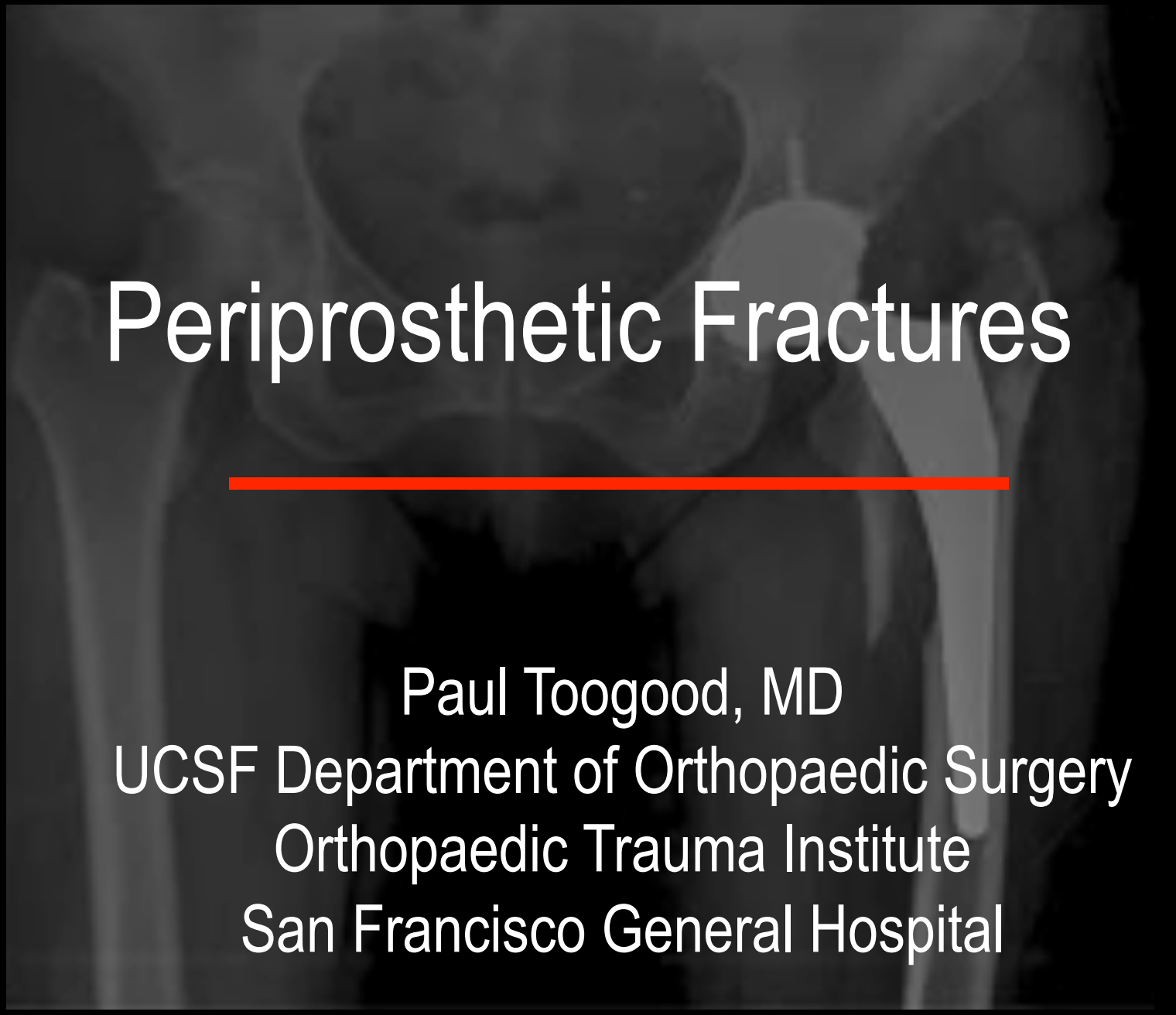


Periprosthetic Fractures

Paul Toogood, MD
UCSF Department of Orthopaedic Surgery
Orthopaedic Trauma Institute
San Francisco General Hospital

Disclosures

- None

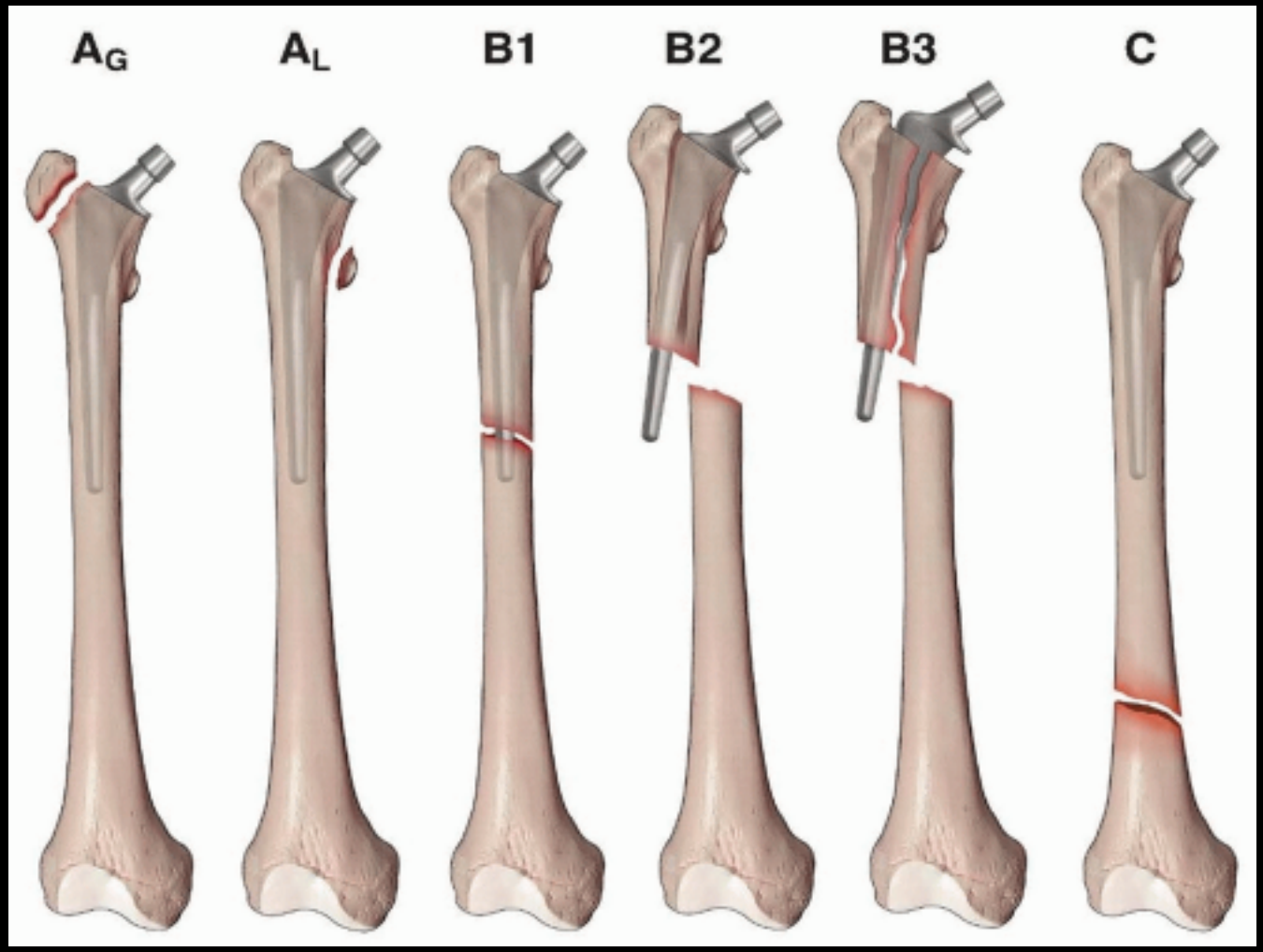
Outline

- Definition: What's a periprosthetic fx?
- Why do we fix them?
- How do we fix them?
- How do we choose amongst our tools?
- What are the outcomes?

Definition: What's a Periprosthetic Fracture?

- Peri → Around
- Prosthetic → Implant

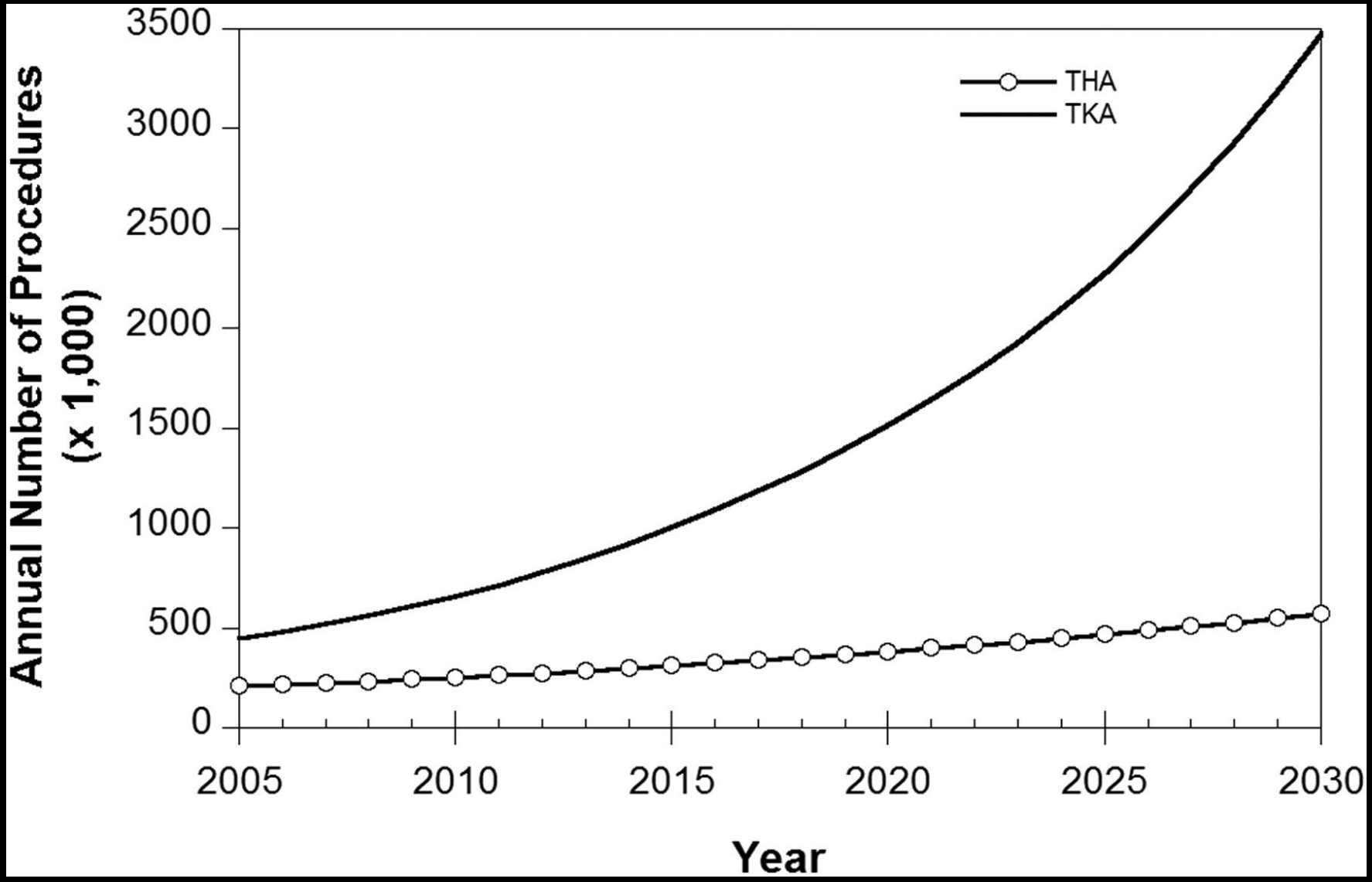
Around?



Prosthetic?

Prosthetic or Implant?

Is this common?



Definition: What's a periprosthetic fracture?

- Large group of increasingly common diagnoses, each with its own natural history, surgical treatments/challenges, and prognoses.

Why do we “fix” periprosthetic fractures

- Quality of life
  - Preserve the function of limb
    - Restore anatomy
      - Length, alignment, rotation
    - Return to weight bearing
    - Joint motion

Why do we “fix” periprosthetic fractures

- Quantity of life
  - Complications of immobilization:
    - Pneumonia
    - Urinary Tract Infections
    - Bed Sores
    - Deconditioning

Why do we “fix” periprosthetic fractures?

- Quantity of life
  - O
  - O
  - B

  - W
  - B
  - A
  - T

How do we fix periprosthetic fractures?

Internal Fixation

Revision Arthroplasty

Internal Fixation

- Goals of Treatment:
  - Reduce the fracture
    - Restore patient's own anatomy
  - Stable Fixation
    - Place an internal implant that will maintain the reduction
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

  - Fracture healing around old prosthesis

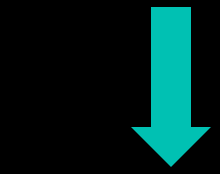
Internal Fixation

- Goals of Treatment:
  - Reduce the fracture
    - Restore patient's own anatomy
  - Stable Fixation
    - Place an internal implant that will maintain the reduction
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

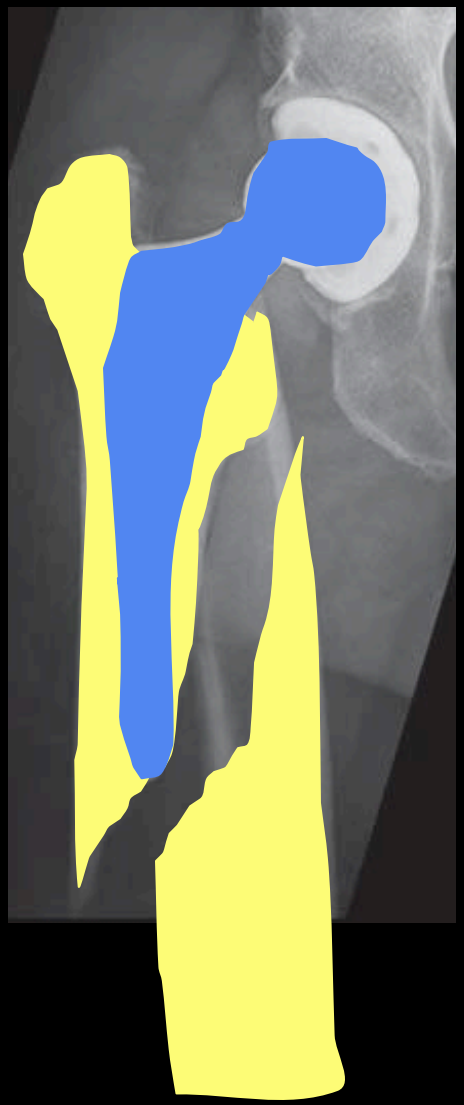
- Fracture healing around old prosthesis

Internal Fixation

- Goals of Treatment:
  - Reduce the fracture
    - Restore patient's own anatomy
  - Stable Fixation
    - Place an internal implant that will maintain the reduction
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

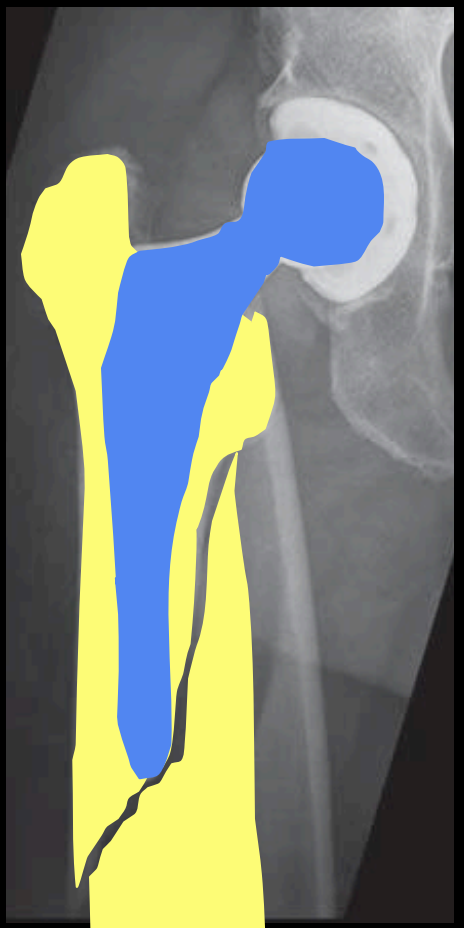


  - Fracture healing around old prosthesis



Internal Fixation

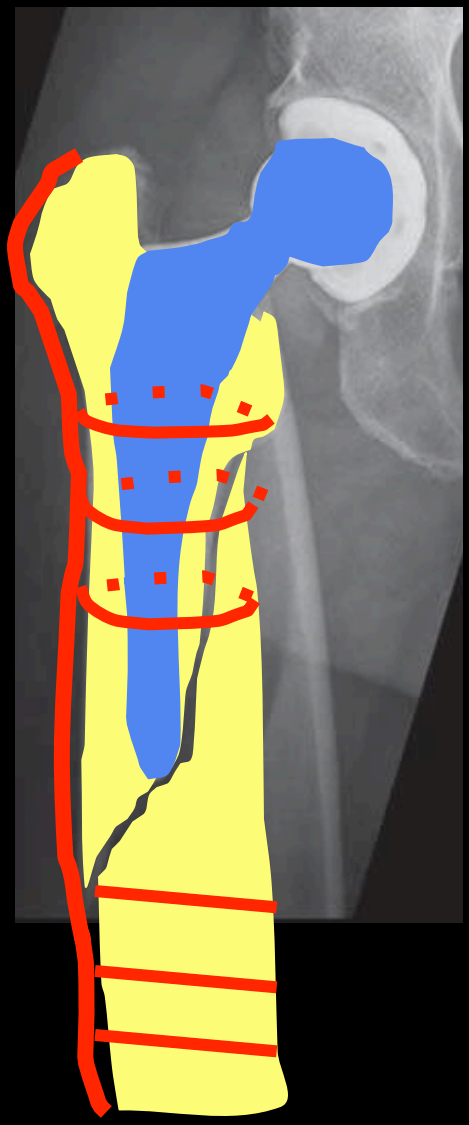
- Goals of Treatment:
  - Reduce the fracture
    - Restore patient's own anatomy
  - Stable Fixation
    - Place an internal implant that will maintain the reduction
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional



  - Fracture healing around old prosthesis

Internal Fixation

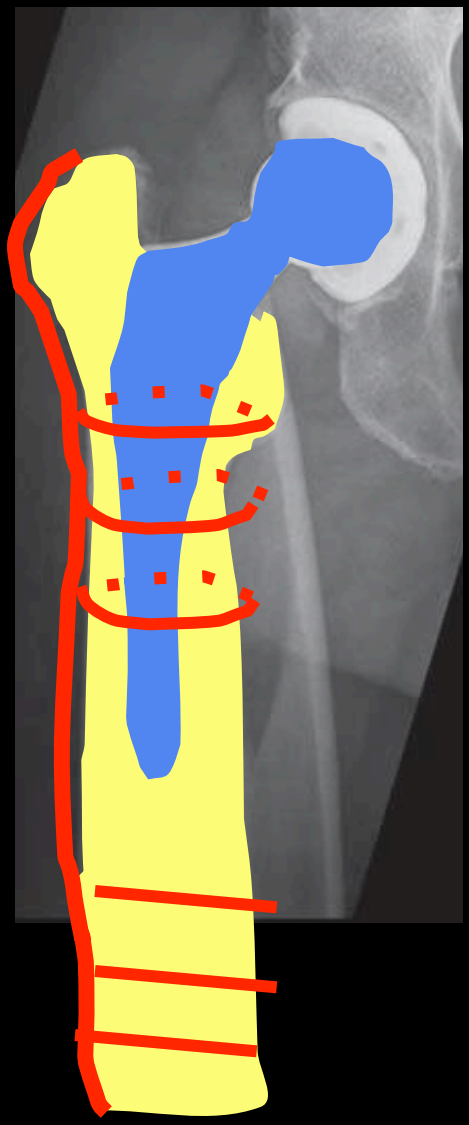
- Goals of Treatment:
  - Reduce the fracture
    - Restore patient's own anatomy
  - Stable Fixation
    - Place an internal implant that will maintain the reduction
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional



- Fracture healing around old prosthesis

Internal Fixation

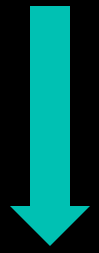
- Goals of Treatment:
  - Reduce the fracture
    - Restore patient's own anatomy
  - Stable Fixation
    - Place an internal implant that will maintain the reduction
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional



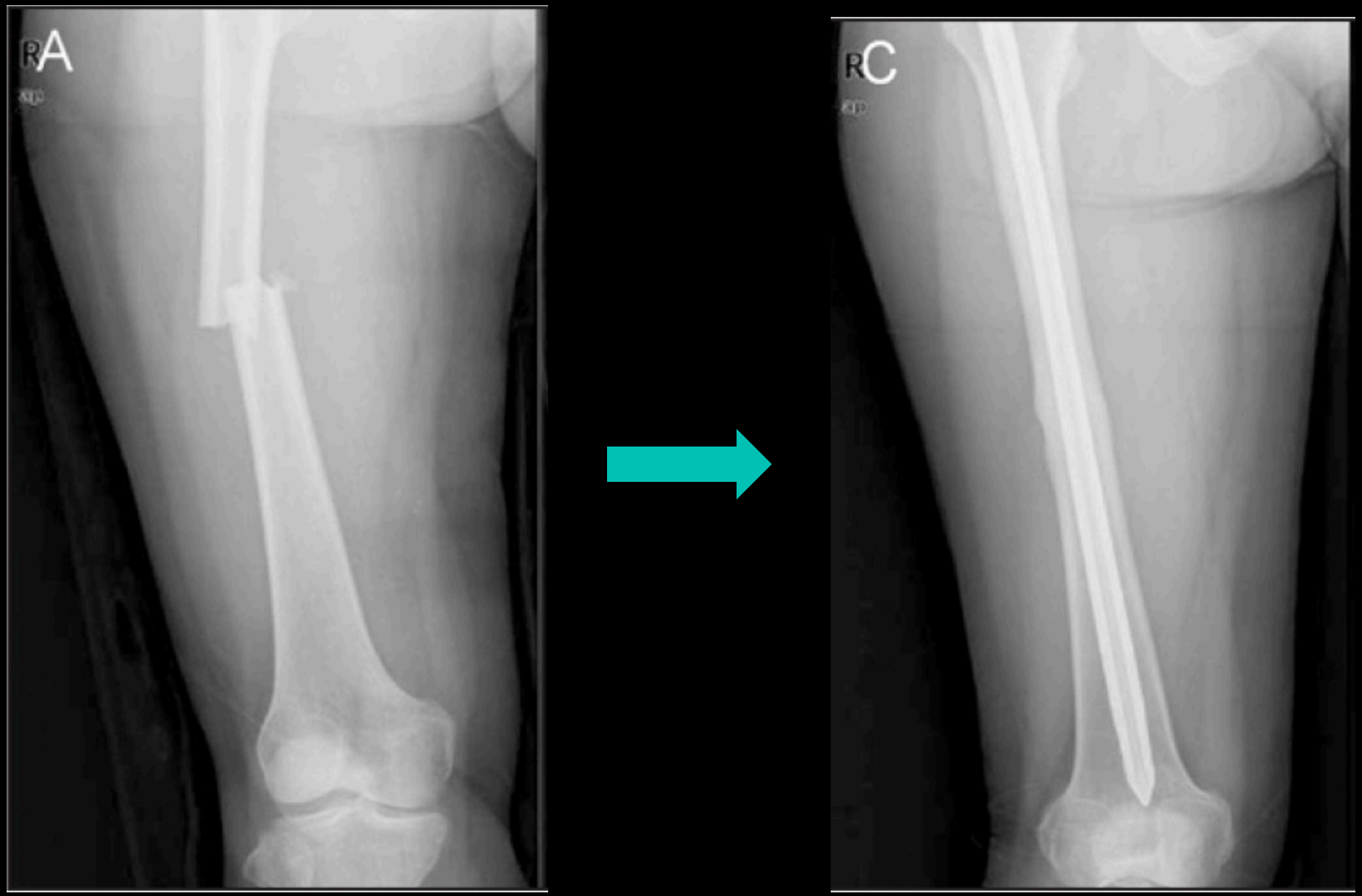
- Fracture healing around old prosthesis

Internal Fixation: Challenges

- Bone quality & quantity
- Implant takes up space



- Less robust fixation than non-periprosthetic counter parts… often not allowing weight bearing until fracture healing


RA
RC

Internal Fixation: Pros and Cons

- Pros
  - Maintain native bone
- Cons
  - Relatively poor fixation does not allow immediate weight bearing
  - Large surgery
  - Unprepared, frail patient

Revision Arthroplasty

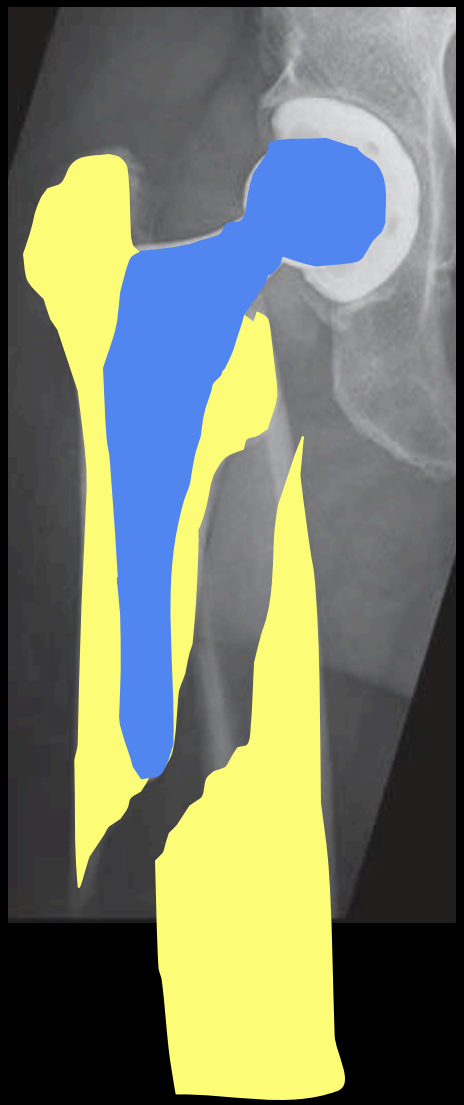
- Goals of Treatment:
  - Bypass or Remove the fractured bone
  - Stable implant
    - Fixed to bone unaffected by fracture
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

  - New, functioning prosthesis +/- fracture healing

Revision Arthroplasty

- Goals of Treatment:
  - Bypass or Remove the fractured bone
  - Stable implant
    - Fixed to bone unaffected by fracture
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

  - New, functioning prosthesis +/- fracture healing



Revision Arthroplasty

- Goals of Treatment:
  - Bypass or Remove the fractured bone
  - Stable implant
    - Fixed to bone unaffected by fracture
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

  - New, functioning prosthesis +/- fracture healing

Revision Arthroplasty

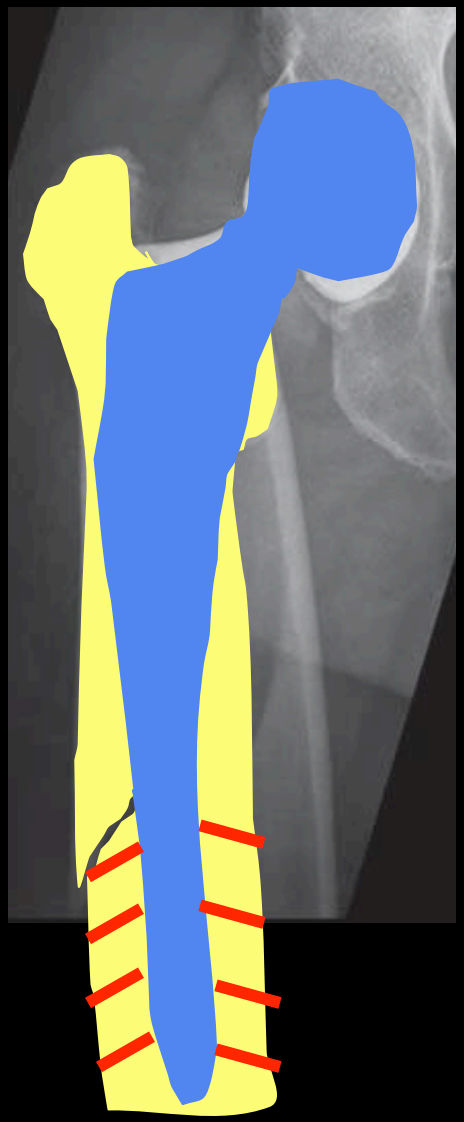
- Goals of Treatment:
  - Bypass or Remove the fractured bone
  - Stable implant
    - Fixed to bone unaffected by fracture
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

  - New, functioning prosthesis +/- fracture healing

Revision Arthroplasty

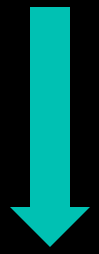
- Goals of Treatment:
  - Bypass or Remove the fractured bone
  - Stable implant
    - Fixed to bone unaffected by fracture
  - Limit soft tissue injury
    - Maintain the blood supply to the bone
    - Keep surrounding tissues healthy and functional

  - New, functioning prosthesis +/- fracture healing



Revision Arthroplasty: Challenges

- Bone quality & quantity
- Implant removal
- Reliance on remaining bone above/below fracture



- Allows immediate weight bearing, but at the cost of bypassing or removing fracture bone

Revision Arthroplasty: Pros and Cons

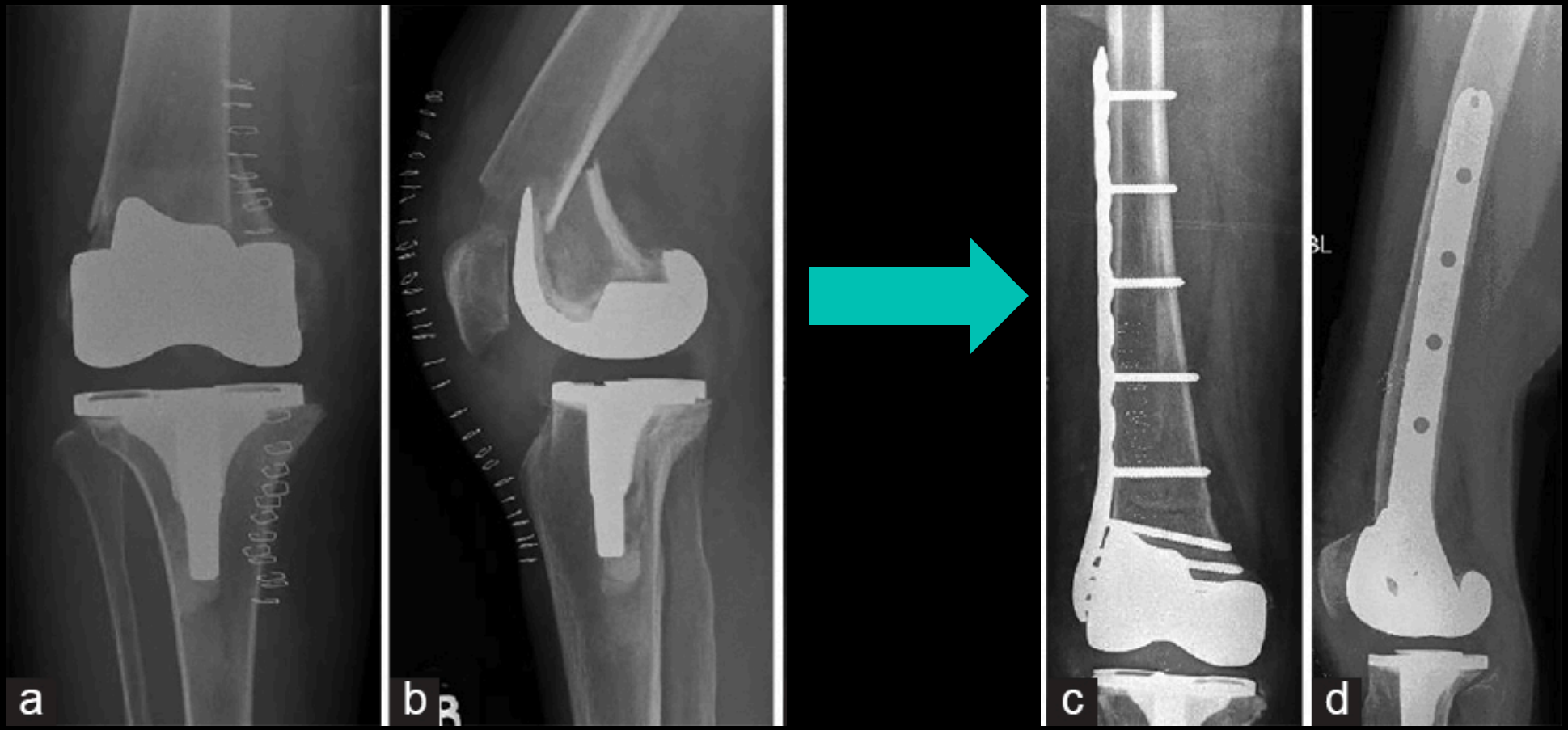
- Pros
  - Immediate fixation above/ below fracture site does allow immediate weight bearing
- Cons
  - Loss of native bone stock, soft tissue attachments
  - Large surgery
  - Unprepared patient

How do we chose amongst our tools?

- 1) Does the implant remain well fixed to native bone?

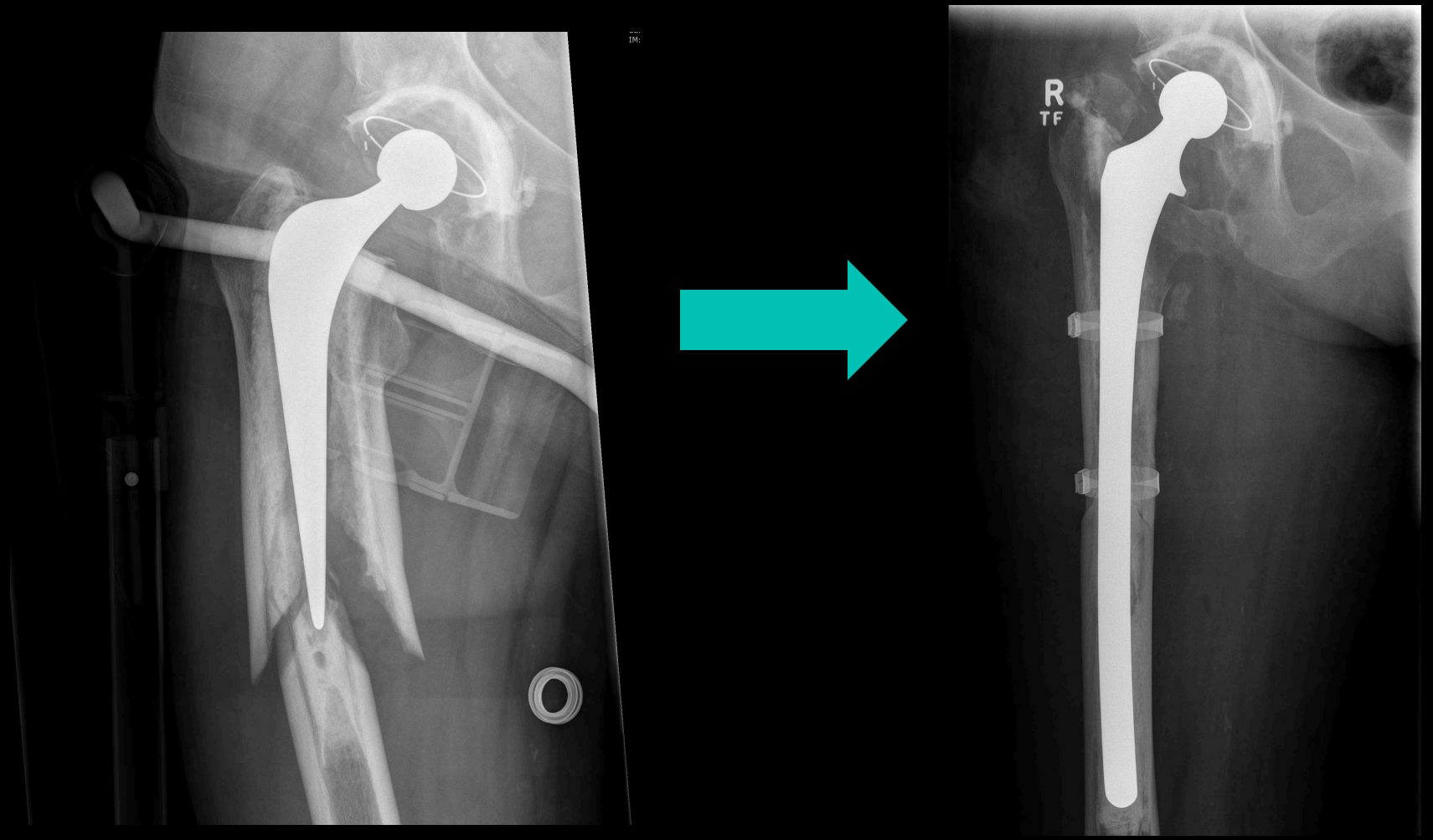
How do we chose amongst our tools?

- 1) Does the implant remain well fixed to native bone? YES



How do we chose amongst our tools?

- 1) Does the implant remain well fixed to native bone? NO

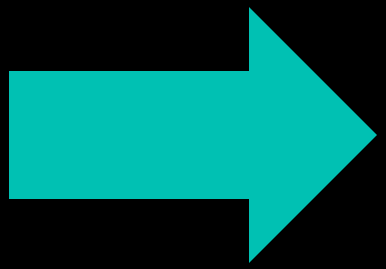


How do we chose amongst our tools?

- 2) What is the quality of the remaining bone?

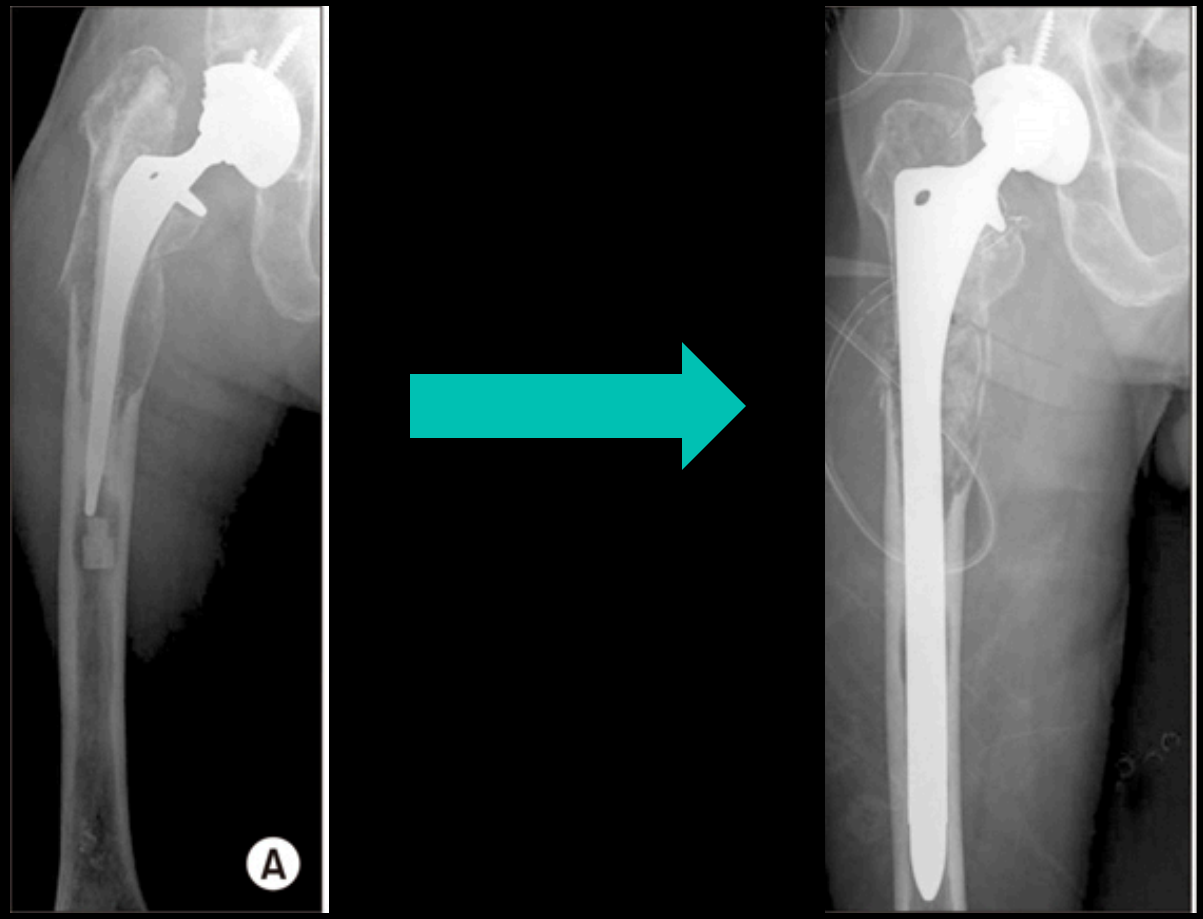
How do we chose amongst our tools?

- 2) What is the quality of the remaining bone? GOOD



How do we chose amongst our tools?

- 2) What is the quality of the remaining bone? BAD

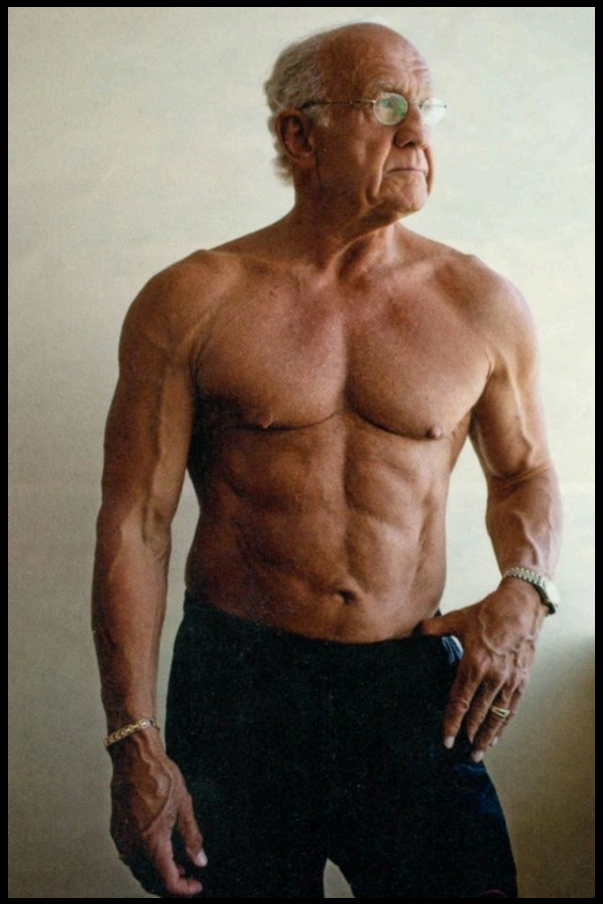


How do we chose amongst our tools?

- 3) What are the weight bearing needs of the patient?

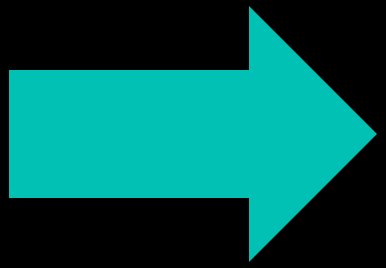
How do we chose amongst our tools?

- 3) What are the weight bearing needs of the patient?
  - Ok to be non-weight bearing and uses crutches/walker for 3 mo



How do we chose amongst our tools?

- 3) What are the weight bearing needs of the patient?
  - Ok to be non-weight bearing and uses crutches/walker for 3 mo

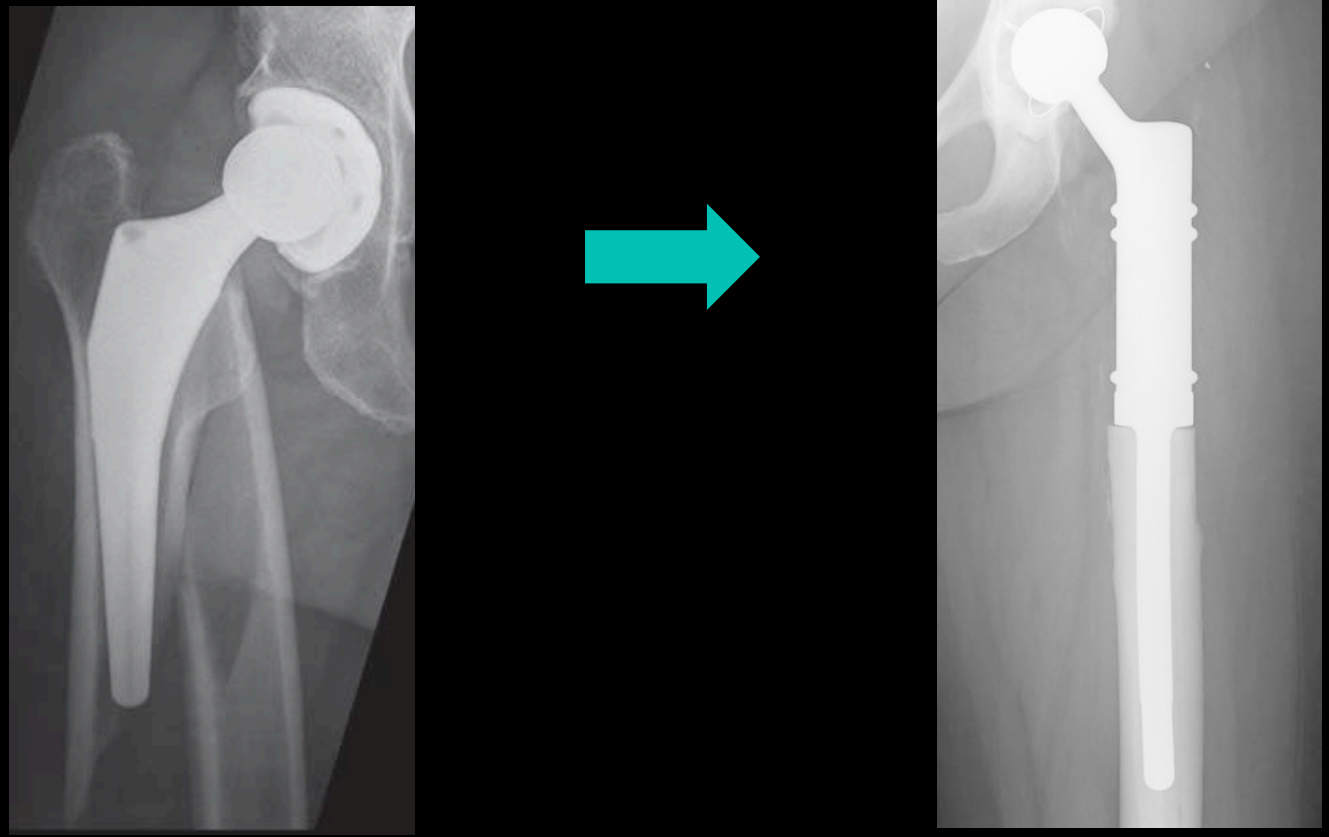


How do we chose amongst our tools?

- 3) What are the weight bearing needs of the patient?
  - Needs to weight bear immediately

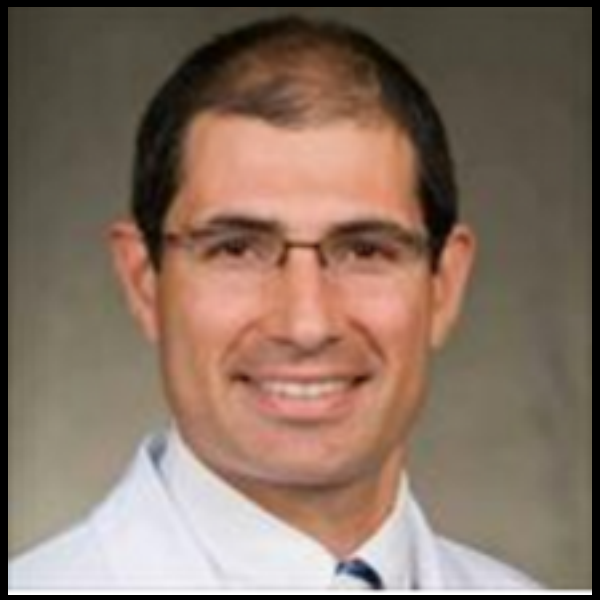
How do we chose amongst our tools?

- 3) What are the weight bearing needs of the patient?
  - Needs to weight bear immediately



Who does these procedures?

- Fracture → Trauma Surgeon



- Prosthesis → Joint Replacement Surgeon


UCSF Medical Center MAIN ENTRANCE
505 Parnassus Avenue
UCSF Medical Center 505 PARNASSUS AVENUE

What are the outcomes?

- Complications:
  - Bleeding
  - Infection
  - Blood clots
  - Dislocations
  - Non-unions
  - Mal-unions
  - Neuro-vascular injury

  - Loss of independence
    - 21% d/c immediately home
  - Death
    - 5% in hospital mortality

Summary

- Definition: What's a "periprosthetic fracture"?
  - Fracture around an implant
  - Large group of diagnoses
- Why do we fix them?
  - Quantity of life
  - Quality of life
- How do we fix them?
  - Internal Fixation
  - Revision Arthroplasty
- How do we choose amongst our tools?
  - Implant fixed to bone
  - Bone quality/quantity
  - Weight bearing needs of the patient
  - Team approach
- What are the outcomes?
  - High rates of complications, loss of independence, mortality


Orthopaedic Trauma Institute
UCSF + SAN FRANCISCO GENERAL HOSPITAL

Thank You