Stereotactic radiosurgery for trigeminal neuralgia using the gamma knife

Interventional procedures guidance
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Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

This guidance replaces IPG11.
1 Guidance

This document replaces previous guidance on stereotactic radiosurgery for trigeminal neuralgia using the gamma knife (interventional procedure guidance 11).

1.1 Current evidence on the safety and efficacy of stereotactic radiosurgery for trigeminal neuralgia using the gamma knife appears adequate to support the use of this procedure provided that the normal arrangements are in place for consent, audit and clinical governance.

2 The procedure

2.1 Indications

2.1.1 Stereotactic radiosurgery with the gamma knife is used to treat trigeminal neuralgia. This is a condition characterised by sudden bursts (paroxysms) of facial pain. These bursts may be triggered by touch, talking, eating or brushing teeth. The pain occurs in the areas supplied by the trigeminal nerve: the cheeks, jaw, teeth, gums, lips and, less often, around the eyes or forehead. Trigeminal neuralgia is rare; the annual incidence is 4 per 100,000 population.

2.1.2 Some people with mild symptoms recover without treatment. For most people, the paroxysmal bursts of severe pain continue indefinitely.

2.1.3 The first-line treatment for trigeminal neuralgia is medication. Surgery is considered for people who experience severe pain despite medication, or who have adverse effects from medication.

2.2 Outline of the procedure

2.2.1 Gamma knife radiosurgery involves aiming a focused beam of radiation at the trigeminal nerve at the point where it leaves the brain. It does not require skin incision, needle insertion or general anaesthesia.

2.2.2 Other treatments for severe trigeminal neuralgia include: glycerol injection, which involves inserting a needle into the nerve under X-ray guidance; radiofrequency treatment, which involves applying short bursts of radiofrequency energy to the nerve through a needle; and balloon

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microcompression, which involves inflating a balloon near the nerve. All of these are minimally invasive surgical procedures. Microvascular decompression is a more invasive procedure that involves opening the skull.

2.3 Efficacy

2.3.1 This procedure was the subject of a systematic review commissioned by the Institute and completed in January 2004. The review reported that between 33% and 90% of patients achieved complete pain relief immediately after stereotactic radiosurgery using the gamma knife. After a mean follow-up period of 18 months, the proportion of patients with recurrence of pain ranged from 0% to 34%, with an average of 14%. For more details, refer to the Sources of evidence section.

2.4 Safety

2.4.1 The most common complication reported was facial numbness, affecting 8% (139/1757) of patients. New or worsened trigeminal nerve dysfunction was reported in 4% (66/1757) of patients. Facial paraesthesia occurred in 2% (33/1757) of patients. Less commonly reported complications included troublesome dysaesthesia, loss of taste, corneal numbness and deafness. For more details, refer to the Sources of evidence section.

2.5 Other comments

2.5.1 These recommendations were based only on evidence on the use of the gamma knife. It is noted that other forms of stereotactic radiation treatment exist.

2.5.2 There is a lack of long-term data and the condition can recur.

2.5.3 Although the recurrence rate appears to be higher after stereotactic radiosurgery than after other treatments, the patient groups reported were not comparable. Relapse is most common in patients with multiple sclerosis and atypical neuralgia.

Andrew Dillon
Chief Executive
August 2004
3 Further information

Sources of evidence

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


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 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.

It updates and replaces NICE interventional procedure guidance 11.

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

Changes since publication

26 January 2012: minor maintenance.

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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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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.