



A randomised study comparing resection of acetabular bone at resurfacing and total hip replacement.

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Hip resurfacing is an increasingly popular arthroplasty choice for young patients in the UK. In England and Wales during 2004 45% of hip arthroplasty patients under the age of 55 years were treated with a resurfacing.¹ Recent publications detailing good and excellent mid-term results from specialist surgeons using contemporary implants are likely to increase this trend.²⁻⁵

Some surgeons however remain unconvinced by the resurgence of hip resurfacing and areas of concern include the risk of early revision for femoral neck fracture, later failure from disruption to femoral head vascularity, failure to conserve bone on the acetabular side, which implants will perform best in the long-term and the potential for raised systemic metal ion levels and the unknown long-term implications of this.

Joint registries are already providing some data on which implants and diagnoses appear to be associated with higher or lower rates of revisions of resurfacings.⁶ Well designed individual papers are however needed to address some specific areas of concern. It is easy to see femoral head resurfacing as a bone conserving procedure on the femoral side but can the technique can be bone conserving on the acetabulum? If so then the advantages both in terms of biomechanics and subsequent ease of revision are appealing.

This paper sets out specifically to address the area of acetabular bone resection. It benefits from being a well designed randomized study which in the future may also yield valuable comparative survivorship or outcome data between the two specific implants used. Loughhead et al⁷ have previously reported that more bone was removed from the acetabulum in resurfacing versus hybrid total hip arthroplasty. This is however a complex area and the amount of bone removed depends on several factors.^{8,9,10,11} These can be broadly broken down into:-

- Implant factors
- Surgical technique
- Patient factors and patho-anatomy

With respect to implant factors the main factors are the thickness of the acetabular shell and the increments between the sizes. The shape of the specific component used (Durom, Zimmer, Warsaw, Indiana) with a flattened pole and slightly less than complete hemispherical shape (subtended angle of 165°) is also considered but I think these aspects are less

critical. Absolute acetabular component size is also affected by the design of the femoral component both in terms of the thickness of the metal and the required cement mantle.

The shell thickness, which is reflected in the difference between the femoral head diameter and the diameter of the cup, cannot be too thin in case deformation occurs which could affect the lubrication and friction of the bearing mechanism and potentially cause seizing or clamping of the femoral head. Thicker acetabular components will be more rigid but may require excessive acetabular bone resection if too thick. The wider the range of implant sizes available and particularly the smaller the increments between sizes the easier it is to carefully match the smallest safely possible femoral component to the femoral head and subsequently use the smallest corresponding acetabular component thus preserving acetabular bone. In this particular paper the resurfacing used has a wall thickness of 4mm and incremental sizes of 2 mm. Several contemporary implants are now available with incremental sizes of 2 or 3 mm and varying wall thicknesses. When selecting which implant to use both design factors and reported experience and revision rates need to be considered.

The surgical technique and patient factors are very well dealt with and one of the strengths of the paper is the careful description of the specific surgical technique used for the main presenting pathoanatomies of:

- Osteoarthritis
- Inflammatory arthritis
- Avascular necrosis
- Acetabular dysplasia

While these techniques are also suitable for uncemented total hip acetabular components care needs to be taken with polyethylene bearings not to use too thin a liner to try and preserve acetabular bone but subsequently induce early wear and osteolysis and the potential requirement for early revision.

The authors main findings are that with a specified implant and careful surgical technique bone removal on the acetabular side is comparable between a surface replacement and a total hip arthroplasty. One of the major criticisms of hip resurfacing can therefore be refuted. Obviously other areas of debate remain but it is good to see a well designed study presented and discussed clearly and directly answering an area of concern.

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