

Hip Resurfacing in Perthes' Disease

By Jason Brockwell May 2014

Introduction

Perthes' disease often leaves patients with a large 'mushroom-shaped' femoral head and a short femoral neck, and the leg is usually short on the affected side.

Perthes' disease affects very active children, who often remain active in adult life, so when their hip becomes painful, they often want a solution which allows them to remain active.

Hip resurfacing generally allows a high level of function, but, because of the deformity of the femoral head and the short neck, resurfacing usually cannot restore normal anatomy, but it is usually possible to resurface a post-Perthes' deformity hip and achieve excellent function [1-3], although there is usually a persisting leg length difference – however most patients are not concerned about it – they have had a leg length difference their entire adult lives and are used to it.

Comparison of hip resurfacing vs conventional total hip replacement in Perthes' disease

Hip Resurfacing (any system including Birmingham Hip Resurfacing)

Advantages:

1. Maximum bone preservation.
2. Highest level of function.

Disadvantages:

3. Usually not possible to fully correct leg length difference and restore normal fulcrum for gluteal muscles.
4. Usually requires at least 6 weeks partial weightbearing (with crutches) when used in Perthes' – because one attempts to increase length by converting bone from the large femoral head into bone to lengthen the short femoral neck – and this is weak for at least 3 months.

Birmingham Mid-Head Resection (BMHR) (unique short stem)

Advantages:

1. Medium bone preservation.
2. Highest level of function.

Disadvantages:

1. May not be possible to fully correct leg length difference and restore normal fulcrum for gluteal muscles.

General Surgery

breast, head & neck surgery
Dr James Kong

gastro-intestinal & bariatric
endoscopy & surgery
Dr Anthony Li

general surgery
Dr YP Tai

Spine & Pain Centre

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Dr HT Chow

children's spine
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pain medicine
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2. May requires a period of partial weightbearing (with crutches) when used in Perthes' because the abnormally broad femoral neck may not support the special stem.

Conventional total hip replacement (THR)

Advantages:

1. Can fully correct leg length difference and restore normal fulcrum for gluteal muscles.
2. Allows immediate full weightbearing (though crutches are usually required for a few weeks – but just for balance - there is no limit on the amount of weight one can put through the leg).
3. Can correct for abnormal femoral version (twisting of the thigh bone).

Disadvantages:

1. Minimum preservation of natural bone.
2. Usually lower function compared to resurfacing or BMHR – there is a higher risk of dislocation and, with ceramic bearings, a small risk of cracking or shattering the ceramic with hard impact eg a fall.

Case illustration:

50-year-old school teacher & sports coach with painful left hip.



X-ray shows typical post-Perthes' deformity with a large 'mushroom shaped' femoral head, short femoral neck, short leg, and, in this case, shallow acetabular socket.

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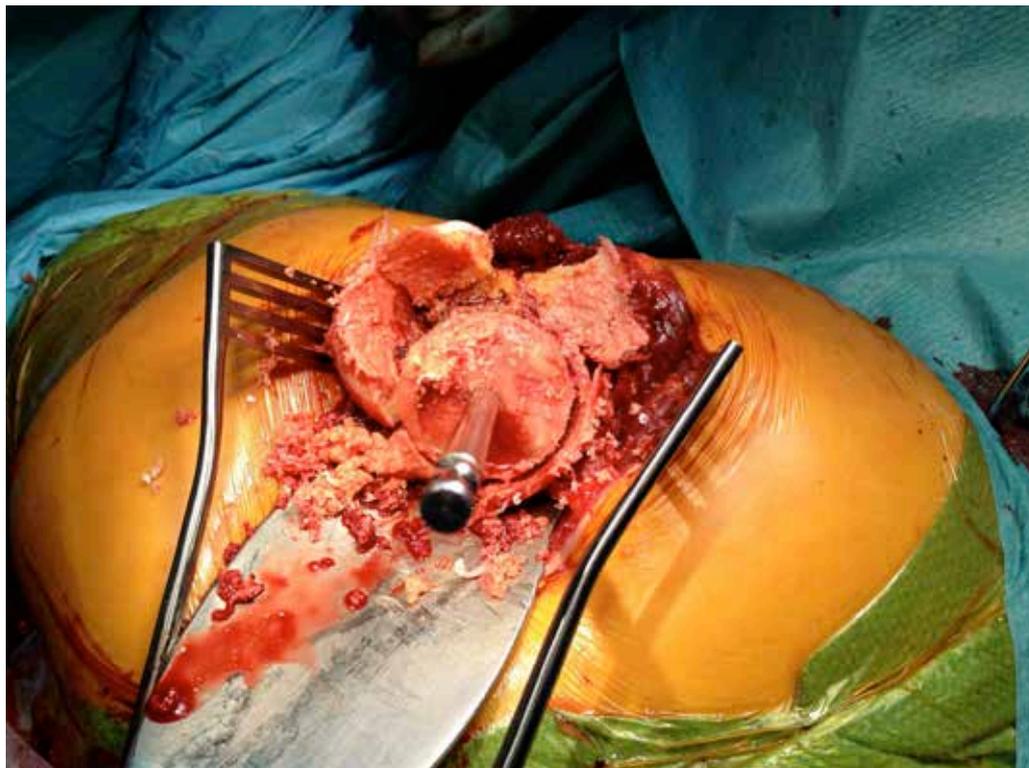


BHR in Perthes' disease: Pin in mushroom shaped femoral head.



BHR in Perthes' disease: Cylinder cutter removes more bone than in osteoarthritis from the mushroom-shaped head.

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BHR in Perthes' disease: Bone in the process of removal.

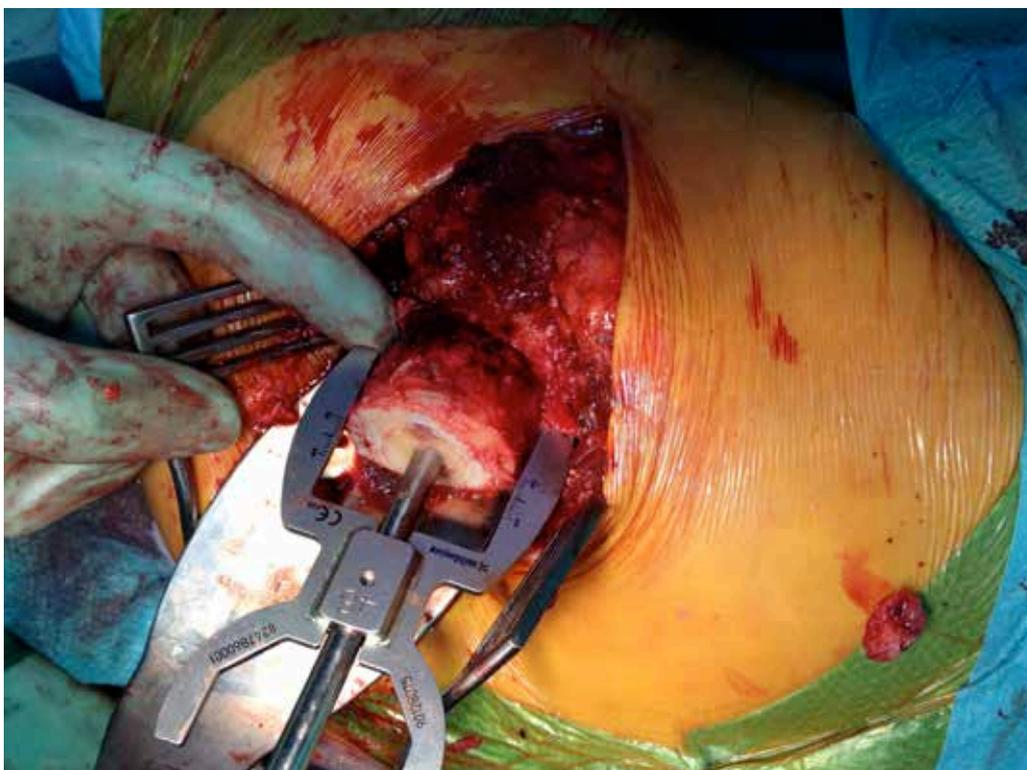


BHR in Perthes' disease: After cylindrical cut and removal of bone, head is cylindrical.

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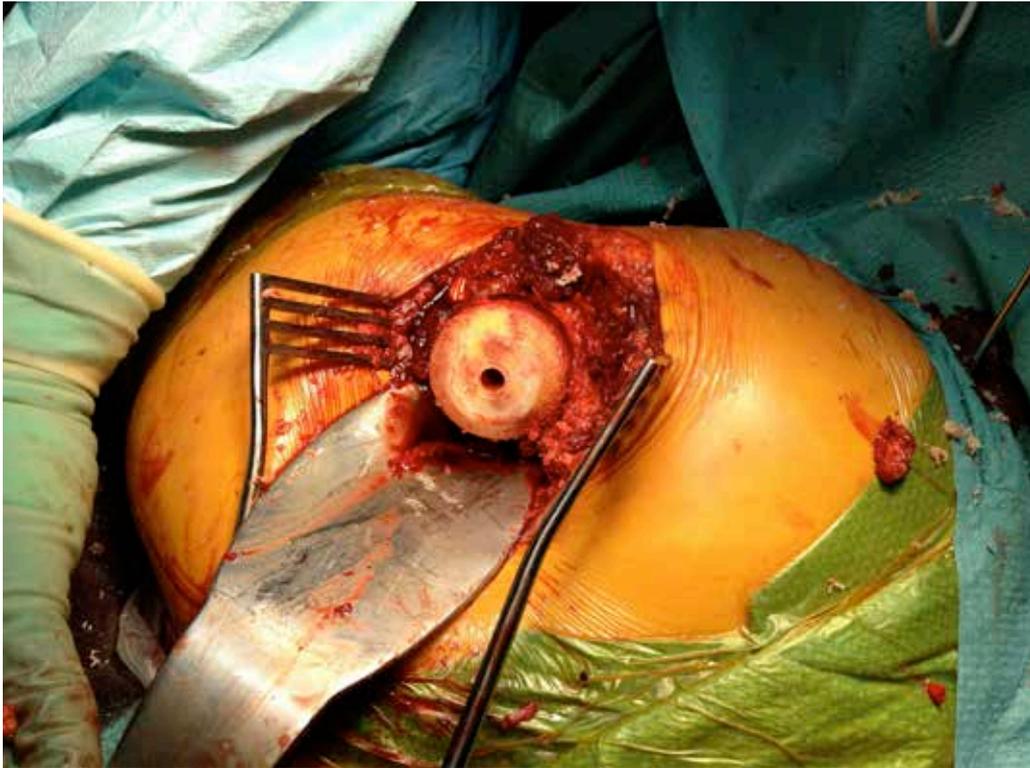


BHR in Perthes' disease: Minimal planing of zenith of head to try to preserve as much bone as possible to try to increase leg length.

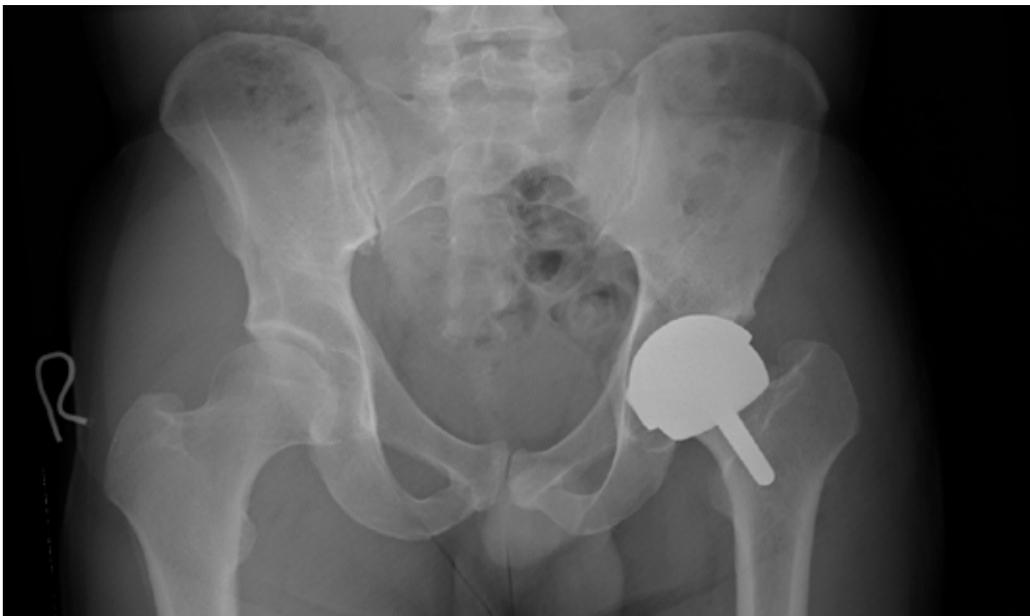


BHR in Perthes' disease: Despite minimal zenith bone removal, the head is still 5mm shorter than normal because of the flattening caused by the disease.

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BHR in Perthes' disease: Final appearance of bone before resurfacing component is placed. The bone quality is excellent in this case.



BHR in Perthes' disease: Post operative X-ray shows optimally positioned BHR implants, but the length has not been improved. Outcome was excellent: the patient was able to return to unrestricted sport, and was not concerned by the short leg. He as very happy.

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References

1. Kim, J., Y.J. Cho, and H.J. Kim, *Role of total hip arthroplasty and resurfacing in Legg-Calve-Perthes disease*. J Pediatr Orthop, 2011. **31**(2 Suppl): p. S241-4.
2. Amstutz, H.C., E.P. Su, and M.J. Le Duff, *Surface arthroplasty in young patients with hip arthritis secondary to childhood disorders*. Orthop Clin North Am, 2005. **36**(2): p. 223-30, x.
3. Boyd, H.S., et al., *Resurfacing for Perthes disease: an alternative to standard hip arthroplasty*. Clin Orthop Relat Res, 2007. **465**: p. 80-5.