NICE guidance

Auditory brain stem implants

Interventional procedures guidance
Published: 26 January 2005

www.nice.org.uk/guidance/ipg108

1 Guidance

1.1 Current evidence on the safety and efficacy of auditory brain stem implants appears adequate to support the use of this procedure by surgical teams experienced in this technique, provided that normal arrangements are in place for consent, audit and clinical governance.

2 The procedure

2.1 Indications

2.1.1 This procedure is used to treat total deafness in both ears caused by damage to the vestibulocochlear nerve as a result of tumours or surgery.

2.1.2 In people with vestibulocochlear nerve damage, hearing is not improved by hearing aids or cochlear implants.

2.2 Outline of the procedure

2.2.1 The cochlear nucleus lies in the brain stem and is responsible for processing sound signals carried from the ear through the vestibulocochlear nerve. Auditory brain stem implants are electrodes placed in the cochlear nucleus.

2.2.2 Removal of vestibulocochlear nerve tumours and placement of auditory brain stem implants are often done at the same time. An incision is made in the skin on the side of the head and some of the bone behind the ear is removed. This exposes the tumour so that it can be removed and also allows access to the brain stem beneath it. The electrodes can then be implanted into the cochlear nucleus. The brain stem may sometimes be approached through the back of the head. People with auditory brain stem implants wear an external receiver and speech processor. This device converts sounds into electrical signals, which are then sent to the implant.

2.3 Efficacy

2.3.1 The evidence was limited to case series data. One study reported that 85% (75/88) of patients received auditory sensations when their implants were activated. In another study, some hearing was reported in 94% (51/54) of patients. For more details, refer to the Sources of evidence section.

2.3.2 One Specialist Advisor commented that results were unpredictable.

2.4 Safety

2.4.1 The main complications reported in the identified studies were: cerebrospinal fluid leak 3% (2/61); meningitis 2% (1/61); and pulmonary embolism 2% (1/54). A study of 61 patients reported no severe or serious non-auditory sensations. Tingling in various parts of the body was reported to be 'not uncommon' in a study of 88 patients. For more details, refer to the Sources of evidence section.

2.4.2 The Specialist Advisors listed the potential adverse effects of the procedure as death, damage to lower cranial nerves, intracranial haematoma/brainstem stroke, meningitis, and implant-related infection.

2.5 Other comments

2.5.1 This procedure is suitable for a small proportion of patients who have complete hearing loss for whom no alternative treatment would restore hearing. In the UK, this procedure has been performed on only a small number of patients in a limited number of hospitals.

2.5.2 Long-term data are needed for this procedure.

3 Further information

Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the overview to this guidance.

Information for patients

NICE has produced information on this procedure for patients and carers. It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

Update information

Minor changes since publication

26 January 2012: minor maintenance.

ISBN: 978-1-4731-4534-4

Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.