



Figure 17-2. AP radiograph of a left THA with an Exeter cemented stem. Stem is a smooth, polished stem with no collar.

Design Differences in Cemented Stems

COLLAR

There are proposed benefits to the use of a collar but there are also proposed disadvantages. The collar aids the surgeon in the placement of the stem. It is far easier to control the depth and varus-valgus position with the collar. Also, the collar potentially allows for greater load transfer to the proximal femur, preventing stress shielding, decreasing proximal stem stresses, diminishing micromotion, and decreasing strain on the proximal cement mantle. Opponents of the collar believe that the collar is not in contact in all cases and can generate wear debris at this contact point. Most of the opponents are also in favor of the use of a smooth, collarless, tapered stem, which allows controlled subsidence in the cement mantle. Adding a collar to a smooth, tapered stem would not make sense for controlled subsidence philosophy. A great example of a collarless, tapered, polished stem is the Exeter stem (Stryker) (Figure 17-2). The collar is usually added to an implant that maintains stability by being contained within the cement mantle. A good example

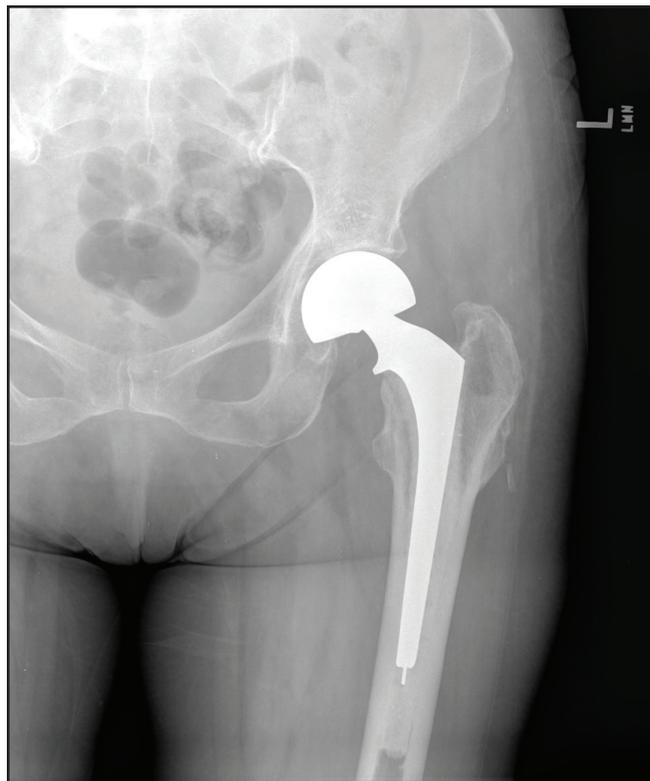


Figure 17-3. AP radiograph of a right hip hemiarthroplasty (bipolar) with an Omnifit EON stem. The stem has a collar.

of a stem with a collar is the Omnifit EON (Stryker) (Figure 17-3).

MATERIAL

The original stems were stainless steel, but the most commonly used materials now are cobalt-chrome (Co-Cr) and titanium. The stiffer stems made from Co-Cr are able to reduce cement stresses. The less stiff titanium stem may be prone to micromotion and this may lead to debonding. The Exeter and Omnifit EON are both made of Co-Cr.

SURFACE TEXTURING

The texturing of the cemented component is a controversial subject. Studies are available to support or refute the use of this technique. Historically, the polished smooth stem has done extremely well. Stems of this design include the Exeter. The stem is smooth and this allows for controlled subsidence within the cement mantle. Other implants have been tried with enhanced surfaces of various types, such as macrotexturing, microtexturing, and precoating. These surface treatments seek to improve the bond between implant and cement. The concern is for cases of debonding. If the textured stem debonds from the cement, this interface can generate a large amount of debris.