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Coil embolisation of unruptured intracranial aneurysms

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NICE interventional procedure guidance 105

www.nice.org.uk/ipg105

Contents

1 Guidance	3
2 The procedure	4
2.1 Indications	4
2.2 Outline of the procedure.....	4
2.3 Efficacy.....	4
2.4 Safety	5
3 Further information	6
Sources of evidence.....	6
Information for patients	6
4 Changes since publication	7
5 About this guidance	8

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.

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 section.
- 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 section.
- 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](#).

Andrew Dillon
Chief Executive
January 2005

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.

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.

4 Changes since publication

As part of the NICE's work programme, the current guidance was considered for review but did not meet the review criteria as set out in the IP process guide. This guidance therefore remains current.

To be alerted to developments regarding the use of the procedure to treat ruptured intracranial aneurysms please refer to our [website](#).

26 January 2012: minor maintenance.

5 About this guidance

NICE interventional procedure 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. It is for healthcare professionals and people using the NHS in England, Wales, Scotland and Northern Ireland, and is endorsed by Healthcare Improvement Scotland for implementation by NHSScotland.

This guidance was developed using the NICE [interventional procedure guidance](#) process.

We have produced a [summary of this guidance for patients and carers](#). Information about the evidence it is based on is also [available](#).

Your responsibility

This guidance represents the views of NICE and 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.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way which would be inconsistent with compliance with those duties.

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