

# Retrobulbar irradiation for thyroid eye disease

## 1 Guidance

- 1.1 Current evidence on the safety and efficacy of retrobulbar irradiation for thyroid eye disease appears adequate to support the use of this procedure in patients for whom other treatments are inadequate or associated with significant side effects. Normal arrangements should be in place for consent, audit and clinical governance.
- 1.2 Patient selection should be made with the involvement of a multidisciplinary team that includes an ophthalmologist, a clinical oncologist and an endocrinologist.

## 2 The procedure

### 2.1 Indications

- 2.1.1 Thyroid eye disease (also known as dysthyroid eye disease, Graves' eye disease, Graves' ophthalmopathy and thyroid orbitopathy) affects the extraocular muscles and other orbital tissues. It is the most common cause of unilateral or bilateral proptosis in adults, due to enlarged eye muscles and an increase in the fatty tissue behind the eyes.
- 2.1.2 Other symptoms include diplopia, soreness and grittiness of the eyes, with increased watering and photophobia. Most patients have mild symptoms that are controlled by conservative means. In patients with more severe disease, the eyelids may not close properly and this can result in corneal exposure and ulceration. In addition, the increased orbital tissue may cause optic nerve compression with resultant damage to sight.

- 2.1.3 Steroid medication is the most commonly used treatment for thyroid eye disease. This decreases inflammation in the eye muscles and orbital tissue. Often, high-dose systemic corticosteroids are required, but these have significant side effects. If active eye disease recurs after treatment, other therapeutic options may need to be considered.
- 2.1.4 Surgical orbital decompression aims to relieve severe pressure on the optic nerve. Various surgical procedures may be used to make room in the eye socket for the swollen and thickened orbital tissue. This allows the bulging eyeball to return to its normal position.
- 2.1.5 Radiation therapy targeted at the tissue behind the eyeball aims to decrease orbital inflammation. It may be used alone or in combination with steroids.

### 2.2 Outline of the procedure

- 2.2.1 Patients are commonly treated on an outpatient basis. The patient is placed in a supine position, and the head fixed with a full head shell. Irradiation is targeted at the retrobulbar contents of the orbit, delivered in about 10 sessions over a 2-week period.

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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. Interventional procedures guidance is for health professionals and people using the NHS in England, Wales and Scotland.

This guidance is endorsed by NHS QIS for implementation by NHSScotland.

## 2.3 Efficacy

- 2.3.1 A randomised controlled trial of irradiation versus sham therapy in 88 patients with mild, untreated thyroid eye disease found a greater response rate with irradiation, using a composite outcome measure of eye function and physical properties ( $p = 0.02$ , 52% versus 27%).
- 2.3.2 In a randomised controlled trial of 60 patients, improvement in eye motility was achieved in 82% (14/17) of patients following irradiation, and in 27% (4/15) of patients following sham therapy ( $p = 0.004$ ). At 24 weeks, mean eye elevation was improved by 4.9° more in the patients treated with irradiation ( $p = 0.01$ ). There were no significant differences in proptosis or eyelid swelling between the study arms.
- 2.3.3 When irradiation was compared with prednisolone in a randomised controlled trial, there were no significant differences in eye function between the treatment arms, as measured by proptosis, visual acuity or eyelid aperture size. Self-reported eye-evaluation scores were also similar at 24 weeks.
- 2.3.4 A randomised cross-over trial of 42 patients, with either the left or the right eye treated first, found no significant differences between eyes treated with irradiation and those receiving sham treatment in the outcomes of muscle volume and proptosis at 3 months following treatment. For more details, refer to the Sources of evidence.
- 2.3.5 The Specialist Advisors noted that efficacy was hard to assess because of the natural history of the condition.

## 2.4 Safety

- 2.4.1 Two case series with long-term follow-up of 7.2 and 11 years recorded the incidence of cataracts to be 10 and 11% (22/197 and 21/204), and reported retinopathy in 1% (2/197 and 2/204) of patients. One series found tumours in 5% (10/197) of patients treated with irradiation but none of these were in the area treated. Another case series found no malignant tumours in the head or neck in 157 patients followed up for a median 11 years. Mucosal thickening or polyps in the paranasal tissue were recorded in 34% (53/157) of patients followed up by CT scans. For more details, refer to the Sources of evidence.
- 2.4.2 The Specialist Advisors noted that theoretical adverse events include short-term exacerbation of thyroid eye disease, dry eye, cataract, retinopathy (particularly in diabetic patients) and carcinogenesis.

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December 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 from [www.nice.org.uk/IPG148publicinfo](http://www.nice.org.uk/IPG148publicinfo)

### Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the following document. 'Interventional procedure overview of retrobulbar irradiation for thyroid eye disease', April 2005  
Available from [www.nice.org.uk/ip257overview](http://www.nice.org.uk/ip257overview)

### Ordering information

Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0949. *Information for the public* can be obtained by quoting reference number N0950.

The distribution list for this guidance is available at [www.nice.org.uk/IPG148distributionlist](http://www.nice.org.uk/IPG148distributionlist)

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