ENDSTAGE MANAGEMENT OF DISTAL FEMUR PERIPROSTHETIC FRACTURES

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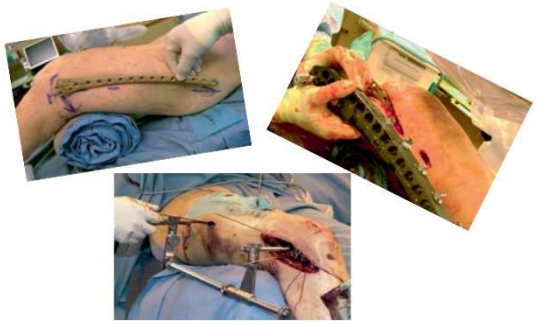
Hospitals view of my practice…

"Mrs. Smith you have a very difficult problem,
but I know a colleague
(Translated: IDIOT)
who may be willing to take this on."

What we are not going to talk about:



ENDSTAGE RECONSTRUCTION (ESR)

- **ESR DEFINITION:**
  Joint replacement surgery that cannot be reconstructed by ordinary means utilizing standard revision off-the-shelf products.
- Typically require segmental Limb Salvage components that traditionally have been reserved for tumor surgery.

When Is End Stage Reconstruction Needed?

- Massive osteolysis
- Trauma
- Post-infection
- Failed “conservative” RevTKA
- Peri-prosthetic fractures

ESR NUMBERS: KNEE

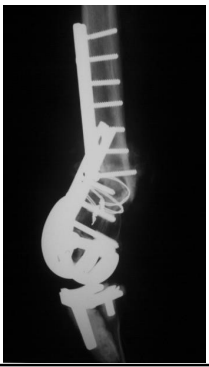
- Bulk of ESR done in Western Europe (70%)
- USA (15%)

PATIENT PROFILE

- Age (varies)
- Post-traumatic
- Deficient bone stock
- Deficient skin envelope
- Multiple prior surgeries

PATIENT PROFILE

- Multiple complicating medical problems
- Prior peri-op complications
- Limited community ambulator

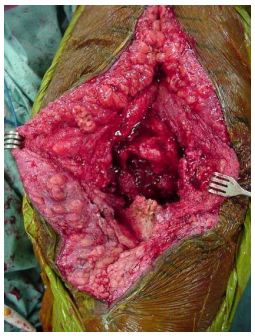


Pre-Op Work Up

- X-ray:
  - Full length films
  - Joint specific films
  - CT scan
  - Bone scan?
  - WBC scan?
  - Mag marker films (Custom)

Pre-Op Work Up

- Do not do the initial Infection work-up **intra-operatively**



WORK UP

- Adequate history
- Infection history
  - CRP, ESR, CBC
  - Synovasure
  - DNA
- Physical evaluation
  - Inspect skin/wound site
  - Range of motion/stability
  - Tight scar envelope?

Plastic Surgeons Can Be Our Friends

- Pre-op consult:
  - Pre-op flap/graft
  - Tissue expander
  - Coordinate schedules so plastics can close wound

- Intra-op consult:
  - May not be able to get to you
  - *"I am busy…"*

Patient Selection for ESR

- Diffuse peri-articular segmental bone loss
- Infection free
- Technical problems not suitable for standard revision components
- Completed rigorous pre-op medical clearance
- No other suitable reconstructive option

Use of Limb Salvage Prosthetic Components

- Avoid "dead bone" bulk graft
  - Less predictable outcome
- Cemented vs. Cementless
  - Bone quality dependent
  - Age/Health
  - Ambulatory status
- Rotating Hinge knee
- Total Femur??
  - Constrained hip vs. Dual Mobility

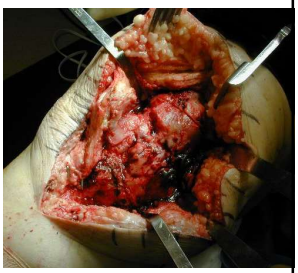
ESR Surgical Technique

Skin Technique/Dissection

- Avoid skin islands
- Make skin incision for best exposure
- Keep closure in mind
- Develop best/forgiving tissue planes possible

Extensor Mechanism: BEWARE

- Split quad tendon centrally
- Resect ALL fibrotic tissue
  - Increases pliability of tissues
- Protect Patellar tendon/Ext Mechanism
- Rare to require tubercle osteotomy

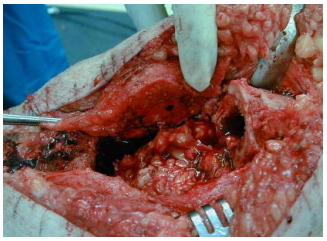


Extensor Mechanism: BEWARE

- Repair (Brown/Hansen)
  - Marlex graft
  - Incorporate into the remaining tissue sleeve
  - Protect x 3 months
  - Slow mobilization (Long leg hinged brace)
  - Steer clear of PT

Bone Technique

- Perpendicular resection to long bone axis
- Standard tibial prep for stemmed component
- Patellar resurfacing if necessary



Implant Requirements

- Ease of use/interchangeability of segments
- Smaller sized femoral components
  - Ease of capsular closure
- Cement/Cementless tibial side
- Cement/Cementless femoral stem
- Ability to convert to Total femur

Implants: What's Out and What's In

- Out:
  - Cylindrical stems
  - Cement only IM Stems

*Always exceptions…

- In:
  - Cones and Sleeves
  - Wagner type IM Stems

Implants: What's **Out**

- Out:
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Implants: What's **In**

- In:
  - Cones and Sleeves
  - Wagner type IM Stems

Surgical Steps Following Implantation

- Fastidious closure!
- Close down dead space if possible
- Deep drain(s)
- If wound bed is highly porous:
  - Ethicon "*SNOW*"
  - Thrombin spray
  - Tisseel

Surgical Steps Following Implantation

- TXA (at close of case)
- Post Closure Long leg anti-embolic stockings
- Foot pumps
- Drains (maintain longer than standard times)
- If Plastics performs closure they should dictate mobilization

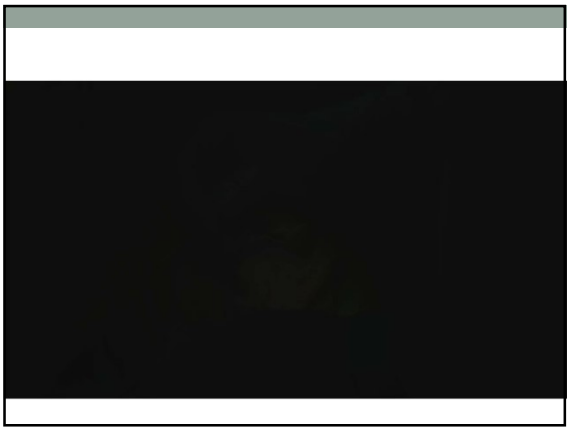
(Flaps, wound vacs, skin grafts)

Caveat re: Implantation

- If infection present:
  - **One Stage**
    or
  - **Two Stage**
  - Consider antibiotic spacer
  - Articulated antibiotic implant
  - Temporary fusion (>6cm)

Clinical Case Presentation

- 66 yr old female
- Sudden onset deformity & pain
- Prior TKA 22 years ago



END STAGE RECONSTRUCTION

Conclusion:

- Distal femoral replacement is a viable option for endstage reconstruction vs. ORIF
- New options allow for reliable cementless fixation
- Good Luck!


BEAT NAVY