Coil embolization for intracranial aneurysms: an evidence-based analysis

Citation

Authors' objectives
At the request of the Ontario Health Technology Advisory Committee, the Medical Advisory Secretariat conducted a systematic review in early 2004 to assess the effectiveness and cost-effectiveness of endovascular coil embolization compared with surgical clipping to treat intracranial aneurysms. The review was updated in January 2006.

Authors' conclusions
For people in good clinical condition following (SAH) from an acute ruptured intracranial aneurysm suitable for either surgical clipping or endovascular repair, coil embolization results in improved independent survival in the first year and improved survival for up to seven years compared to surgical clipping. The rebleeding rate is low and not significantly different between the two procedures after the first year. However, there is uncertainty regarding the long-term occlusion status, durability of the stent graft, and long-term complications. For people with unruptured aneurysms, level 4 evidence suggests that coil embolization may be associated with comparable or less mortality and morbidity, shorter hospital stay, and less need for discharge to short-term rehabilitation facilities. The greatest benefit was observed in people over 65 years of age. In these patients, the decision regarding treatment needs to be based on the assessment of the risk of rupture against the risk of the procedure, as well as the morphology of the aneurysm. In people who require treatment for intracranial aneurysm, but for whom surgical clipping is too risky or not feasible, coil embolization provides survival benefits over surgical clipping, even though the outcomes may not be as favourable as in people in good clinical condition and with small aneurysms. The procedure may be considered under the following circumstances provided that the aneurysm is suitable for coil embolization: - Patients in poor/unstable clinical or neurological state - Patients at high risk for surgical repair (e.g. people>age 65 or with comorbidity), or - Aneurysm(s) with poor accessibility or visibility for surgical treatment due to their location (e.g. ophthalmic or basilar tip aneurysms). Compared to small aneurysms with a narrow neck in the anterior circulation, large aneurysms (> 10 mm in diameter), aneurysms with a wide neck (>4mm in diameter), and aneurysms in the posterior circulation have lower occlusion rates and higher rate of hemorrhage when treated with coil embolization. The extent of aneurysm obliteration after coil embolization remains lower than that achieved with surgical clipping. Aneurysm recurrences after successful coiling may require repeat treatment with endovascular or surgical procedures. Experts caution that long-term angiographic outcomes of coil embolization are unknown at this time. Informed consent for and long-term follow-up after coil embolization are recommended. The decision to treat an intracranial aneurysm with surgical clipping or coil embolization needs to be made jointly by the neurosurgeon and neuro-intervention specialist, based on the clinical status of the patient, the size and morphology of the aneurysm, and the preference of the patient. The performance of endovascular coil embolization should take place in centres with expertise in both neurosurgery and endovascular neuro-interventions, with adequate treatment volumes to maintain good outcomes. Distribution of the technology should also take into account that patients with SAH should be treated as soon as possible with minimal disruption.

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Address for correspondence
Medical Advisory Secretariat, 20 Dundas Street West, 10th Floor, Toronto, ON M5G 2N6 CANADA. Tel: 416-314-1092; Fax: 416-325-2364; Email: MASinfo.moh@ontario.ca

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