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Cemented Stems in Revision Cases
Focus on the Knee

Tibia has a funny shape

- Stems can be used depending on the extent of offset
- Hicks et al
  - Significant variability/ location of the tibial canal relative to the tibial plateau
  - Intramedullary canal center was usually anterior and medial to the tibial plateau

The anatomy of the tibial intramedullary canal.
Hicks CA, Noble P, Tullos H
Clin Orthop Relat Res. 1995 Dec; (321):111-6.

Tibia has a funny shape

- Tang et al.
  - Described that the axis of the tibial shaft is located anterolateral to the center of the tibial plateau in Asian population
  - These studies highlight need for offset stems of the tibial component in revision TKA
  - Downside … additional equipment/ additional time/ potentially unforgiving

The offset of the tibial shaft from the tibial plateau in Chinese people.
Tang Q, Zhou Y, Yang D, Xu H, Liu Q
J Bone Joint Surg Am. 2010 Aug 18; 92(10):1981-7.

How long should the uncemented stem be?

- Recommend
  - 4 cm of diaphyseal engagement for press-fit stems
- That can be challenging …
  - narrow tibia or a small patient

Clinical & radiographic outcomes of cemented vs. diaphyseal engaging cementless stems in aseptic revision TKA.
Gililland JM, Gaffney CJ, Odum SM, Fehring TK, Peters CL, Beaver WB
J Arthroplasty. 2014 Sep; 29(9 Suppl):224-8.

Press fit problems

- A long stem can force articular components into suboptimal position
- Gobba et al.
  - 120 mm tibial stem will force the tibial component into an excessively valgus position
  - 200 mm tibial stem will often force the tibial component into a posteromedial position above the tibial surface
- Mild to moderate valgus bowing of the tibial canal is not uncommon
  >50% possibly leading to valgus malalignment
- Anatomic conflict between the tibial mechanical axis and intramedullary canal can exist/alignment and tray placement implications

Tibial Stems in Revision Total Knee Arthroplasty: Is There an Anatomic Conflict? *Gobba MS, Chan N, Patel R, Noble PC, Incavo SJ*
J Arthroplasty. 2015 Sep; 30(9 Suppl):86-9.

Tried and True

- Murray PB, Rand JA, Hanssen AD. Cemented long-stem revision total knee arthroplasty. Clin Orthop Relat Res. 1994;309: 116–123.
  - Average FU 58 Months
- Whaley AL, Trousdale RT, Rand JA, Hanssen AD. Cemented long-stem revision total knee arthroplasty. J Arthroplasty. 2003; 18:592–599.
  - 95% Free from revision up to 11 years

Clin Orthop Relat Res. 2014 Jan;472(1):206-11. Are cementless stems more durable than cemented stems in two-stage revisions of infected total knee arthroplasties?

- They work equally well and survive
- Re revision for recurrent sepsis
  - 10 of the 51 patients in the cemented stem group
- Re revision for recurrent sepsis
  - 15 of 63 uncemented stems were re-revised for sepsis
- May be from the antibiotics?

J Bone Joint Surg Am. 2009 Mar 1;91(3):628-33.
Antibiotic-impregnated cement in revision total knee arthroplasty. A prospective cohort study of one hundred and eighty-three knees.

- 1993 to 2004
- 183 first-time revision total knee arthroplasties were performed with fixation of all components with cement/ FU 1 yr
- Knees divided randomly /two groups to evaluate vancomycin-impregnated cement /prevention of postoperative infection
- No deep infection/ ninety-three knees in Group 2 ABX
- Deep infection/ six (7%) of the ninety knees in Group 1(no ABX)

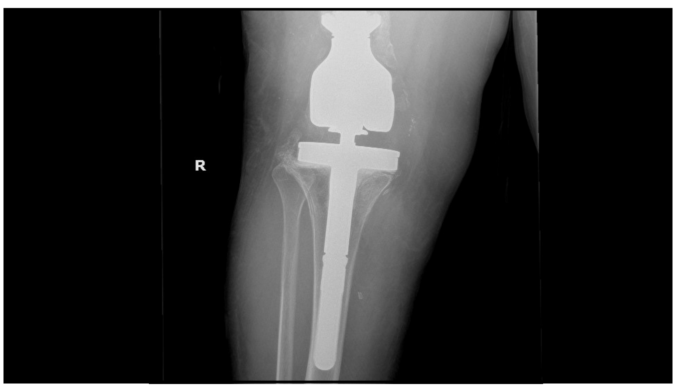
J Bone Joint Surg Am. 2009 Mar 1;91(3):628-33. doi: 10.2106/JBJS.G.01570.
Antibiotic-impregnated cement in revision total knee arthroplasty. A prospective cohort study of one hundred and eighty-three knees.
Chiu FY1, Lin CF.

Cemented Stems

- Antibiotics in the cement
- Don't rely on poor host bone/ its already compromised
- Maybe the best reason to consider cementing the stems
- Meta analysis supporting lower risk of infection in revision knee with antibiotic cement

Press Fit Stems

- End of stem pain
- Intraoperative risks/ fracture
- Possible inconsistencies in the diameters of the stems
- Potential to force the component into suboptimal position
- Femoral canal bowing
- Potential for bone loss if you had to remove a long well fixed stem
- Discriminatory Practices!!



Cemented Stems

- Easy to use
- Better initial stability
- Potential to utilize antibiotics, potential intramedullary elution following previous infection
- Variable component positioning and sizing
- Useful to negotiate diaphysis bowing
- Can always revise the short cemented stem
- Non Discriminatory care!!

Be Careful in your choice

Malalignment
Broken tibia
Probably hurts at the bottom
Cant get the femoral component where you want
Discrimination!!
Probably going to be infected

Vote for Cement!