2.4 Consideration on disadvantages and problems of resurfacing

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Abstract

The concept of resurfacing the hip joint is not new, it is a bone conserving alternative to total hip replacement that restores normal joint biomechanics and load transfer and ensures joint stability.

Historically, these appealing characteristics have been recognized by several investigators and various designs and biomaterials have been used. In the early 1950s, Charnley experimented with a cementless all Teflon double cup arthroplasty (Charnley 1961, 1963). Loosening of both components due to rapid wear and an intense tissue reaction resulted in clinical failure and abandonment of the procedure.

In the 1970s and early 1980s a metal-on-polyethylene design was used with results which were poor. Enthusiasm for resurfacing disappeared although it was felt that the root of the problem may have been the materials used rather than the tecnique itself and new materials as shoud be considered.

Over the last decade, the previous problems associated with thin polyethylene acetabular components, reproducible quality of manufacturing of metal-on-metal implants, and component fixation issues appear to have been resolved and a more reliable prosthesis developed.

There are no long-term results available on the new-generation hip resurfacing arthroplasties. Studies of the Conserve Plus (Wright Medical Technology, Arlington, Tennessee), the McMinn and Cormet (Corin Medical, Cirencester, UK), and the Birmingham Hip Resurfacing (Midland Medical Technologies, Birmingham, UK) have a mean of 3 years' follow-up demonstrating survivorship of >97%. These studies demonstrate significantly better survivorship than previous generations of hip resurfacing prostheses (eg, Wagner, Imperial College London Hospital (ICLH), THARIES, Furaya).

Indications and contraindications for a resurfacing procedure are still being defined. The ideal candidate for a hip resurfacing procedure is currently believed to be a young (<60 years) active man with normal proximal femoral bone geometry and bone quality who would be expected to outlive any current conventional prosthesis. Preoperative diagnoses can be varied and include osteoarthritis, osteonecrosis, and degenerative conditions secondary to developmental hip dysplasia, slipped capital femoral epiphysis, and Legg-Calve´-Perthes disease.

Currently, absolute contraindications include elderly people with osteoporotic proximal femoral bone, known metal hypersensitivity, and impaired renal function. Relative contraindications include inflammatory arthropathies, severe acetabular dysplasia, grossly abnormal proximal femoral geometry (as may be encountered with some severe cases of Legg-Calve´-Perthes and slipped capital femoral epiphysis), large areas of avascular necrosis, and large geode formation.

Problems that have been encountered can be divided into two main groups: 1: those associated with any type of hip arthroplasty; for example, dislocation, thromboembolic disease, heterotopic ossification, nerve palsies, and vascular damage; and 2: those that are more specifically related to the hip resurfacing procedure: femoral neck fractures, avascular necrosis, and sound initial and durable longterm fixation of an all-metal monoblock cobalt/ chrome acetabular component. Moreover currently all hip resurfacing implants employ metal-on-metal bearing couples. Metal-on metal bearings produce elevated metal ions with their theoretical concerns related to local and systemic effects. While resurfacing implants with their larger diameter femoral heads should produce lower wear rates, publications to date report equal, if not higher, metal ion levels.

However, despite the attraction of the procedure, unanswered questions still remain.

Does it matter if the serum cobalt and chromium levels rise after surgery? If a resurfacing is eventually converted to a total hip replacement, will the long-term results of that procedure be altered in any way? What is the true incidence of avascular necrosis and fracture of the neck of the femur? Are these technical issues or are they a feature of the prostheses used?

At the present time there are many unanswered questions surrounding the current generation of hip resurfacing implants. It would appear from several sources that early failure rates exceed those of conventional total hip replacements at comparable follow-up intervals.

The current models of hip resurfacing are a considerable improvement on previous versions. Whether they are better in the long term than a well-established total hip replacement remains to be seen.