Session 2: Hip Resurfacing Patient and Treatment Options

Learning Objectives
Upon completion of this activity, participants should be able to:

1. Learn the accepted criteria to determine whether a patient is an acceptable candidate for hip resurfacing.

2. Learn the potential benefits and unique risks associated with hip resurfacing.

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Patient Selection and Benefits of Hip Resurfacing

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Metal-on-metal total hip resurfacing arthroplasty has become an increasingly popular option over the past 10 years. Multiple purported benefits of this procedure have been described. In addition, several reports have suggested that the outcomes of this procedure are improved with proper patient selection. The purpose of this lecture is to describe the reported benefits, as well as the patient selection process.

Hip resurfacing may have several advantages and unique risks compared with conventional total hip arthroplasty. One advantage is increased femoral bone stock, because the neck and most of the head are retained. Also, resurfacing prostheses may be simpler to place than stemmed prostheses in patients who have extra-articular deformities or hardware of the proximal femur. In addition, resurfacing may be associated with greater range of motion, improved gait parameters, lower dislocation rates, and increased activity levels. Finally, in the case of failure, revision to a conventional prosthesis is straightforward, with results that are comparable to a primary stemmed total hip arthroplasty. Risks include femoral neck fracture, implant loosening, and exposure to metal ions.

Proper patient selection is important in hip resurfacing. Patients who have osteoarthritis and who have not responded to nonoperative treatment are indicated for this procedure. Patients who have osteonecrosis, rheumatoid arthritis, and Perthes disease have also...
undergone resurfacing, with good to excellent short-term results, although without the same degree of success as patients with osteoarthritis. Contraindications include severe osteopenia, large femoral head or neck cysts, a wide femoral neck relative to the head diameter or technical problem in surgery that leads to notching of the femoral neck, and severe obesity (body mass index greater than 35 kilograms per meter squared), all of which are associated with an increased risk of femoral neck fractures. Additionally, patients who have insufficient femoral head remaining are contraindicated. Age does not appear to be a contraindication based on the results in the literature.

The results of hip surface replacement are promising, and it may have multiple benefits for patients who meet the selection criteria. Longer-term follow-up will be necessary to confirm these results.

**Early Outcome Results With Hip Resurfacing**

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*Background:* The renewed interest in the clinically proven low wear of the metal-on-metal bearing combined with the capacity of inserting a thin wall cementless acetabular component has fostered the reintroduction of hip resurfacing. Although improved materials will certainly benefit implant survivorship, the difficult technical aspects of performing hip resurfacing will certainly also impact implant survivorship.

*Methods and materials:* Two hundred patients were prospectively enrolled in a multicenter study and followed for an average of 31.2 months (range, 12-54 months). Of 200 patients, 14 (7%) required revision surgery at a mean time of 19.5 months (range, 3-47 months).

We surveyed all for 14 Canadian academic centers regarding the implantation of hip resurfacing as well as assessed the first 50 cases of hip resurfacing done by 5 high-volume adult reconstruction surgeons with no prior training in hip resurfacing. Seventy-seven percent of patients were male, 80% had a diagnosis of osteoarthritis, and mean age was 49.3 years.

*Results:* Patients with failures were significantly younger and heavier than the nonfailures, and all were male. Patients who were revised did not differ from those who were not revised in terms of radiographic outcomes, but they did report lower functional outcome scores at all preoperative and postoperative testing intervals. Most failures (10/14) were related to early acetabular loosening.
Seventy-nine percent (11 out of 14) of Canadian academic centers are performing hip resurfacing, with the posterior approach being the most common. One center has stopped after initially performing the procedure in less than 30 cases.

The overall revision rate was 3.3% at a mean time of 2 years with femoral neck fracture (1.6%) being the most common cause for failure. The mean femoral stem shaft angle was 140 degrees (range 122-155). The mean cup inclination was 47 degrees (range 34-64).

**Conclusion:** This report highlights the importance of patient selection and surgical technique in hip resurfacing arthroplasty. For the most part, high-volume arthroplasty surgeons can expect a low failure rate in the initial learning curve.

References:

**Unique Complications of Resurfacing**

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The unique complications of surface replacement arthroplasty must be weighed against the potential benefits to determine whether its use is justified in patients presenting with significant hip disease.

Femoral neck fracture is a unique complication associated with hip resurfacing, with a 1% to 2% incidence in almost all reported series. According to the Australian National Registry, 47% of surface replacement revisions are for fracture.¹ Femoral fractures can be related to bone density, notching of the femoral neck, and femoral component positioning.² Pseudotumors, which differ from ALVAL, have only been described in female patients with surface replacements. Murray reported on 20 cases with pseudotumors, all female patients with surface replacements. Twelve of those cases required a revision to a conventional hip replacement. It is estimated that about 1% of
patients develop a pseudotumor in the first 5 years after surgery.³ Age and gender are also uniquely associated with the complications of resurfacing. The Australian National Registry reported surface replacement revisions in patients aged 65-74 was 3.8% vs 1.8% for conventional total hips. In patients aged 75 and older the percent increased to 9.6% in surface replacement compared to 1.9% in conventional total hips.¹ Older females are noted to have higher complication rates. Although stress shielding occurs routinely in conventional total hips without consequence, in surface replacements it can lead to femoral failure due to loss of bone.

References:

Case Presentation & Discussion Panel
Michael Mont, MD; Paul Beaule, MD; William N. Capello, MD; David K. DeBoer, MD