

Surgical Technique

Press-fit vs. Cemented knee implants

Orthopedic surgeons select knee implants that require acrylic *bone cement* (polymethylmethacrylate or PMMA) to secure the implant or press-fit knee implants in which bone grows into porous-coated baseplates. Implants that rely on bone integration are now favored in hip implants because cemented fixations may be weaker and subject to loosening. For active and athletic patients, cemented implants are generally not satisfactory because the cement interface may not withstand the shear (side to side) stresses that occur during activities such as golf, racquetball and skiing. Table 1 lists the advantages and disadvantages of implants that rely on either bone ingrowth or bone cement.



Figure 1. Recent knee replacement in 60 year old female nurse. Surgeon elected to cement the three components. Bone demineralization is already observed.



Figure 2. Athletic knee implant in a 53 year old male patient. Bone integration into the three components is a priority.

Table 1. Comparison between implants that rely on either bone ingrowth or bone cement for fixation.

	Advantages	Disadvantages
<i>Bone Ingrowth</i>	<ul style="list-style-type: none"> ➤ Single interface (bone to implant) ➤ Bone ingrowth is stronger bond long term ➤ Infection rate is very, very low ➤ Operation time and expense is reduced ➤ Long term revision typically exchanges poly liners only 	<ul style="list-style-type: none"> ➤ More technically demanding for surgical team ➤ Components are more expensive
<i>Bone cement</i>	<ul style="list-style-type: none"> ➤ Surgical technique is more forgiving ➤ Good track record for non-athletic recipients ➤ Less expensive implants 	<ul style="list-style-type: none"> ➤ High temperatures of bone cement may damage surrounding bone cells ➤ May provoke an immune system response ➤ May loosen over time especially in athletic patients ➤ Small particles of the bone cement may embed in poly, accelerating wear ➤ Long term revisions often require removal of all components and cement

The press-fit surgical technique requires the surgeon to be meticulous in preparing the bone to ensure integration. This exactness results in a glove-like fit between the bone and implant, allowing for bone ingrowth into the implants. This ingrowth results in a strong interface between the bone and implant that is biologically responsive not susceptible to loosening from vigorous activities. Figures 3a and 3b show the precise cutting required for press-fit implants.

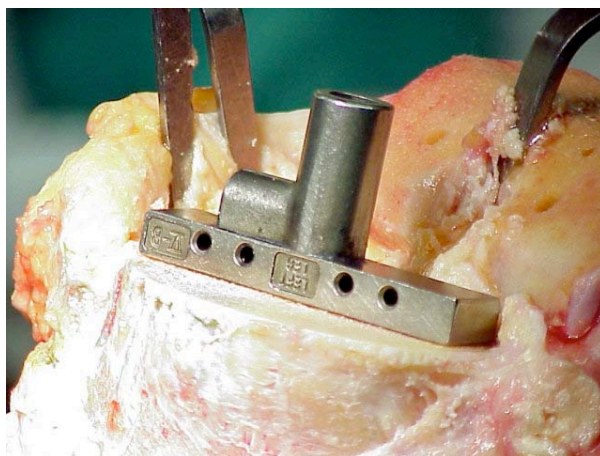


Figure 3a. Flatness of tibial cut



Figure 3b. Side view of femur with implant