

Minimally invasive total hip replacement

This document replaces previous guidance on single mini-incision hip replacement (interventional procedure guidance 152) and minimally invasive two-incision surgery for total hip replacement (interventional procedure guidance 112).

1 Guidance

- 1.1 Current evidence on the safety and efficacy of minimally invasive total hip replacement appears adequate to support the use of this procedure provided that normal arrangements are in place for clinical governance, consent and audit.
- 1.2 Surgeons undertaking this procedure should have specific training in the minimally invasive technique they are using, and in use of the instrumentation it requires.
- 1.3 Patient selection should be done by surgeons and their teams who can offer both conventional and minimally invasive total hip replacement.
- 1.4 Clinicians should submit data on all patients treated using this procedure to the National Joint Registry (www.njrcentre.org.uk).

2 The procedure

2.1 Indications and current treatments

- 2.1.1 Disability arising from hip pain is common and is usually caused by osteoarthritis. Conservative treatments include medication (anti-inflammatories and analgesics) and physiotherapy. If conservative treatments fail, hip resurfacing or a hip replacement may be necessary.
- 2.1.2 A traditional hip replacement involves accessing the joint through a large incision (approximately 20–30 cm in length) with division of muscles, ligaments and tendons. Several different approaches may be used.

2.2 Outline of the procedure

- 2.2.1 Minimally invasive total hip replacement is carried out with the patient under general or epidural anaesthesia, using an approach that aims to avoid damage to the muscles and tendons around the hip joint. A single incision of 10 cm or less in length is made. Alternatively, incisions are made at the front and back of the hip. Division of muscles may be necessary but is less extensive than in standard approaches. Specially designed retractors and customised instruments are typically used to expose the hip joint, prepare the acetabular socket and the femur, and insert the prosthesis. A specialised operating table may also be used. Fluoroscopic guidance and computer-assisted navigation tools may be used to aid positioning of the implant.
- 2.2.2 A range of different prostheses are available for this procedure, which may be cemented or uncemented.

Sections 2.3 and 2.4 describe efficacy and safety outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the overview, available at www.nice.org.uk/IP240aoverview

2.3 Efficacy

- 2.3.1 A systematic review of 1205 patients reported that there was no significant difference in the mean change of Harris hip score (which assesses functional ability and hip dynamics, scored from

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This guidance makes recommendations on the safety and efficacy of the procedure. It does not cover whether or not the NHS should fund a procedure. Funding decisions are taken by local NHS bodies after considering the clinical effectiveness of the procedure and whether it represents value for money for the NHS.

This guidance is for healthcare professionals and people using the NHS in England, Wales, Scotland and Northern Ireland, and is endorsed by NHS QIS for implementation by NHSScotland.

0 to 100, higher scores better) from baseline in patients treated by mini-incision total hip replacement (n = 597) compared with those treated by the standard-incision approach (weighted mean difference [WMD] 3.99) (95% confidence interval [CI] -0.18 to 8.16) (p = 0.06) (follow-up not stated). A case series of 759 patients (1000 hips) reported that the mean Harris hip score improved from 34 points at baseline to 92 points at a mean 37-month follow-up (significance not stated).

- 2.3.2 A randomised controlled trial of 219 patients treated by mini-incision or standard-incision hip replacement reported that 85% (88/103) and 91% (96/105) of patients respectively were able to 'mobilise' the day after the operation (p = 0.54).
- 2.3.3 The systematic review of 1205 patients reported that mean length of hospital stay was significantly shorter after minimally invasive procedures than after standard-incision procedures: WMD -3.59 (95% CI -5.69 to -1.50) (p = 0.0008).
- 2.3.4 The Specialist Advisers listed key efficacy outcomes as long-term functional result, length of hospital stay, requirement for analgesics, and blood loss.

2.4 Safety

- 2.4.1 Revision surgery was required in 1 patient in a case series of 400 hips at 18-month follow-up, in 2% (21/1000) of hips in the case series of 759 patients at a mean 37-month follow-up, and in 9% (8/90) of hips in the case series of 70 patients at a mean 11-year follow-up.
- 2.4.2 The systematic review of 1205 patients reported that the overall rate of complications was not significantly different between patients treated by minimally invasive surgery and those who had standard-incision procedures: odds ratio 1.08 (95% CI -0.59 to 1.97) (p = 0.81) (follow-up not stated).
- 2.4.3 Deep vein thrombosis or pulmonary embolism was reported in 1% (12/1000) of the hip procedures in the case series of 759 patients at a mean follow-up of 37 months.
- 2.4.4 The UK National Joint Registry reported rates of calcar crack (femoral crack around the insertion of the prosthesis) of less than 1% (95/19,041) in

patients treated by the procedure and less than 1% (1185/306,625) in patients treated by surgery using a standard approach. The rates of femoral shaft fracture were less than 1% (10/19,041 and 192/306,625 respectively) at follow-up of 0.1 to 6.5 years. Trochanteric fracture occurred in less than 1% (29/19,041) and less than 1% (622/306,625) of patients respectively.

- 2.4.5 The case series of 759 patients (1000 hips) reported heterotopic ossification in 20% (198/1000) of hips at a mean follow-up of 37-months, but none of these were high grade (grade IV) or required further treatment. The case series of 70 patients (90 hips) reported osteolysis in 11% (8/70) of hips that underwent radiographic assessment at a mean follow-up of 11 years.
- 2.4.6 The Specialist Advisers commented that malposition of components leading to dislocation, and femoral fracture are reported as adverse events. They considered theoretical adverse events to include neurovascular damage resulting from poor operative view.

2.5 Other comments

- 2.5.1 Most of the evidence presented to the Committee was on single-incision minimally invasive hip replacement. The Committee saw some evidence on minimally invasive 2-incision total hip replacement (much of it mixed with evidence on single-incision surgery). They noted that the 2-incision technique is seldom used in UK practice at present. NICE has asked the National Joint Registry to collect data on 1-incision and 2-incision minimally invasive hip replacement separately, to inform any future review of these different approaches.

3 Further information

- 3.1 For related NICE guidance see www.nice.org.uk

Information for patients

NICE has produced information on this procedure for patients and carers ('Understanding NICE guidance'). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind. See www.nice.org.uk/guidance/IPG363/publicinfo

Ordering printed copies

Contact NICE publications (phone 0845 003 7783 or email publications@nice.org.uk) and quote reference number N2328 for this guidance or N2329 for the 'Understanding NICE guidance'.

This guidance represents the view of NICE, which was arrived at after careful consideration of the available evidence. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of healthcare professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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