

Coil embolisation of unruptured intracranial aneurysms

1 Guidance

- 1.1 Current evidence suggests that coil embolisation is efficacious in obliterating unruptured intracranial aneurysms and that its safety is similar to that of surgical treatment.
- 1.2 The annual risk of haemorrhage from unruptured intracranial aneurysms varies widely, depending on their site and size; and the lifetime risk depends on life expectancy and other factors. The decision to treat unruptured intracranial aneurysms by coil embolisation therefore requires judgement of the risks for each patient, and recognition of the importance of patient choice. Clinicians wishing to undertake this procedure should ensure that:
 - normal arrangements are in place for audit and clinical governance
 - patients understand the relative risks of coil embolisation and surgery compared to the risk of having no treatment when giving their consent for this treatment. Use of the Institute's *Information for the public* is recommended.
- 1.3 The procedure should only be performed in specialist units with expertise in the endovascular treatment of intracranial aneurysms.

2 The procedure

2.1 Indications

- 2.1.1 Intracranial aneurysms are small balloon-like dilated portions of blood vessels that may occasionally rupture, causing haemorrhage, stroke or death. Usually, the cause is unknown, but people with genetic causes of weak blood vessels are more likely to develop aneurysms.
- 2.1.2 The traditional treatment for ruptured or unruptured aneurysms involves open surgery to clip the abnormal blood vessels inside the skull.

2.2 Outline of the procedure

- 2.2.1 The coil technique involves approaching the aneurysm from inside the diseased blood vessel, thereby avoiding the need to open the skull. A thin tube containing the coil on a guidewire is inserted into a large artery, usually in the groin, and passed up into the skull under radiological guidance. The coil is placed inside the aneurysm and detached from the guidewire. Once in position, it causes clotting and stops blood from entering the aneurysm. Multiple coils may be inserted into the aneurysm through the same tube until the aneurysm is filled with coils.
- 2.2.2 The coil technique is mainly carried out on ruptured aneurysms but may also be used to treat unruptured aneurysms.

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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.

2.3 Efficacy

- 2.3.1 In a large observational study, it was reported that overall morbidity and mortality associated with endovascular repair was 9% (41/451) at 1 year after having the procedure, compared with 12% (233/1917) for surgery. Similar results were reported in smaller studies comparing the two techniques. However, these comparisons are difficult because patient characteristics differed between the two groups; for example, those who underwent endovascular repair were often older than those who had surgery.
- 2.3.2 For the patients undergoing endovascular repair by coil embolisation in the International Study of Unruptured Intracranial Aneurysms, obliteration was complete in 55% (207/379) of patients, incomplete in 24% (91/379), unsuccessful in 18% (67/379), and unknown in 3% (12/379) of patients. At 1 year after the procedure, less than 1% of patients (4/451) had a moderate or severe disability, as measured by the Rankin score. In other studies on this procedure, the rate of permanent complications ranged from 5% (6/116) to 8% (3/38). For more details, refer to the Sources of evidence.
- 2.3.3 The Specialist Advisors considered that the main uncertainty related to the long-term durability of the procedure.

2.4 Safety

- 2.4.1 In a retrospective study of 62 patients, the procedure-related complication rate was 23% (14/62) after coil embolisation. Major complications resulting in reduced functional status were reported in five patients (8%) and minor complications causing prolonged hospitalisation were reported in nine patients (15%). Adverse events during initial and follow-up hospitalisation included intra- or postoperative rupture (6%, 4/62 patients) and cranial neuropathy (11%, 7/62 patients). For more details, refer to the Sources of evidence.

- 2.4.2 In the large observational study, perioperative haemorrhage was noted in 2% (10/451) and cerebral infarction in 6% (26/451) of patients who underwent endovascular repair.
- 2.4.3 The Specialist Advisors considered that this was a safe procedure. One Advisor noted that complications during the procedure include rupture of the aneurysm or thrombo-embolic occlusion of intracranial vessels, but these complications are uncommon. There is also a small risk of delayed haemorrhage from the aneurysm.

3 Further information

- 3.1 This guidance relates to unruptured aneurysms. The Institute has also published separate guidance on the use of coil embolisation for ruptured intracranial aneurysms (www.nice.org.uk/IPG106guidance).

Andrew Dillon
Chief Executive
January 2005

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, in English and Welsh, from www.nice.org.uk/IPG105publicinfo

Sources of evidence

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

Interventional procedure overview of coil embolisation of unruptured intracranial aneurysms, January 2004.

Available from: www.nice.org.uk/IP274overview

Ordering information

Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0755. *Information for the public* can be obtained by quoting reference number N0756 for the English version and N0757 for a version in English and Welsh.

The distribution list for this guidance is available on the NICE website at www.nice.org.uk/IPG105distributionlist

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