Introduction

Resurfacing is a type of hip replacement that conserves bone of the proximal femur and involves preparing the femoral head with special tools that allows for putting a cap on the remaining head. Presently, this femoral head will typically articulate with a metal acetabular component. The use of resurfacing is not a new concept as these prostheses predated the use of stemmed femoral components. They were used commonly in the 1970s with metal-on-polyethylene articulations, but fell out of favor due to high rates of bone resorption and loosening within 5 years [2]. Presently, there has been a resurgence in the use of this technology because of the advent of new metallurgical techniques which have allowed for better metal-on-metal articulations in general. Recently, there have been excellent mid-term results reported with a number of these devices [1, 4, 5]. This review will focus on our use of a minimally invasive approach for resurfacing with a device called the Conserve Plus™ (Wright Medical, Arlington, Tennessee). However, most resurfacings are very similar in design and the techniques that are described in this report can be applied generically to almost all resurfacing devices.

Resurfacing is not a new concept as it has been used as a general standard in total knee replacement. Simply resurfacing the worn joint surfaces has uncommonly been used as a means of a total hip replacement. There are a number of theoretical advantages of resurfacing. An obvious advantage is that it saves bone on the femoral side. This allows the patient to avoid the use of an intramedullary device that is used in standard total hip replacements. Unfortunately, this necessitates a more difficult surgical dislocation and exposure required to prepare the acetabulum because the femoral head is not being sized and can be in the way. In addition, for a truly conservative procedure one would like to take less bone from the acetabulum. Until recently, with newer designs in shells, this has not typically been the case as more acetabular bone stock has been resurfaced.

Other advantages of the resurfacing include possibly better stress transfer to the proximal femur and because of the large femoral head (typically sizes range from 36–54 mm), there has been more range of motion with these replacements than conventional total hips and there has typically been a lower dislocation rate. In one study, the gait mechanics more closely resemble a normal hip than conventional hip replacements [4].

A final advantage is that, when necessary, the revision of the femoral component should be much easier than revising a standard intra-medullary femoral component in a conventional total hip replacement. The contemporary components have an acetabular bearing that removes very little acetabular bone stock and in the event of a revision, there is less inflammatory bone loss of metal-on-metal bearings. In the event of a femoral side failure, the acetabular component can be left in place and mated to a standard femoral component with a large diameter femoral head (Fig. 7.113) [3].

In summary, there are various possible advantages of resurfacing over standard total hip replacements including the preservation of bone stock, the possibly better stress transfer with more range of motion, lower dislocation rates, and perhaps in many cases, an easier revision.

Indications for Resurfacing

The indications for resurfacing hip replacement include most of the indications that are used for any
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Standard hip replacement for any arthritic condition. The indications have gradually been expanded from the use in all forms of primary osteoarthritis, as well as developmental dysplasia of the hip and post-traumatic arthritis, to patients with osteonecrosis and rheumatoid arthritis when there is an adequate bone stock. If any patient, including patients with inflammatory arthritis, have the appearance on X-rays of inadequate bone stock of the femoral head and neck, they would not be candidates for this procedure. Patients have generally been under 55 years of age, but it should be emphasized once again that good bone stock is imperative and that there are certainly patients over this age who have been indicated. Another assessment of bone-stock adequacy can be made through pre-operative DEXA scans.

Although there are no contra-indications, the worst results have been reported in patients who are tall, of female gender, and who have had femoral head cysts greater than 1 cm, which may lead to increased risk for later component failure [1].

Contraindications for resurfacing include patients who obviously have a lack of a femoral head- or neck-bone stock and would not be able to have a resurfacing femoral component. In addition, patients with bone-deficient acetabulae would not be candidates as most resurfacing components on the market do not have screws available for ancillary fixation. As these second generation devices are developed with ancillary fixation aids for the acetabulum, more people with dysplasia or acetabular bone deficiency may be candidates.

Excellent indications for resurfacings include:

- patients who have retained hardware of the proximal femur that would be difficult to remove for a standard stem replacement,
- patients with certain diagnoses that may have a high risk for failure or dislocation in standard total hip replacements (such as sickle-cell disease or chronic alcoholics),
- patients with a proximal femoral deformity which makes putting a standard-stem prosthesis difficult or impossible to place (Fig. 7.114, 7.115).

Fig. 7.113. Post-operative radiograph showing standard femoral component with large diameter femoral head

Fig. 7.114a,b. Pre- and post-operative radiograph of femur with intra-medullary rod