

# Automated percutaneous mechanical lumbar discectomy

## 1 Guidance

- 1.1 Current evidence suggests that there are no major safety concerns associated with automated percutaneous mechanical lumbar discectomy. There is limited evidence of efficacy based on uncontrolled case series of heterogeneous groups of patients, but evidence from small randomised controlled trials shows conflicting results. In view of the uncertainties about the efficacy of the procedure, it should not be used without special arrangements for consent and for audit or research.
- 1.2 Clinicians wishing to undertake automated percutaneous mechanical lumbar discectomy should take the following actions.
- Inform the clinical governance leads in their Trusts.
  - Ensure that patients understand the uncertainty about the procedure's efficacy and provide them with clear written information. In addition, use of the Institute's *Information for the public* is recommended.
  - Audit and review clinical outcomes of all patients having automated mechanical percutaneous lumbar discectomy. The Institute may review the procedure upon publication of further evidence.

## 2 The procedure

### 2.1 Indications

- 2.1.1 Lumbar radicular pain, also known as sciatica, refers to pain that begins in the lower back and radiates down the leg. It is commonly caused by a herniated (or prolapsed) lumbar intervertebral disc. The herniation is a result of a protrusion of the nucleus pulposus through a tear in the surrounding annulus fibrosus. The annulus fibrosus may rupture completely, resulting in an extruded disc, or may remain intact but stretched, resulting in a contained disc prolapse. This may then compress one or more nerve roots, causing pain, numbness or weakness in the leg.
- 2.1.2 Conservative treatments include the use of analgesics, non-steroidal anti-inflammatory medicines, physical therapy and hot or cold compresses. Epidural injections of corticosteroid may also be used. Surgery to remove disc material may be considered if there is nerve compression or persistent symptoms that are unresponsive to conservative treatment.
- 2.1.3 Alternative surgical treatments include open discectomy and minimally invasive microdiscectomy.

### 2.2 Outline of the procedure

- 2.2.1 Automated percutaneous mechanical lumbar discectomy is performed using local anaesthetic with or without conscious sedation. Under fluoroscopic guidance, a cannula is placed centrally within the disc using a posterolateral approach on the symptomatic side. A probe connected to an automated cutting and aspiration device is then introduced through the cannula. The disc is aspirated until no more nuclear material can be obtained.

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### This guidance is written in the following context

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

Interventional procedures guidance is for health professionals and people using the NHS in England, Wales and Scotland.

This guidance is endorsed by NHS QIS for implementation by NHSScotland.

## 2.3 Efficacy

- 2.3.1 In a randomised controlled trial (RCT) of 71 patients, 29% (9/31) had a successful outcome after automated percutaneous lumbar discectomy, compared with 80% (32/40) of patients after microdiscectomy ( $p < 0.001$ ). In a second RCT, 41% (7/17) of patients had an 'excellent' or 'good' outcome after automated percutaneous lumbar discectomy, compared with 40% (4/10) of patients after conventional discectomy. A third RCT compared automated percutaneous lumbar discectomy with chemonucleolysis and found that significantly more patients had a successful result after chemonucleolysis (61% [44/72] versus 43% [30/69],  $p < 0.05$ ).
- 2.3.2 Two large case series reported that 68% (707/1047) and 82% (1216/1474) of patients had an 'excellent' or 'good' result at 6 months and 1 year, respectively. A third case series reported an overall success rate of 45% (52/115) after a mean follow-up of 55 months. In two further case series reports, 94% (47/50) and 52% (95/182) of patients were satisfied after mean follow-ups of 6 months and 2.5 years, respectively. For more details, refer to the Sources of evidence.
- 2.3.3 The Specialist Advisors stated that there was some uncertainty about the efficacy of the procedure.

## 2.4 Safety

- 2.4.1 Few complications were reported. Three studies reported discitis in between 0.2% (2/1146) and 1% (2/182) of patients. Two studies reported haematoma in 0.1% (1/1146) and 1.4% (1/69) of patients. Other complications included back muscle spasms, minor bleeding, minor radicular injury and vasovagal syncope. For more details, refer to the Sources of evidence.
- 2.4.2 The Specialist Advisors stated that vascular and nerve damage, discitis and infection were potential adverse effects of the procedure.

## 3 Further information

- 3.1 The Institute has also published guidance on laser lumbar discectomy ([www.nice.org.uk/IPG027](http://www.nice.org.uk/IPG027))

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### Information for the public

NICE has produced information describing its guidance on this procedure for patients, carers and those with a wider interest in healthcare. It explains the nature of the procedure and the decision made, and has been written with patient consent in mind. This information is available from [www.nice.org.uk/IPG141publicinfo](http://www.nice.org.uk/IPG141publicinfo)

### Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the following document.

*Interventional procedures overview of automated percutaneous mechanical lumbar discectomy*, February 2005

Available from [www.nice.org.uk/ip278overview](http://www.nice.org.uk/ip278overview)

### Ordering information

Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0929. *Information for the public* can be obtained by quoting reference number N0930.

The distribution list for this guidance is available at [www.nice.org.uk/IPG141distributionlist](http://www.nice.org.uk/IPG141distributionlist)

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