INDICATION AND TREATMENT OF FEMORAL AND TIBIAL FRACTURES IN TKA

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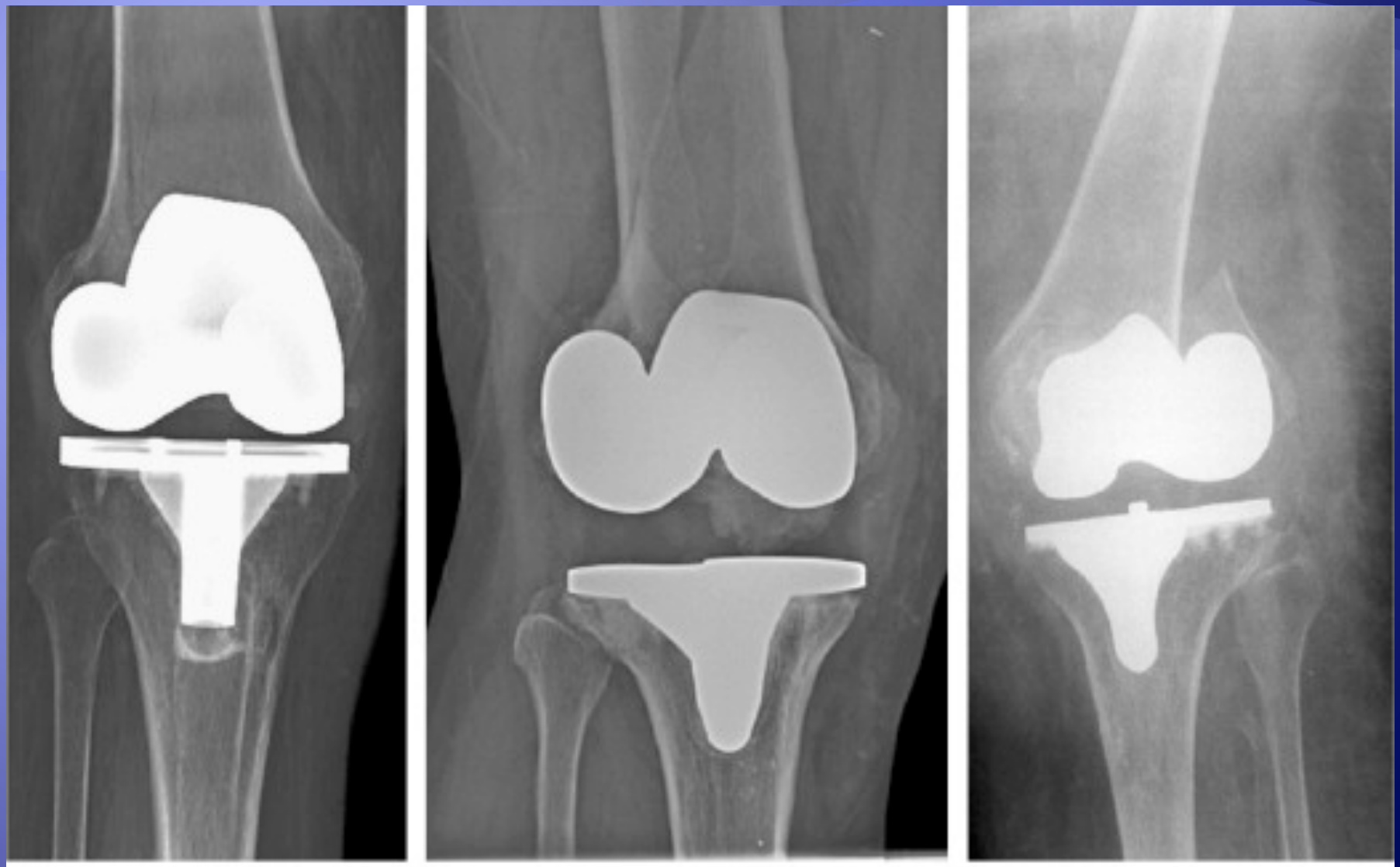
Periprosthetic Femoral Fractures

- Incidence 0.9% primary, 1.7% revision – US data
  Personal series 0/2155
- Risk factors – age, osteoporosis, steroid use, neurological conditions, Rh arthritis
  Notching femur??, Navigation pins

Rorabeck Classification



Type 1 Type 2 Type 3

Indications & Treatment

- All fracture ideally require stabilization
  Type 1 undisplaced fracture in a patient unsuitable for surgery can trial traction or a brace
- CR TKA maybe amenable to retrograde IM nail
- Positioning of the femoral implant important to determine positioning of the IM nail
- An intercondylar distance of >1mm the nail diameter is required

IM Nail - long

IM Nail – Short – Stress riser??

Treatment – LISS plate

- Locked distal plates such as the LISS plate are useful in osteoporotic bone, more distal fractures, and situations in which the femoral component does not allow passage of a nail.
- Lateral approach
  Open reduction of fracture
  Percutaneous proximal screw placement under II guidance

LISS plate fixation

Results

- Biomechanical study
  Comput Methods Biomech Biomed Engin. 2011
  The probabilistic analysis found the locking plate fixation to have a higher probability of fracture than the IM nail fixation under the applied loading conditions
  Locking plate 21.8% versus IM nail 0.019%

Results – Systematic Review

- Herrera et al Acta Orthop 2008

Nonunion rate RIMN 1.5% cf 5.3% for LP

Secondary procedure 4.6% RIMN group cf 8.8% LP

- Meneghini et al J Arthroplasty 2014

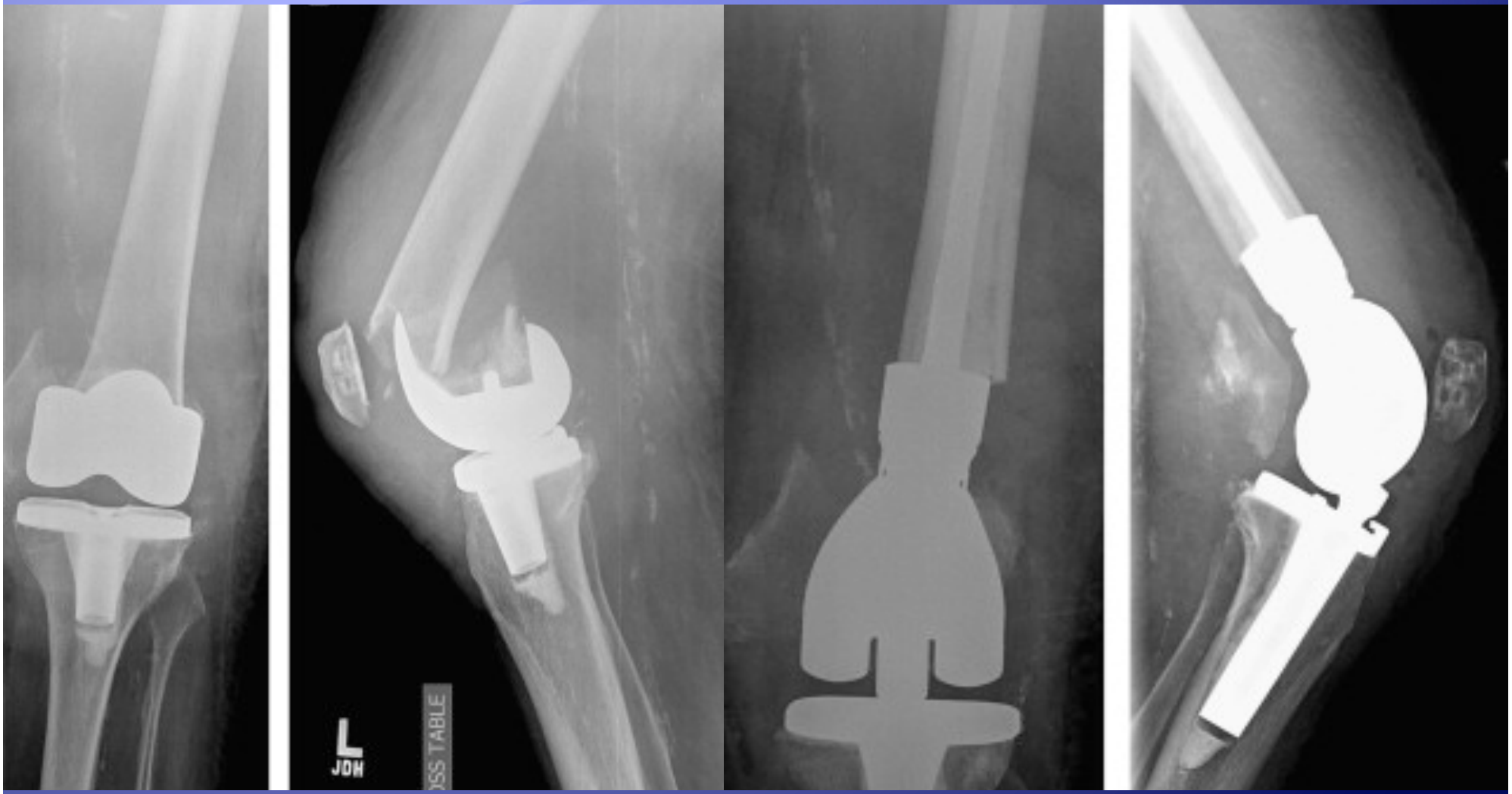
Nonunion rate to be 9% RIMN cf 19% LP
Despite this difference, the RIMN group showed a significantly higher malunion rate (11% vs 9% for LP)

Non union LISS plate??

Distal Femoral Replacement

- Indications are :
  - Significant comminution and or osteoporosis
  - Fracture too distal to use multiple screw insertion
  - Loose femoral component
  - Instability
- Enables rapid recovery with early mobilization and weight-bearing
- No union issues

Distal Femoral Replacement



Comparative Studies

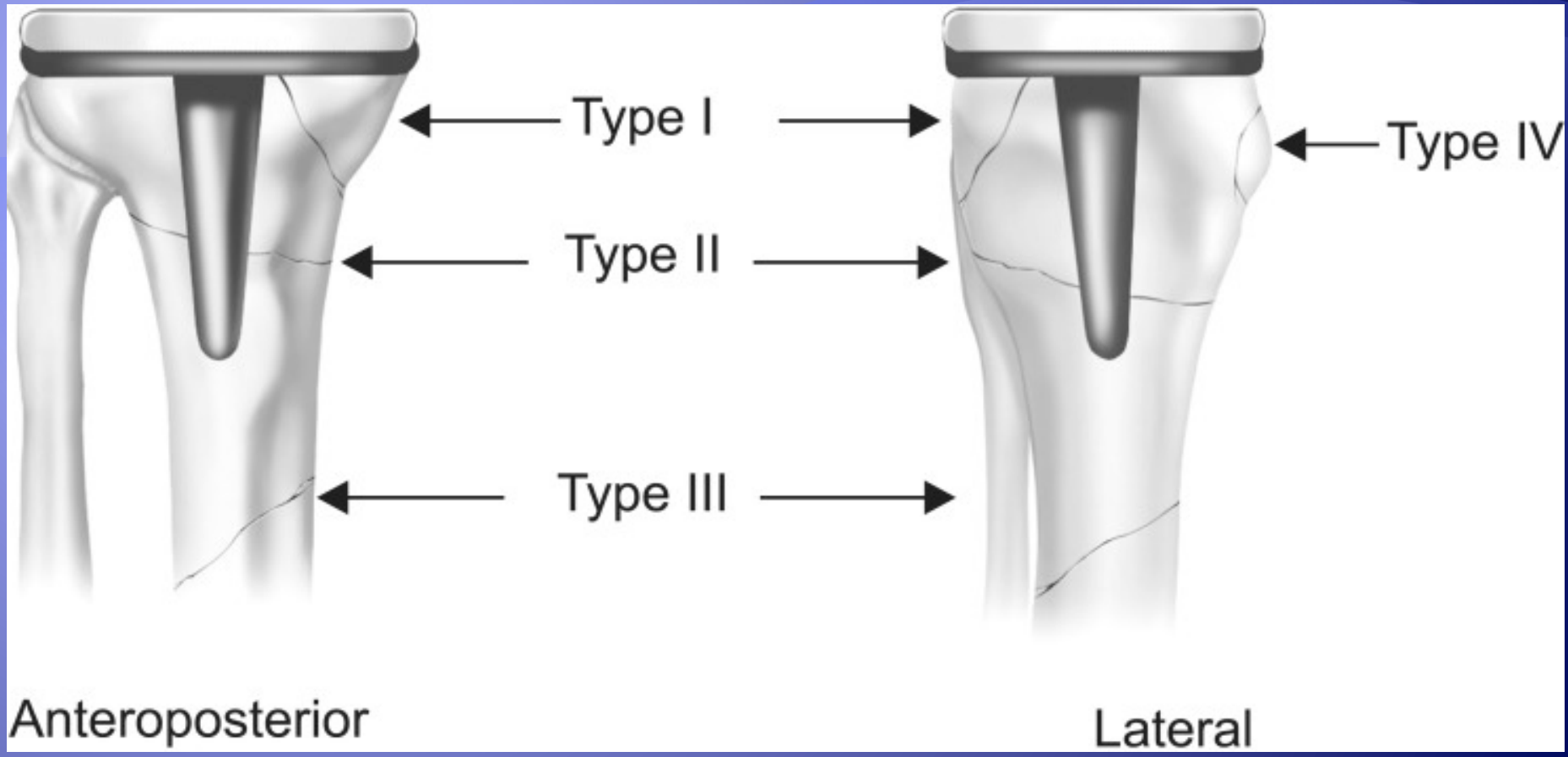
- Primary versus secondary distal femoral arthroplasty for treatment of total knee arthroplasty periprosthetic femur fractures. Chen et al J Arthroplasty 2013
- There were significantly more surgical procedures for ORIF revision to DFA compared to primary DFA
- Primary reconstruction via ORIF is beneficial for preserving bone stock, but primary DFA may be preferred in osteopenic patients, or those at high risk for nonunion

Tibial Periprosthetic Fractures

- Incidence of 0.4%-1.7%
  Personal series 3/2155 – 0.1% - Two pin site #'s

- Aetiology - usually trauma
  Mal-alignment can lead to a stress fracture
  Pin site fractures

Tibial Plateau Classification

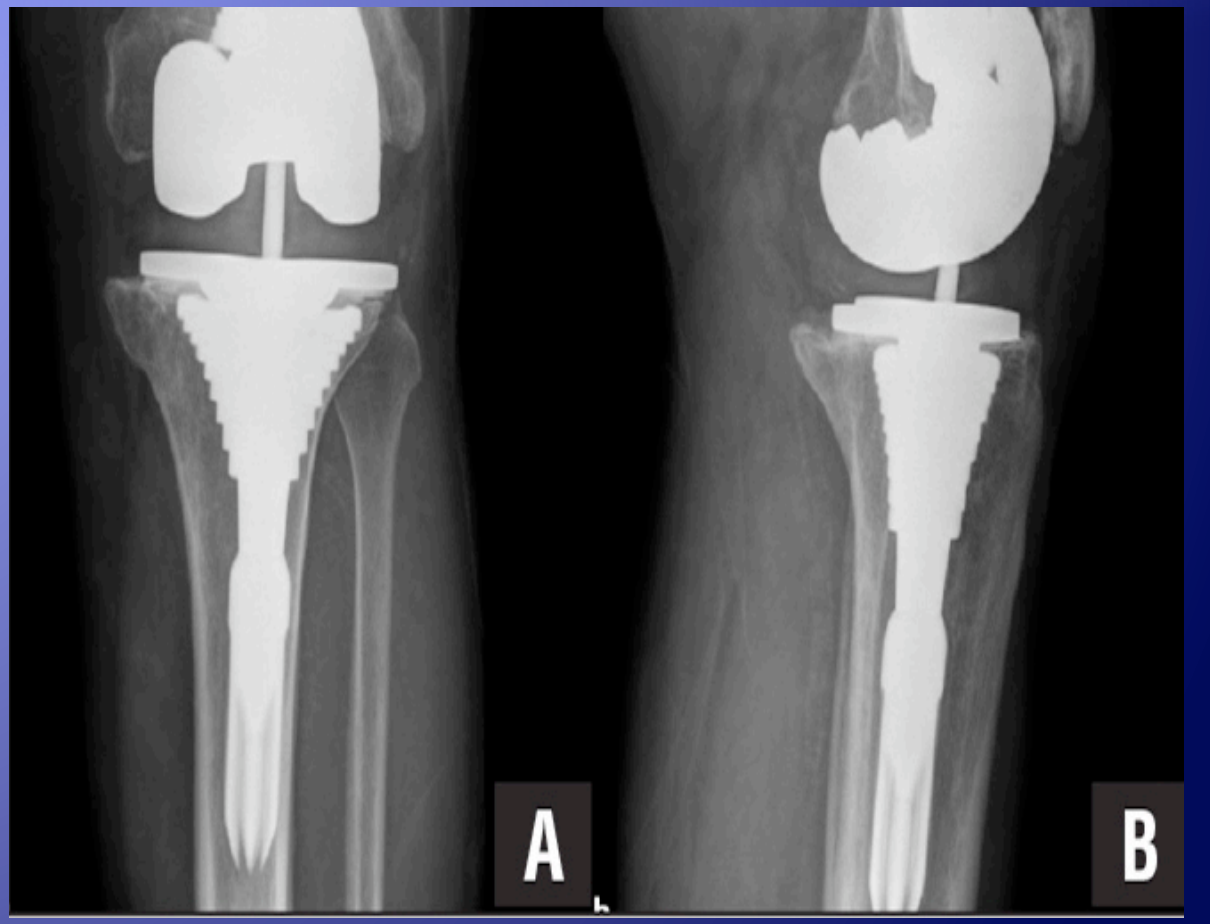


Type A	Stable Prosthesis
Type B	Unstable Prosthesis
Type C	Intraoperative Fracture

Treatment

- Determined by implant loosening
- If loose revise with long stem distal to the fracture with locked plate
- If implant stable – locked plate

Unstable TKA



Stable TKA Locked plate

Tibial Pin Site Stress