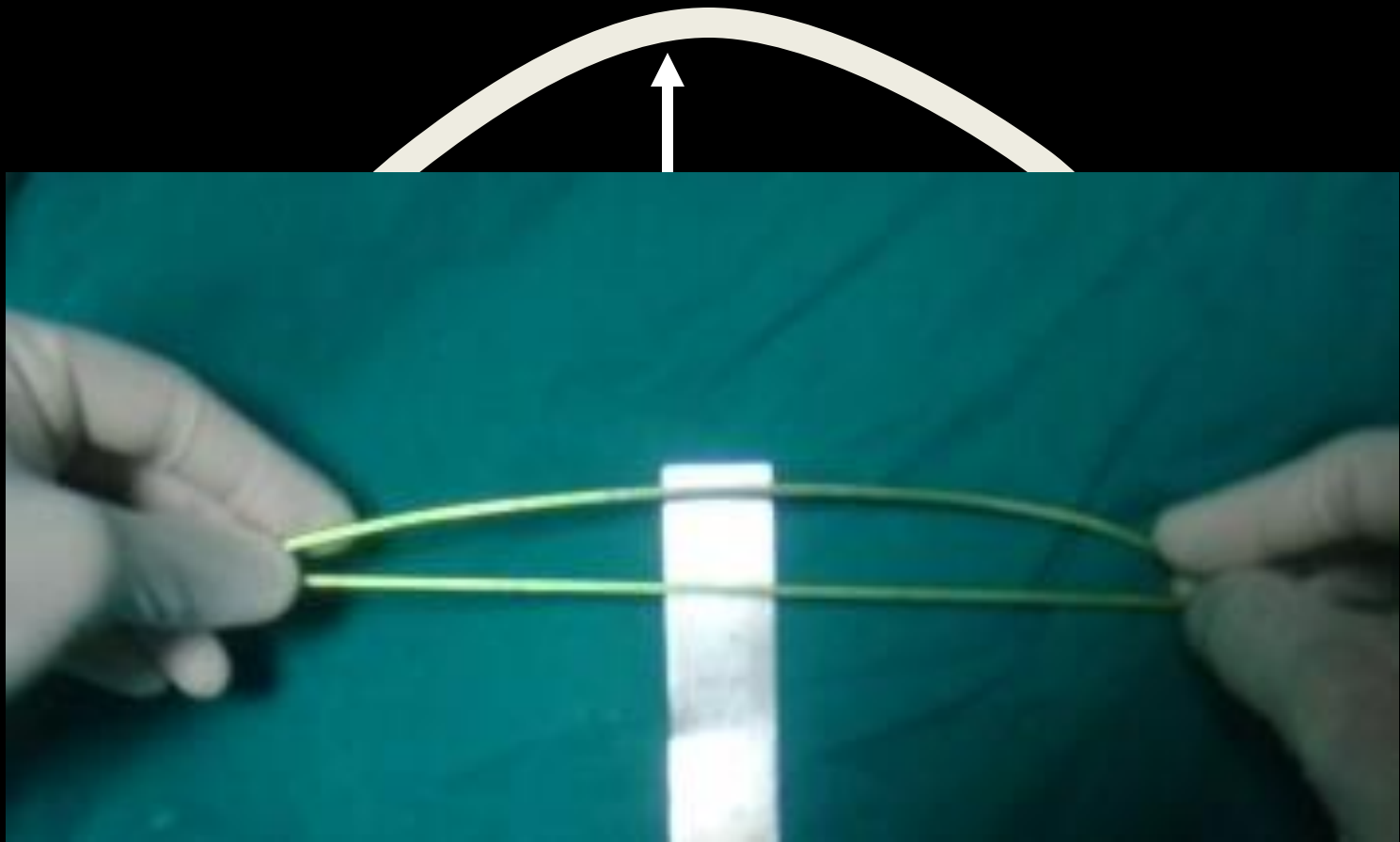
| Bone    | Size in mm |
|---------|------------|
| FEMUR   | 3 to 4     |
| TIBIA   | 2.5 to 3.5 |
| HUMERUS | 2 to 3     |
| FOREARM | 2 to 3     |

## 3.2 Same size nails



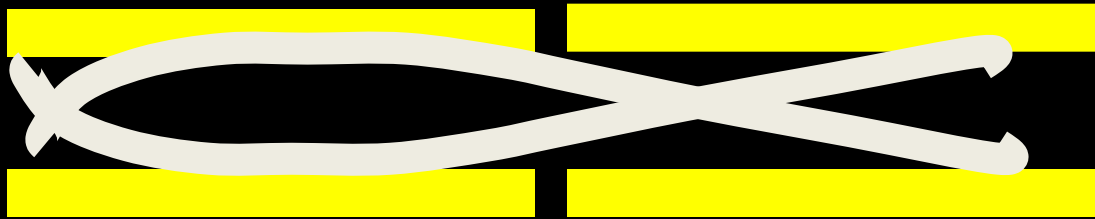
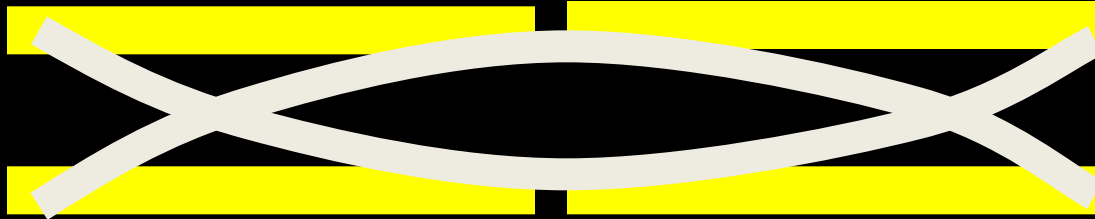


## 3.3 Amount of bend



**diameter**

## 3.4 Apex of bend



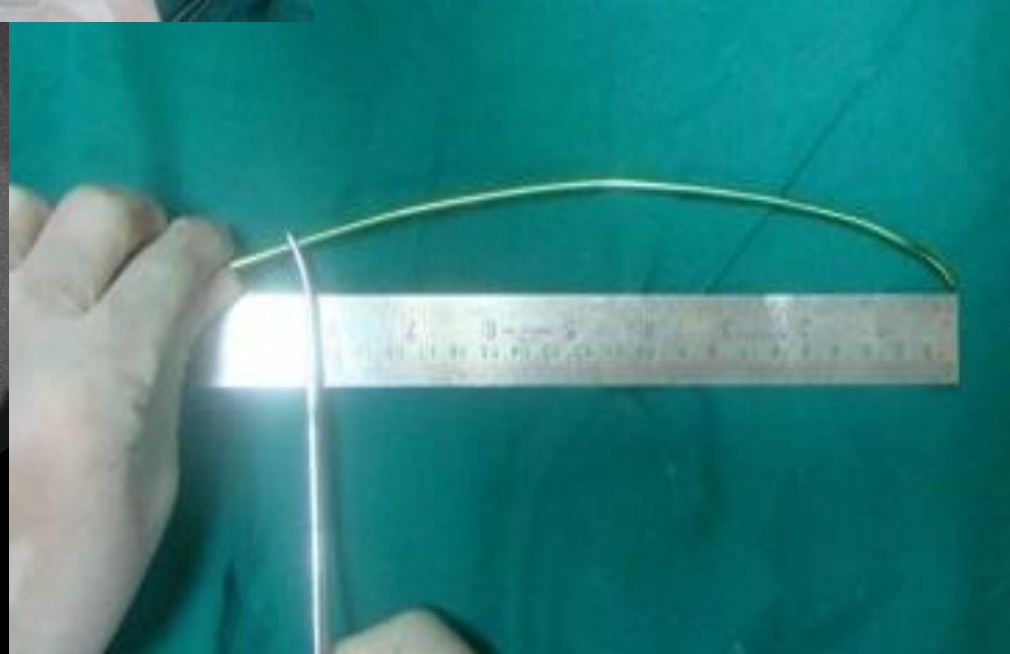
MAST JEET  
18 MALE  
PAT335  
PT335JEET



16:51  
08:00  
PAT335  
PT335



DR TARAL NAGDA

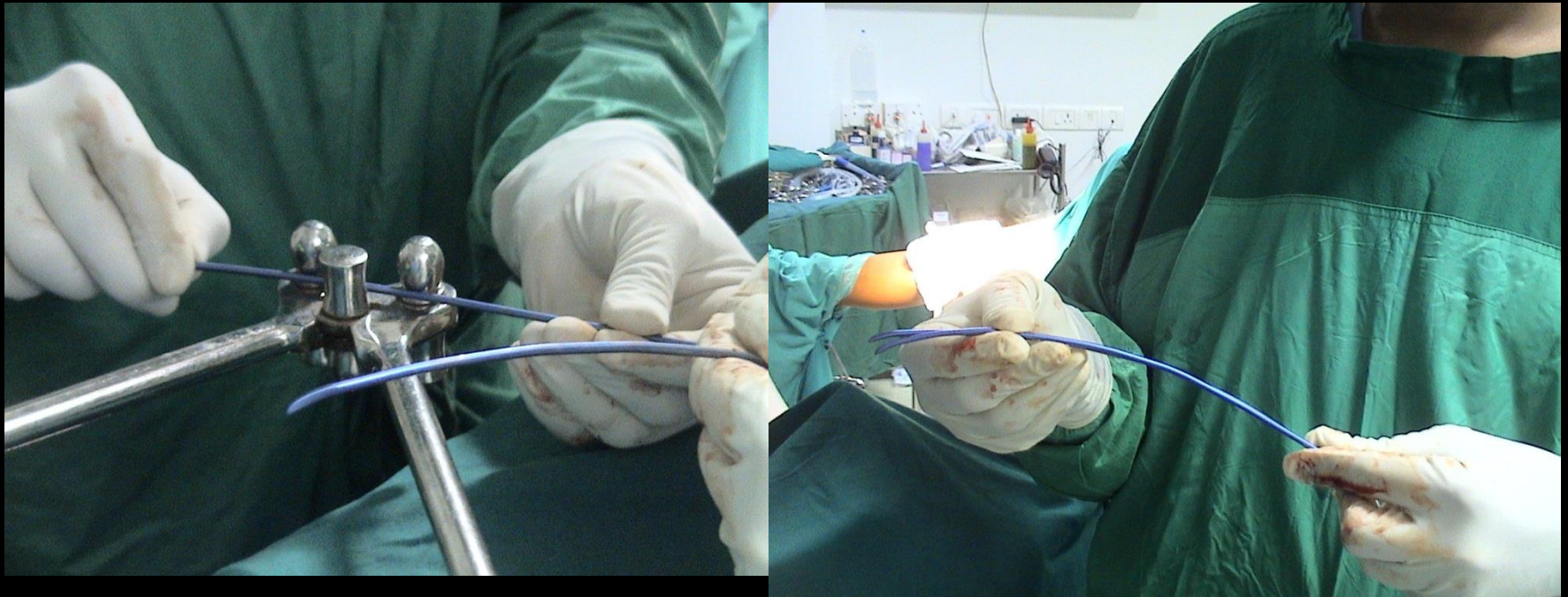


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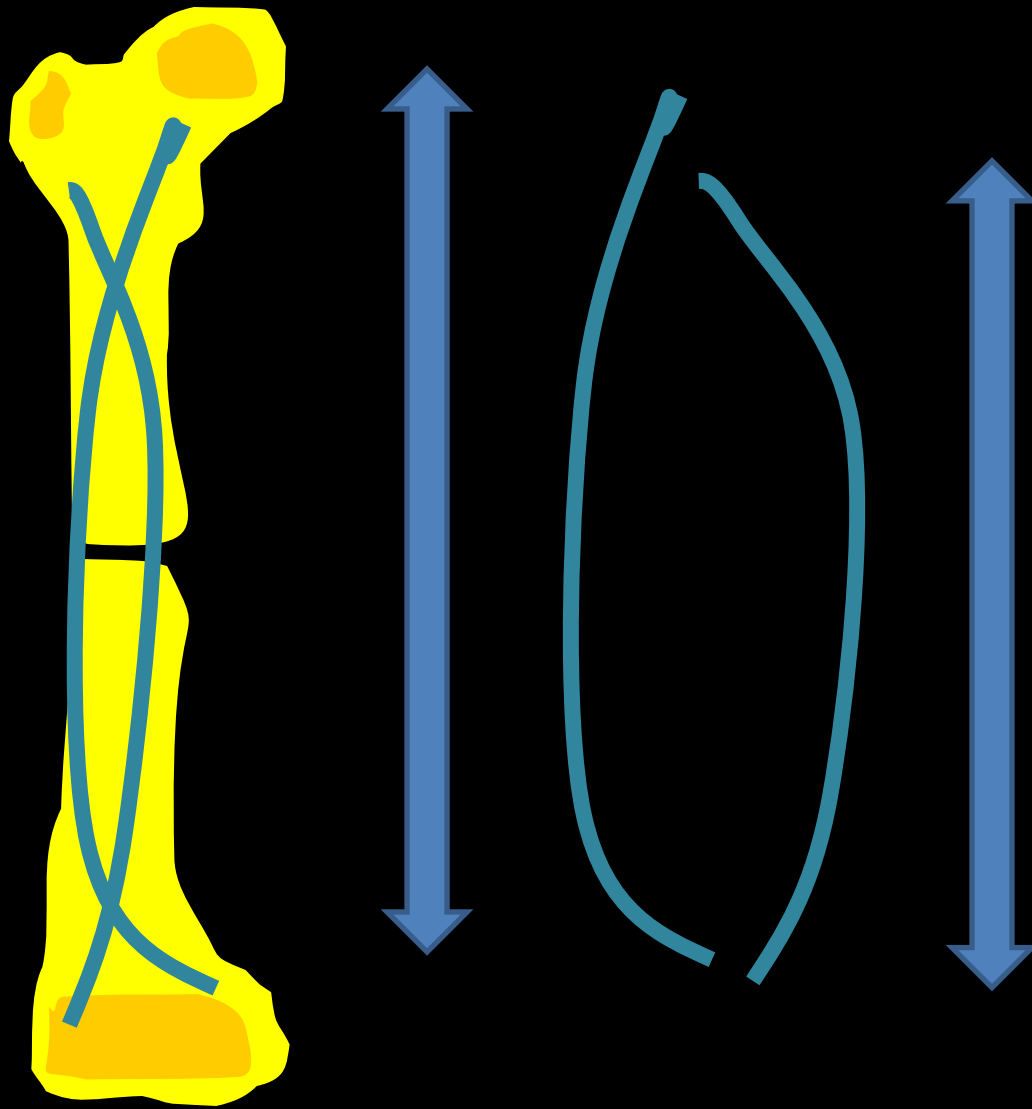
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18:09:2006

# Symmetrical bending

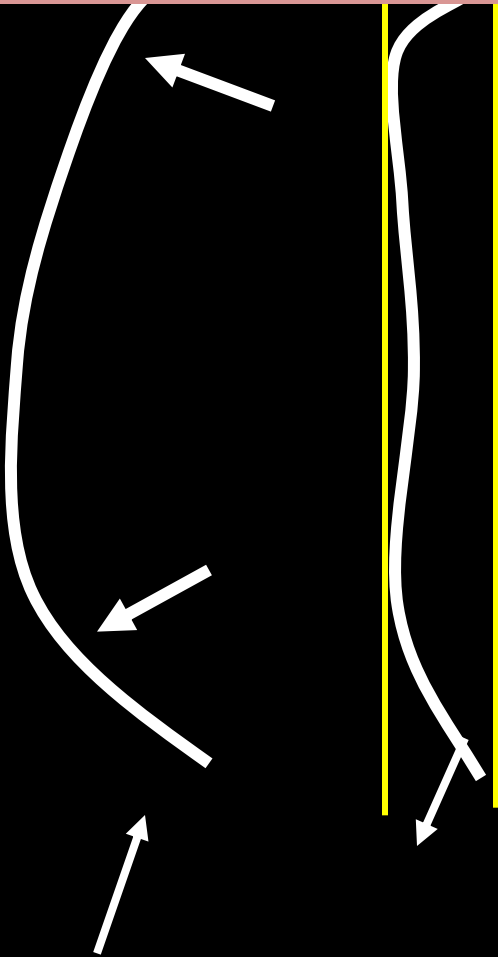




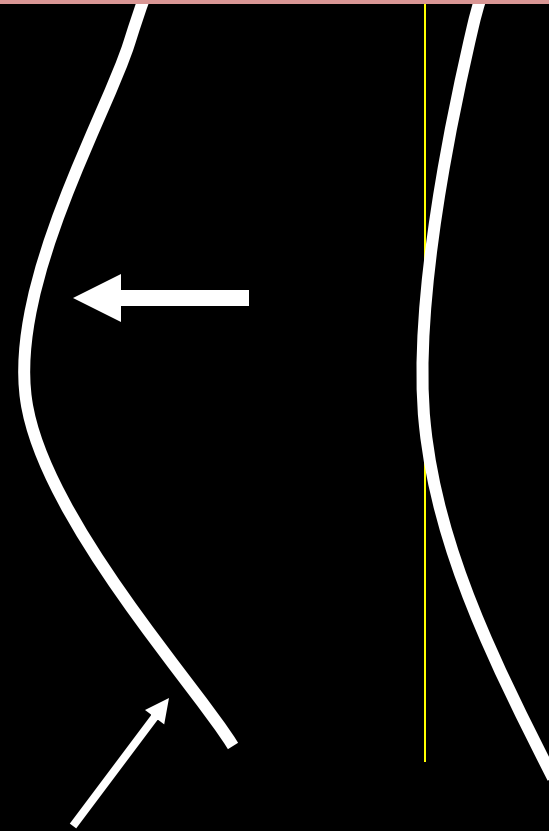
Bending length of medial entry nail longer than the lateral entry nail



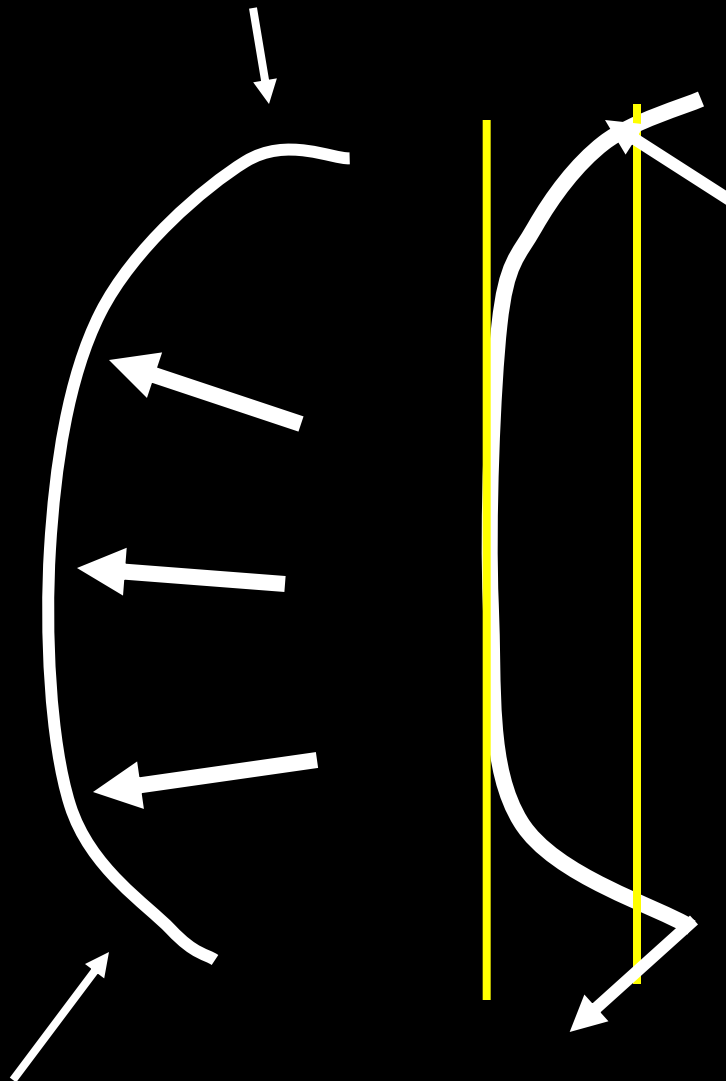
## 3.5 Smooth bending



**Bending at the ends**



**Bending at the apex**



Uniform Bending



4..Thou shall  
make an  
adequate entry  
point



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זכור לא תענה  
כבוד לא תחמד



PAT335JEEET GADA  
 PAT335  
 18 MALE  
 MAST JEET B. GADA

DR. TARAL NAGDA

GHATKOPAR  
 PARAKH HOSP.

I2241

DIXAS II  
 08:09:5806  
 15:43:38:593



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 PT335JEEET GADA

PARAKH HOSP.  
 GHATKOPAR

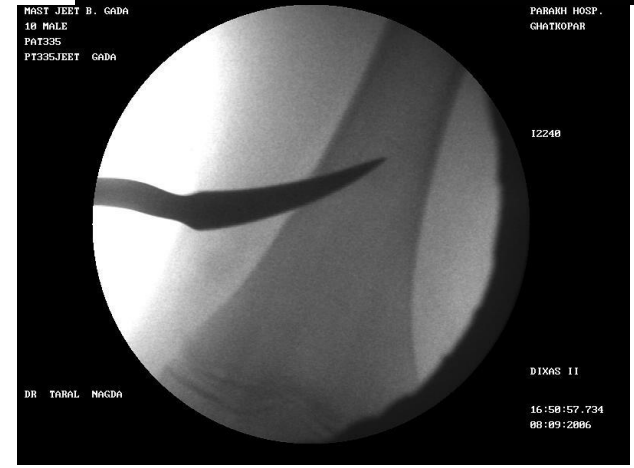
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DR. TARAL NAGDA

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 08:09:2006

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MAST JEET B. GADA  
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 PAT335  
 PT335JEEET GADA

PARAKH HOSP.  
 GHATKOPAR

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DR. TARAL NAGDA

DIXAS II

16:58:57.734  
 08:09:2006

Irritation of  
suprapatellar  
pouch



Irritation  
of  
ligaments











5..Thou shall  
advance nail  
correctly

Khushnuna 2



DR T U N  
Nailing

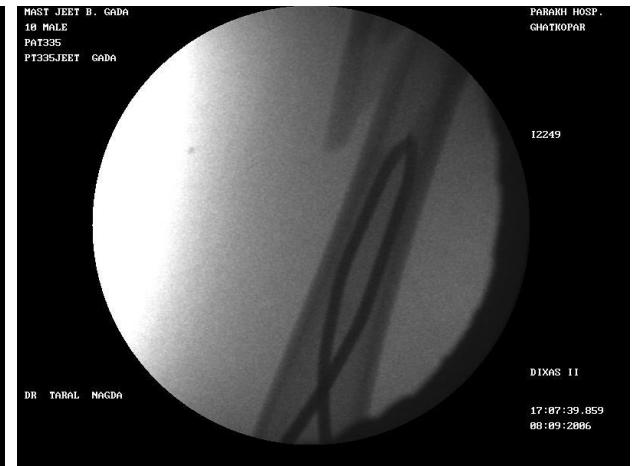
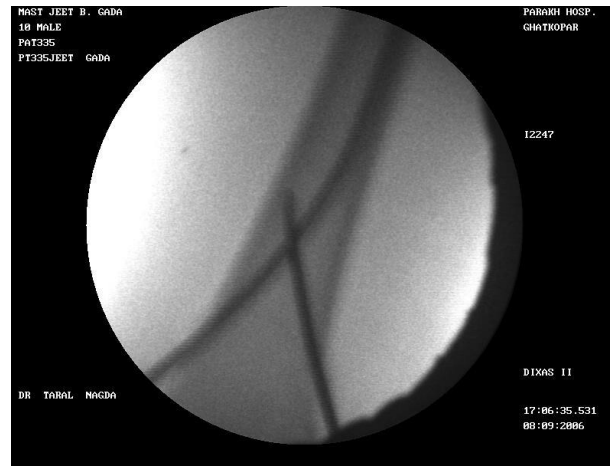
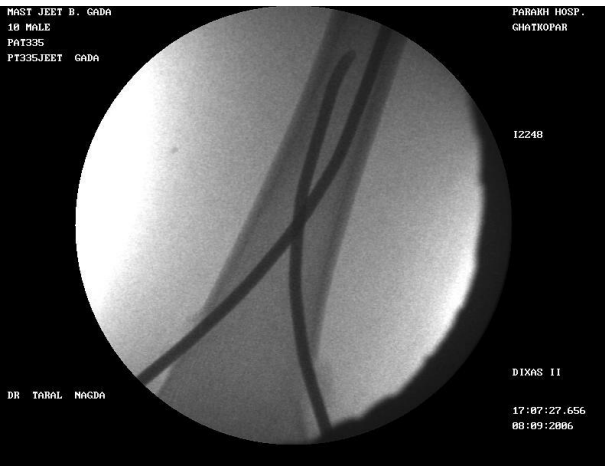
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# Nail Insertion



Use two chucks  
Do not hammer  
Avoid rotation





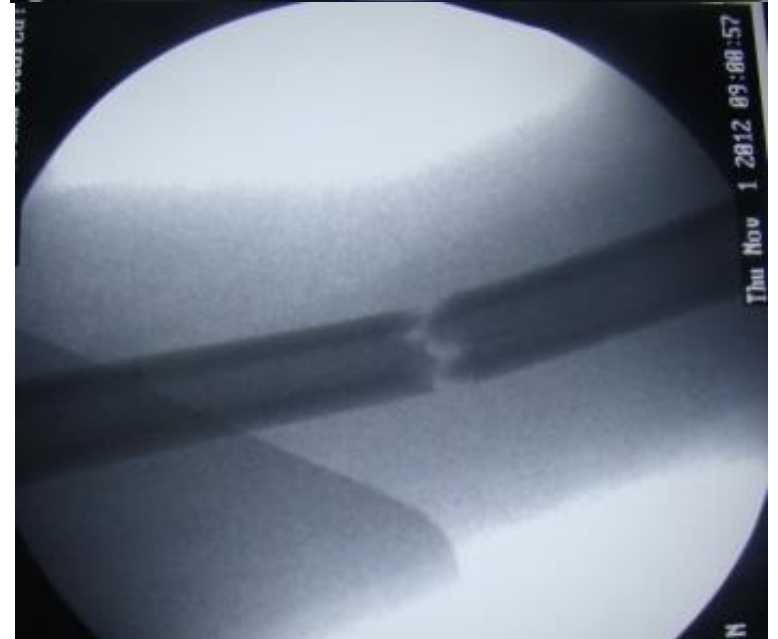
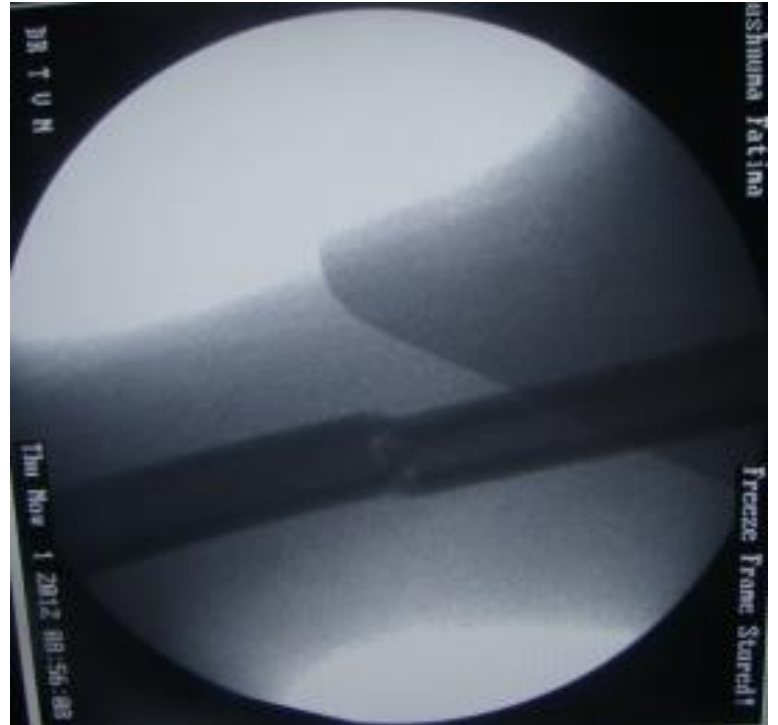
**Snaking due to severe rotations**

**6..Thou shall  
use proper  
reduction  
manoeuvres**

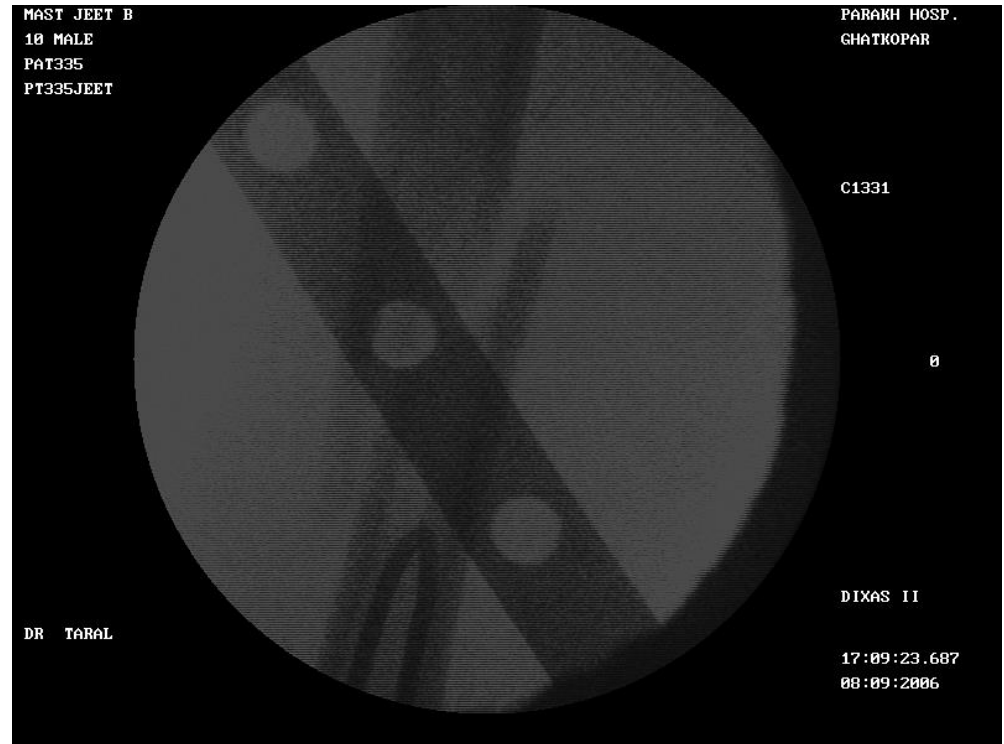


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זכור לא תענה  
כבוד לא תחמד

# 6.1 Traction



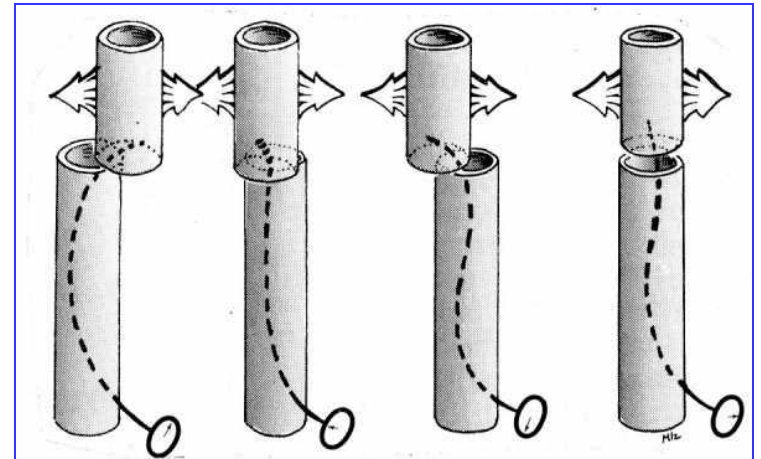
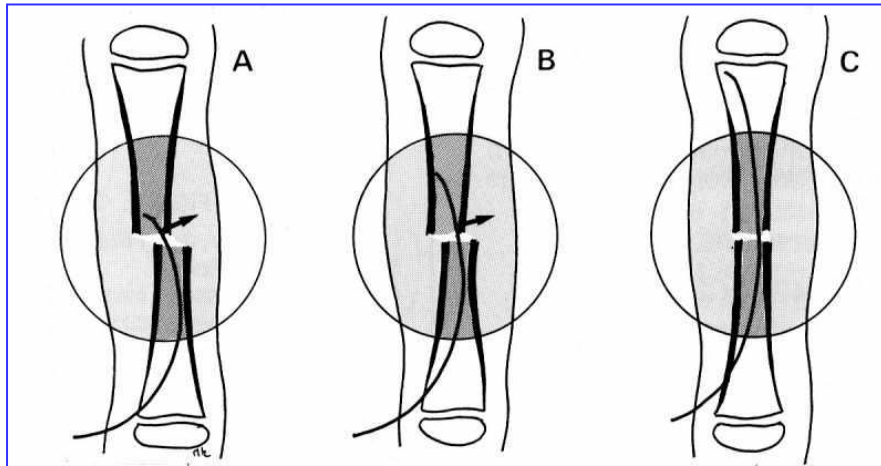
# 6.2 Reduction tool



## 6.3 Use Pins as reduction tools



# 6.4 Use of hockey stick bend

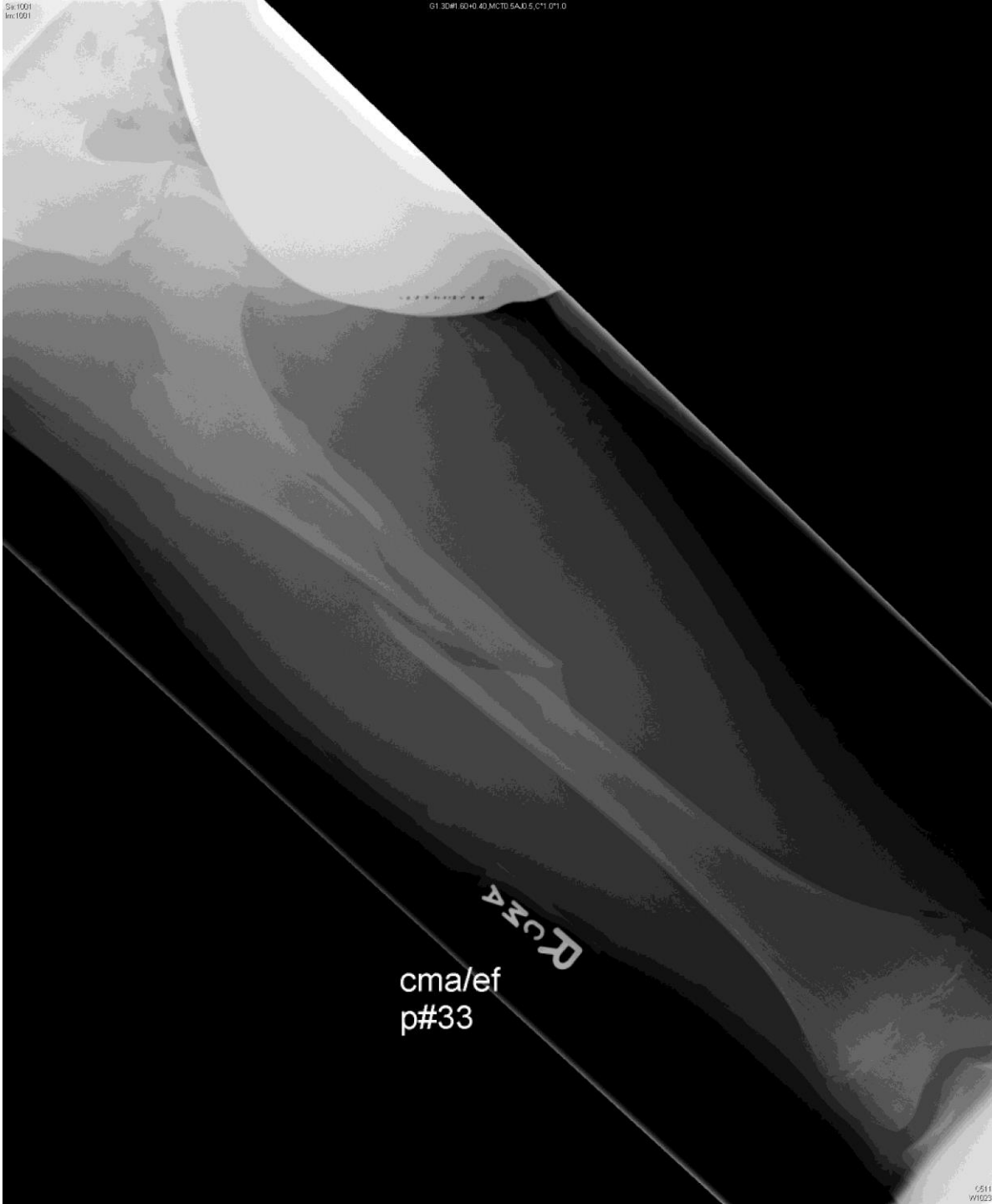


7..Thou shall  
maintain length  
at all times



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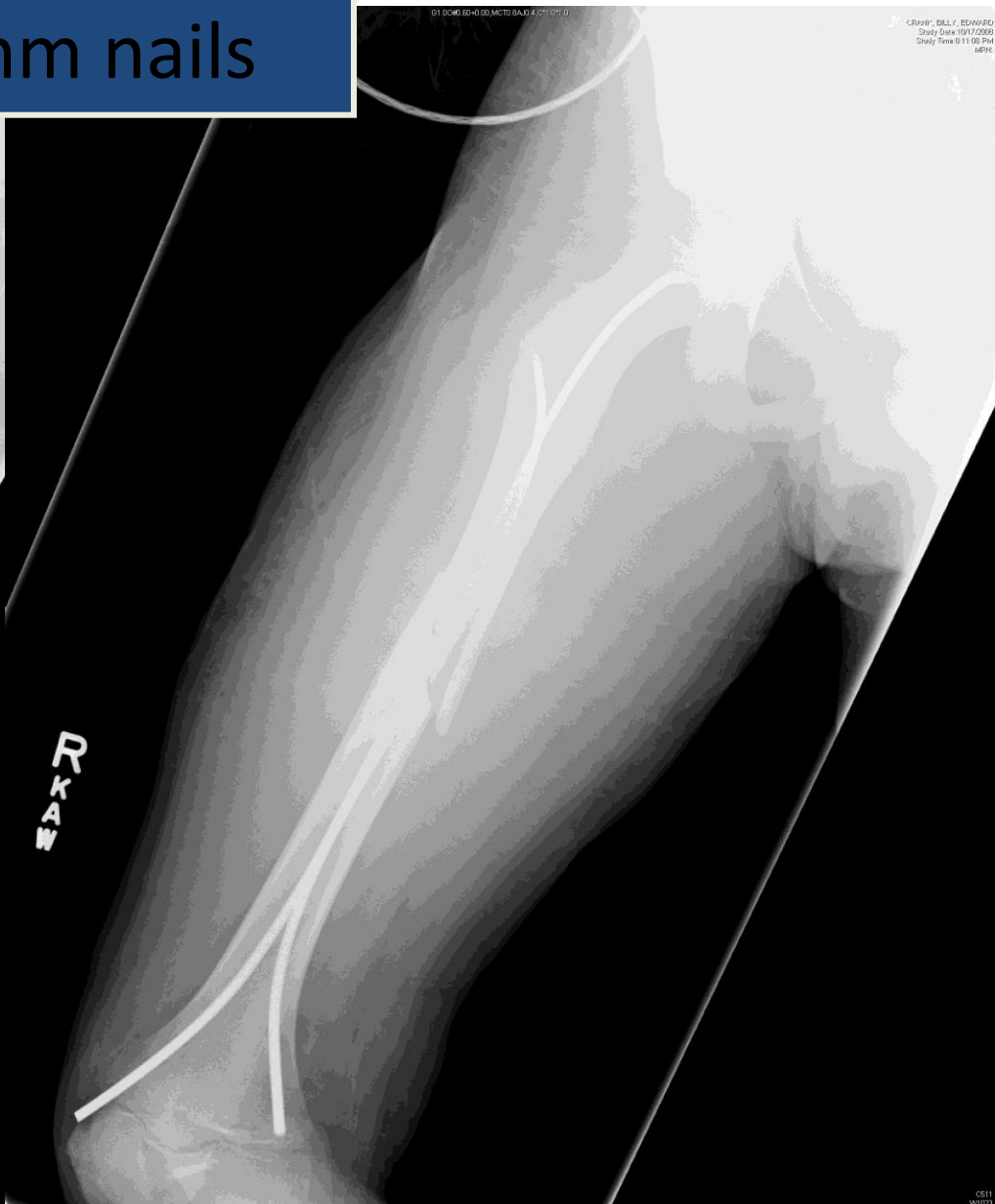
cma/ef  
p#33

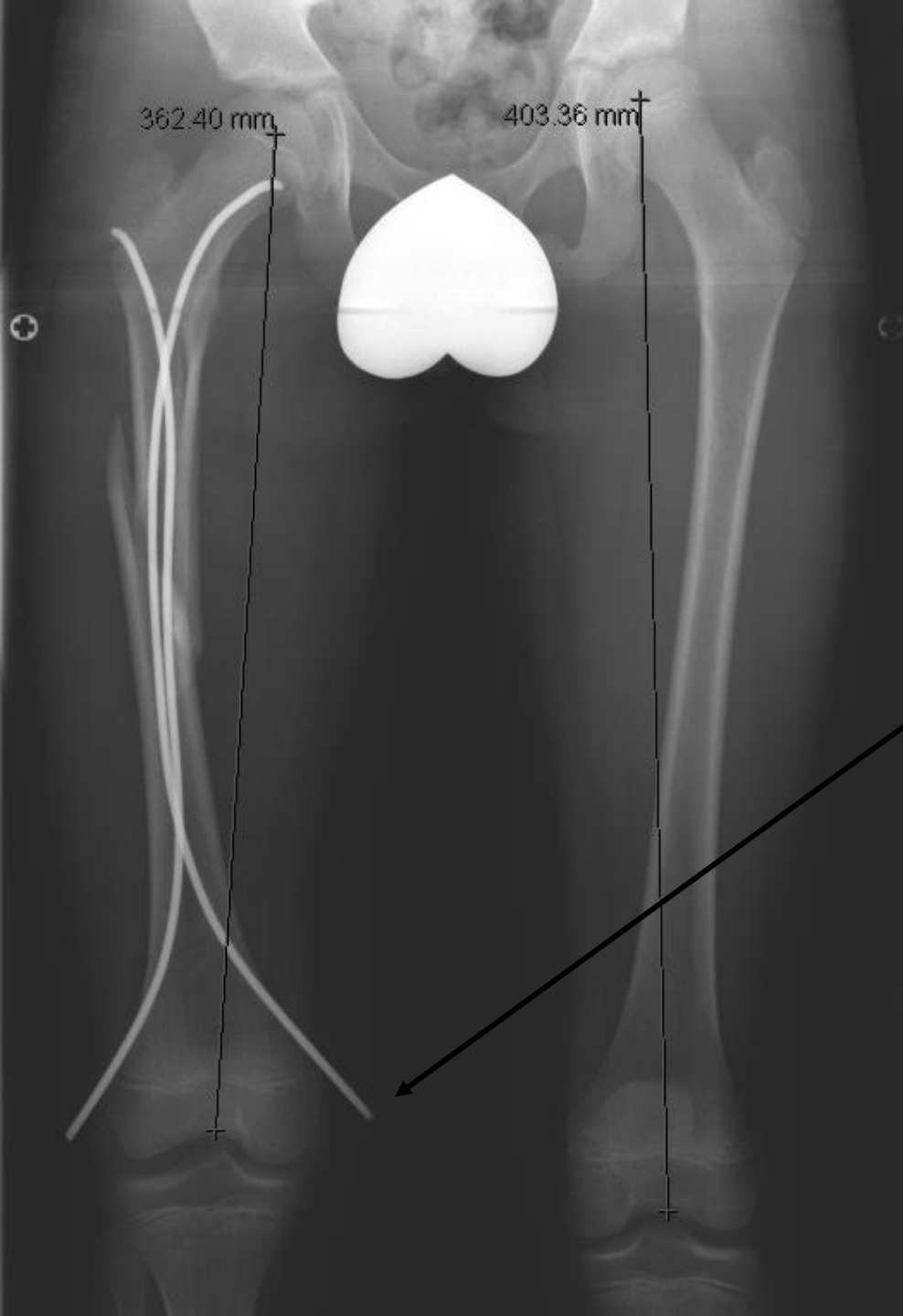
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# 3.5 mm nails

RT  
AL/KW





4 cm shortening

Nail protrusion

# The End Cap





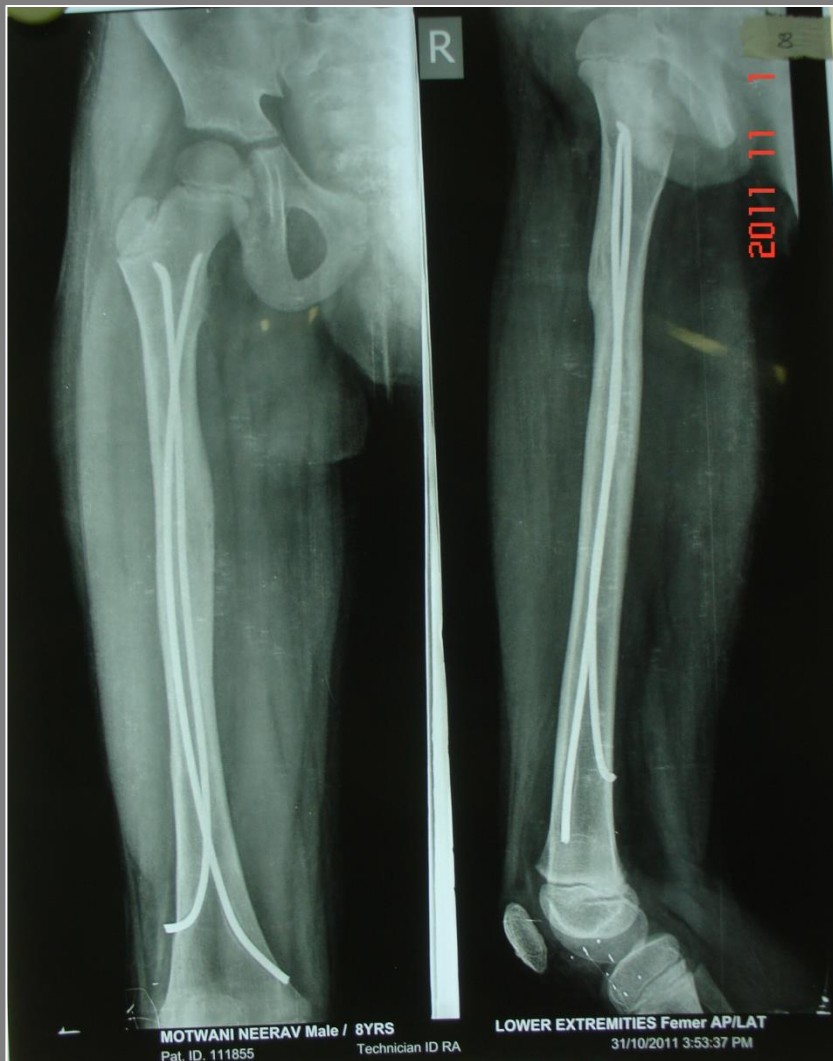
# Hybrid fixation



# Final healing



# At implant removal





8..Thou shalt seat  
the nails flush





Ends of nails can cause  
soft tissue irritation

## Knee effusions

- Usually sympathetic
- If nail introduced anteriorly
- If nail twisted anteriorly
- If nail rotates secondarily



## Avoid nail tip problems



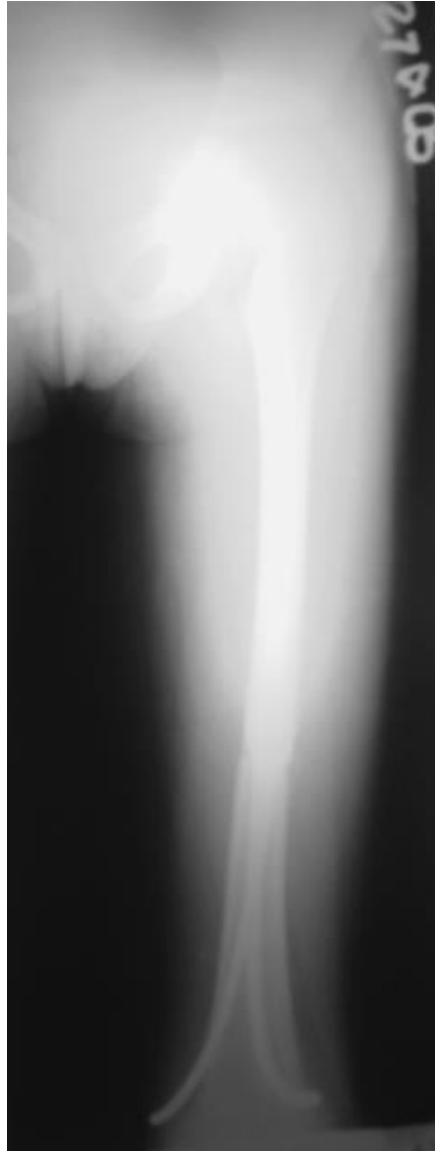
Ideally tip flush with cortex



9..Thou shall  
check rotations  
before final  
seating

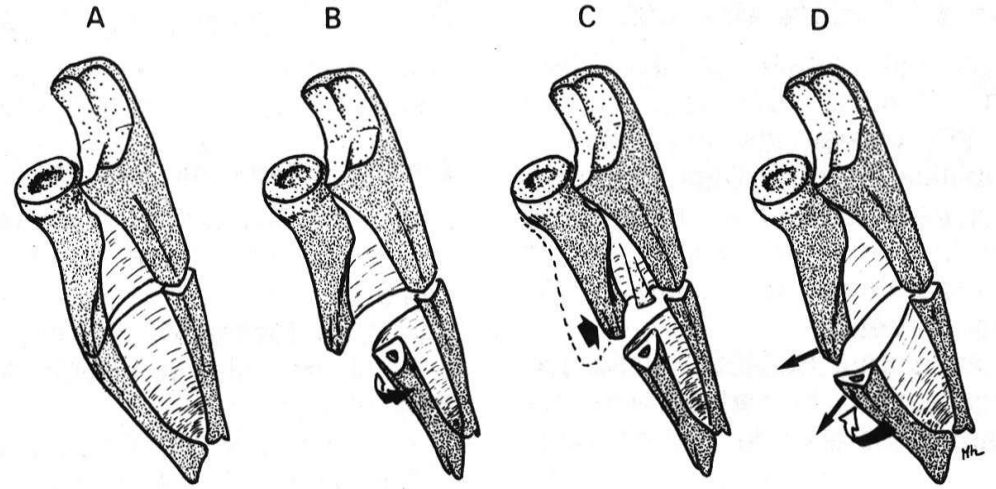


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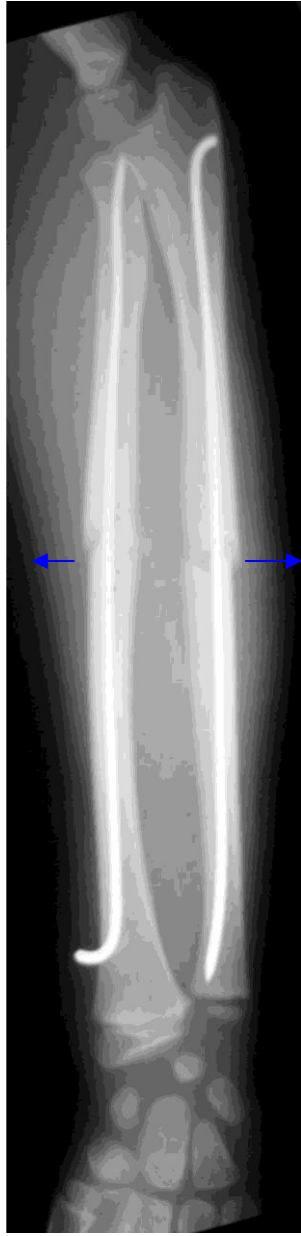
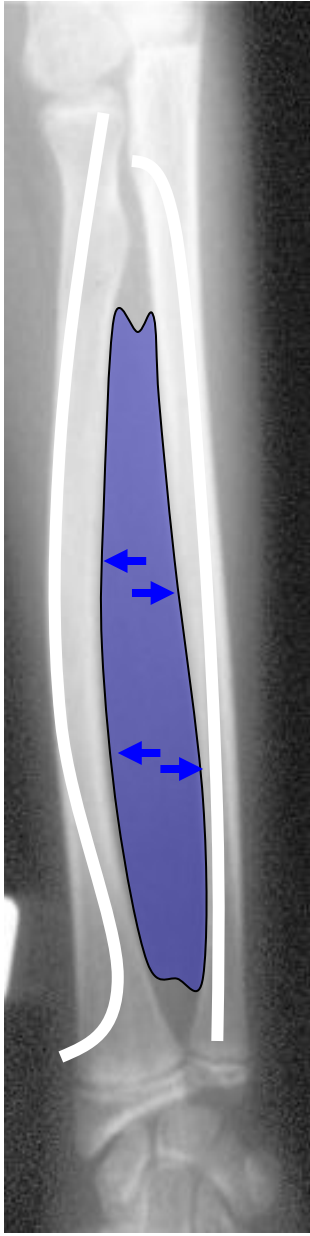


She is not walking well





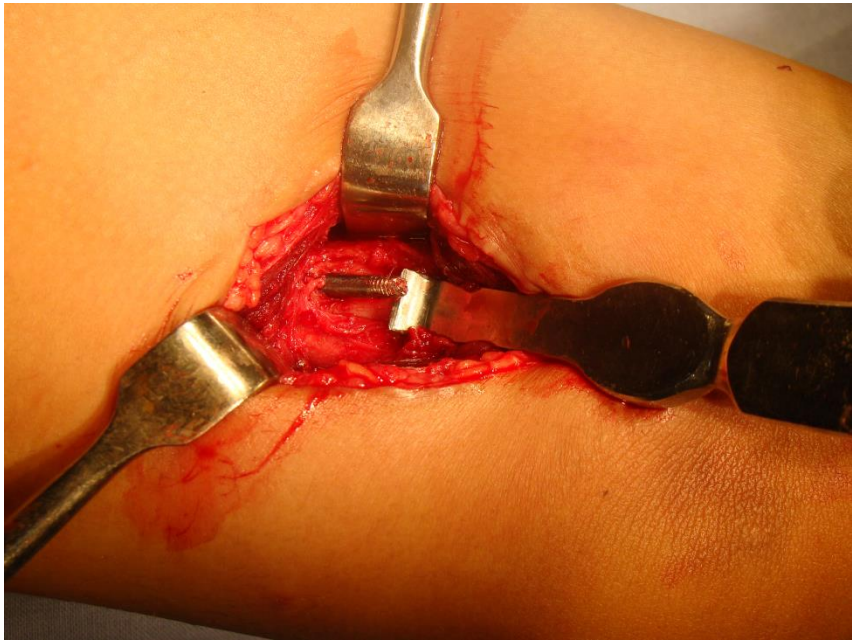




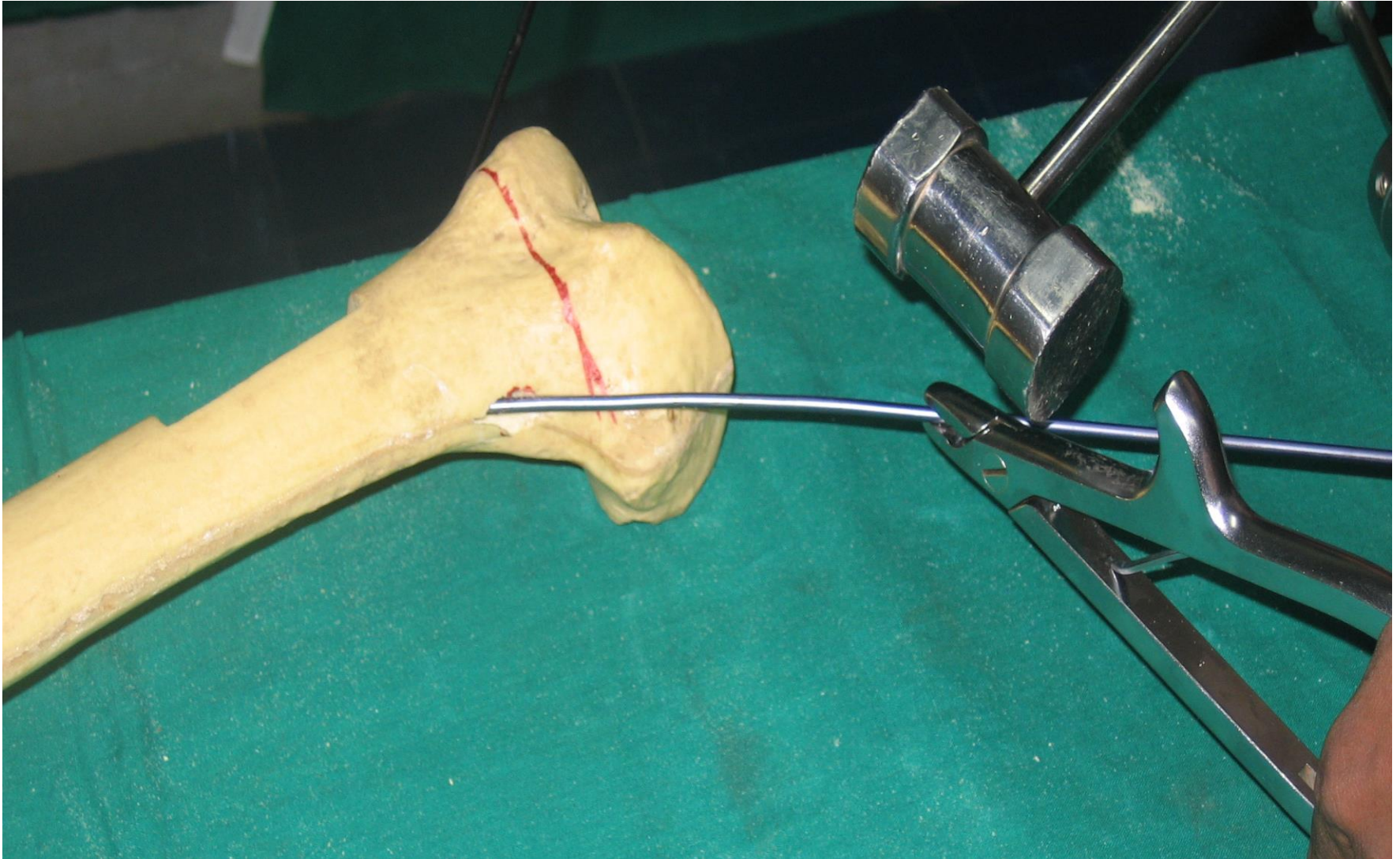
10..Thou shall  
Not take implant  
removal casually



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לא תגנב  
זכור לא תענה  
כבוד לא תחמד



# Extractor



# Sandeep's commandment

Thou shall  
Use other  
methods if not  
confident

