

Endonasal bilateral simultaneous orbital decompression

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Abstract

Objective: To study the morbidity of the operation, to investigate its safety and effectiveness in order to establish if it is reasonable to offer it as treatment to patients in one sitting instead of a staged procedure. Finally, to identify the patient's long term satisfaction and to establish best practice. **Design:** Retrospective case series study and prospective telephone interview. **Setting:** Teaching General Hospital, Scotland, UK. **Subjects:** 14 patients with dysthyroid orbitopathy who underwent the operation over a 4 year period. **Results:** Proptosis improved in all but one of the cases. There was a relatively small morbidity and short inpatient stay. A significant amount of patients reported satisfaction with the results. All patients expressed strong preference for the simultaneous procedure instead of a staged one. **Conclusions:** The study shows that for the management of orbitopathy, bilateral simultaneous orbital decompression with endoscopic approach is a safe and effective operation, with small morbidity and significant patient satisfaction. Therefore, it is reasonable to offer it to patients instead of a staged procedure. *Hippokratia 2006; 10 (4): 167-170*

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Introduction

Dysthyroid orbitopathy (D.O.) is an autoimmune disorder. When severe, it can have 4 important consequences: First, cosmetic deformity from proptosis. Second, exposure keratopathy can result from the inability to close the eye lids. Third, diplopia (progressive) can result from impaired extraocular muscle function. Fourth, optic neuropathy can result from compression of the optic nerve or its vasculature from the enlarged extraocular muscles.

A variety of modalities have been used to treat D.O.: Systemic steroids may improve the symptoms but they may have to be continued at high doses for many months. Even then signs and symptoms often return when the medication is stopped. No large randomised placebo controlled trials of steroids in thyroid disease have been conducted¹.

External beam irradiation is efficacious for treating the neuropathy but it does not significantly improve the proptosis.

Immunosuppressive agents are still experimental and may have potentially serious side effects.

The mainstay of therapy for the severe cases remains surgical decompression of the orbital contents into an adjacent space.

Orbital decompression for D.O. has traditionally been performed through either an external or transantral

approach. The development of intranasal endoscopes made the transethmoidal approach possible. Currently, most surgeons perform the procedure staged in an attempt to try to minimize serious morbidity.

A review of the literature revealed a relative paucity on the subject: A small amount of papers were identified referring to the bilateral simultaneous endoscopic method, examining a relatively small number of patients. No papers were identified referring to patient satisfaction and quality of life after this procedure.

The present study is important, because with clinical governance in the modern NHS, increasing significance is being placed on identifying best practice which is cost effective and safe. We looked retrospectively at the management of 14 patients who underwent bilateral simultaneous endoscopic orbital decompression.

Materials & Methods

Patients who underwent bilateral simultaneous orbital decompressions for Graves disease with proptosis and compressive optic neuropathy, not responding to medical treatment. The procedures were carried out using endoscopic approach, were operated during the 4 years (2001-2004) and were identified from the theatre records. Case notes were retrieved and 14 cases were identified (28 orbits), which form the study material of this paper. The information was collected retrospectively,

through a proforma facilitating extraction of demographic details, indications for operation and pre and post operative results. It also detailed complications, number of days of inpatient stay, number of outpatient follow up appointments and the surgeon's and the patient's overall evaluation of the outcome.

In addition, all patients were contacted independently over the telephone and were asked a specific number of quality of life questions, in order to establish their long term satisfaction with the outcome. A telephone interview is probably not the optimal assessment method as patients often do their best not to upset the surgeon or the team who has operated on them and therefore may not always give an objective answer. Nevertheless, as many of those patients had to travel long distances from all over East Scotland for their operation, it was not considered practical to bring them back for full assessment for audit purposes. Finally, a telephone interview was chosen instead of a postal questionnaire with prepaid response envelope, as our population sample was not large and any potential non responders would reduce the size even further.

Pre-operative assessment

All patients underwent a computed tomography (CT) scan of the orbits and sinuses pre-operatively to assess the anatomy. In addition all patients were under the care of one or two ophthalmology consultants with a special interest in thyroid disease and were carefully assessed prior to and following surgery.

Results

The Western General Hospital serves a population of approximately 500000 people.

During the period of the study, 14 patients were operated upon and form the clinical material for this study. All 14 patients were of Caucasian origin, with a 3.6:1 female to male ratio (11 females and 3 males) and an average age of 50 years (range 28 to 69 years).

All cases were referred to the ORL dept by the department of Ophthalmology.

The initial referral was of a patient with proptosis in 13/14 (93%) of the cases and the remaining one was suffering from compressive optic neuropathy without proptosis therefore the main indication for surgery was cosmesis. The clinical presentation of these patients is summarized in Table 1. The same surgeon carried out or supervised all 14 operations.

Pre operative findings:

Proptosis: 13/14 patients were noted to have proptosis before the operation. Mean pre operative Hertel measurement was 26 mm (range 23-35 mm).

Diplopia: Only two patients presented with diplopia before the operation, while one case was not clearly documented.

Post operative results:

Proptosis: In all but one case different degrees of

Table 1. Clinical presentation of patients

Proptosis	13
Diplopia	2
Difficulty focusing on upward gaze	2
Upper & lower lid retraction	3
Corneal drying	2
Watery eyes	1
Intraocular pressure (uncontrolled)	3
Compressive optic neuropathy	1
Conj. Oedema and hyperaemia	1

improvement were achieved. In 2 of them, the exact post-op figure was not mentioned in the notes. Proptosis was reduced by an average Hertel measurement of 3.8 mm (range 2-7 mm).

Diplopia: 8 patients were noted to suffer from diplopia albeit temporary. The majority of these cases required squint surgery. One case was not clearly documented.

Optic Neuropathy: There was significant improvement with return of full range eye movements. The patient was able to come off the steroid treatment. Increased intraocular pressure returned to borderline normal

Septoplasty: 8/14 (57%) required some degree of septal surgery to improve access.

Operating time: An average operating time for the procedures was 2^{1/2} hrs.

Procedure: A total anterior and posterior endoscopic ethmoidectomy with sphenoidotomy (to ensure the most posterior segment of the accessible medial orbital wall has been identified) and extended maxillary antrostomy (to provide infero-medial decompression and as prophylaxis against maxillary sinusitis) was performed. The medial orbital wall (lamina papyracea) was fractured. The lamina was removed, taking care not to violate the periorbita because early release of orbital fat has a tendency to obscure the view.

When the bone of the medial wall was completely removed, the periorbita was incised to liberate the orbital fat and allow decompression. Limiting the depth of the incision is critical to prevent injury to the rectus muscles (especially the medial rectus) and to minimize bleeding. 2-4 horizontal periorbital incisions were made, starting from posterior and extending anteriorly. Starting with the inferior incision and sequentially moving to the most superior, is best to minimize the propensity of the orbital fat to obscure the subsequent incisions.

Gentle pressure to the globe can be applied during this maneuver for ease of incision and to assist with decompression of the orbital contents into the ethmoidal vault, which may require additional effort in an irradiated orbit. Finally, thin strands of periorbita may persist as bands between the horizontal incisions and should be carefully teased free with a nerve hook or similar instrument.

Complications:

Six patients had an uneventful recovery. The remaining

Table 2. Summary of surgical complications

Complication	No of patients	Remedy required
Epistaxis	2	Packing
Nasal adhesions	2	Surgical division (one case)
Exposed dura	1	None (no CSF leak)
Corneal abrasion, periorbital haemorrhage	1	Conservative treatment by the department of Ophthalmology
Rhinitis	1	Antibiotic treatment

8 (57%), had some minor complications, which are summarized in Table 2. There were no serious complications.

Inpatient stay: 1.7 days mean (range 1-3)

Outpatient FU appointments: 2.7 mean (range 1-5)

Surgeons perception of outcome:

In 13/14 cases there was evidence of improvement. In the remaining one case the surgeon reported the result as improvement, without improvement in the actual readings.

In 11/14 cases, there was documented evidence of the patients satisfaction with the result. In 3 cases the patients opinion was not recorded in the notes, despite subjective evidence of improvement in all.

Patients perception of long term outcome:

All 14 patients were contacted over the phone, 10/14 successfully.

Among the 10 patients who were contacted over the phone:

Six (60%) mentioned that they were clearly happy with the outcome. Four (40%) said that they were fairly happy. All four of the second group suffered temporary post operative diplopia, but no deterioration in visual acuity.

Eight (80%) would decide on the same operation again, while 2 were uncertain.

Nine (90%) would recommend the operation to a friend, while

Ten (100%) said that they were happy they had both eyes operated in one sitting and they would prefer this to a staged operation.

Discussion

The mainstay of therapy for severe D.O. remains surgical decompression of the contents into an adjacent space. Different methods to achieve this have been described for almost a hundred years:

In 1911 Dollinger performed a lateral wall decompression, nevertheless with minimal extent. Naffziger² developed a superior decompression of the contents into the anterior cranial fossa (Figure 1). Consequently, Sewall³ described a medial wall decompression through an external ethmoidectomy approach. Hirsch⁴ was the pioneer to employ a Caldwell-Luc approach to obtain result by removal of the orbital floor. Walsh & Ogura⁵ in 1957, extended this approach to include a medial wall decompression. Since then,

this approach is widely accepted as the standard approach for orbital decompression. In 1990 Kennedy⁶ described the first approach using nasal endoscopes. To maximize the degree of decompression obtained, he used a Walsh Ogura approach with a lateral orbitotomy. Olivari⁷ in 1991 described an alternative approach using transpalpebral decompression.

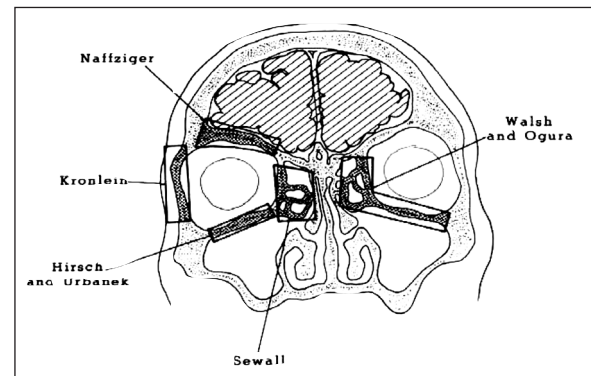


Figure 1. Schematic indicating areas of bone removal in the surgical procedures that have been described for decompression. (Modified from Calcaterra TC, Thompson JW: *Antral-ethmoidal decompression of the orbit in Graves disease. Laryngoscope* 1980; 90: 1941-1949).

Despite significant amount of literature on the various surgical modalities used for treating this disease, the bilateral simultaneous endoscopic approach has generally been neglected in the ORL literature. To our knowledge only 5 papers⁸⁻¹² have been published reviewing this specific method, most of them describing a relatively small number (10-15) of treated patients, the largest one of them describing a series of 26 patients¹². The lack of large series, makes it difficult to elaborate statistically significant results. None of them included any data on patient satisfaction following the procedure despite the existence of a QOL questionnaire specific for Graves disease¹³.

No literature was found to support a staged procedure.

This study is a retrospective analysis of cases. As a result, the quality of life questionnaire for Graves ophthalmopathy¹³ was not applicable as it also involves a pre-operative arm.

For many years failing visual acuity was the absolute

indication for surgical decompression. However, many patients found the cosmetic effect of proptosis particularly distressing and this has led to a change of the criteria for surgery.

Kennedy⁶ listed a deviated nasal septum as a contraindication to the endoscopic approach. In our experience, some limited septal surgery can be carried out easily at the same time of the procedure without adding any significant morbidity. The main contraindication is probably coexisting sinonasal disease which needs to be treated before the endoscopic decompression.

All the available surgical treatments are associated with some degree of diplopia which usually settles, but may require some muscle surgery. This was encountered in our study as well as others^{11,14} using a similar approach. Two other papers found similar increases using a different (transantral) approach^{15,16}. All patients were counseled preoperatively that squint and later lid surgery may also be required for optimum cosmetic result.

The degree of decompression obtained in our cases, was independent of the pre-operative proptosis. This means that one does not have to allow the proptosis to become severe before operating in order to obtain an optimum decompression, instead surgical decompression should be considered when visual complications first appear or when the cosmetic disability of proptosis becomes significant. This does not agree with the findings of another study using a different (transantral) approach¹⁷.

It is remarkable that all patients were strong supporters of the bilateral simultaneous operation. Surgeons should bear that in mind during the initial consultation.

Further studies will be necessary to validate the Graves ophthalmology QOL questionnaire for English speakers and apply it to this procedure.

This retrospective study of 14 cases of bilateral simultaneous orbital decompression with endoscopic approach over the 4 year period (2001-2004), shows that it is a safe and effective operation with small morbidity and significant patient satisfaction and therefore it is reasonable to offer it to patients instead of a staged procedure.

Conclusion:

This approach appears to provide comparable results to traditional methods of orbital decompression while avoiding the morbidity of an external ethmoidectomy or Caldwell Luc procedure. It has the added benefit of less disruption to the patients social life compared to the staged procedure. However, it requires a surgeon with extensive experience in endoscopic sinus surgery.

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