

ENDOSCOPIC DECOMPRESSION OF ORBIT AND OPTIC NERVE IN GRAVES' DISEASE: CASE REPORT

M. H. Baradaran Far and M. R. Besharati

Department of Otolaryngology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

Abstract- Graves' disease is a clinical syndrome consisting of hypermetabolism, diffuse thyroid enlargement and exophthalmos, which has ocular complications. Due to the high incidence of these complications and the risk of blindness special attention is needed. Many therapeutic methods including medical surgical and radiotherapy for ocular complications are suggested. In cases of medical therapy failure, surgery is recommended. One of its methods is orbital decompression and if needed optic nerve decompression by transnasal endoscopy. A Graves' patient with bilateral exophthalmos and severe visual loss was operated. with this method. After surgery in addition to return of normal eye appearance and eye movements, visual acuity of left eye improved significantly. This article describes this method, its results and complications.

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INTRODUCTION

Graves' disease is a clinical syndrome consisting of hypermetabolism, diffuse thyroid enlargement, and exophthalmos which was first described in 1835 by Robert Graves. It is a multisystem disorder characterized by one or more of the following:

1. Hyperthyroidism with diffuse thyroid enlargement
2. Infiltrative ophthalmopathy
3. Infiltrative dermatopathy (peritibial myxedema)

Current research suggests an autoimmune factor with the TSH receptors as the target molecule. There is ophthalmic involvement in most Graves' disease patients but only about 5% of them require treatment for ophthalmic disorders (1). Ophthalmic involvement is often bilateral and asymmetric and its progress does not correlate with the level of thyroid dysfunction or treatment of disease.

Correspondence:

M.H. Baradaran Far, Department of Otolaryngology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
Tel: +98 21 6703037
Fax: +98 21 6760245
E-mail: Baradaranf@hotmail.com

Ophthalmic involvement is the result of optic nerve compression and keratopathy and involvement of extraocular muscles is the main source of eye movement disorders. Although these muscles are greater than normal in CT scan but thyrocyte are normal and a fibroblastic proliferation and lymphocytic infiltration are present (2). Surgical and non-surgical methods for prevention of visual loss and improvement of eye function have been described. The method used most commonly for orbital decompression is the method described by Walsh Ogaro in 1957. By removing inferior and medial orbital walls, this method allows orbital contents to prolapse into maxillary and ethmoid sinuses. This method is currently done by endoscope or with transantral ethmoidectomy and Caldwell-Luc approach (3). The alternative method is a combination transnasal and transantral approaches for removing medial and inferior orbital walls. We describe a case of endoscopic transnasal approach and its pre- and post-operative results.

Case report

The patient was a female of 49 years with documented Graves' disease and two years of medical treatment. Since 9 months age, she had exophthalmos. Visual loss in the left eye to the level of hand motion, and eye movement restriction especially in lateral gaze were seen (Fig. 1). These findings progressed in spite of steroid therapy. Results of clinical and paraclinical examinations are as follows:

Seven months ago the patient was treated by radioactive iodine and since then was euthyroid. There was severe thyroid enlargement and also severe proptosis. There were no medical contraindications to surgery. Results of eye examination prior to surgery are in table 1.

All laboratory tests were normal. The patient was euthyroid and in coronal CT-scans of paranasal sinuses there were proptosis, left optic nerve compression, and hypertrophy of extraocular muscles, especially the the medial rectus (Fig. 2 A, B, C)

Surgical method

The operation was done under general anesthesia. A cotton pad soaked in 1: 5000 adrenaline solution was placed on nasal mucosa, and then 1: 200000 adrenaline solution was injected into it. Endoscopy was done by standard 0 and 30 degrees endoscopes.

Bilateral anterior and posterior ethmoidectomies were performed until ethmoid roof and lamina papyracea were completely apparent. Anterior wall of sphenoid sinus was removed because with prolapse of orbital contents to ethmoid cells there was risk of natural sphenoid sinus ostium obstruction. Then a maxillary sinus anastomy was done and the roof mucosa removed. Medial half of orbital floor was revealed and under endoscopic view, with a blunt hook and a fine Blakesly forceps, medial orbital wall and medial half of its floor removed, posterior to anterior. Posteroanterior incisions on orbital periosteum allowed prolapse of orbital contents into both maxillary sinuses (Fig. 3 A, B, C). In the left side, decompression of optic nerve was done; bones on the nerve were thinned with a curette and then removed and operation ended and the patient was discharged two days later (Fig. 4).

RESULTS

There were no complications after surgery. In addition to return of normal eye appearance, visual acuity of the left eye improved significantly. Results of eye examinations and comparison with preoperative ones are shown (Table 2).

Due to high incidence of ocular involvement in Graves' patients and possible irreversible complications, it is recommended that:

1. All Graves' disease patients should have routine and regular eye care.
2. Those with impaired visual function should receive prompt treatment.
3. If there is optic neuropathy or progressive keratopathy due to exophthalmos that does not respond to medical treatment, endoscopic transnasal decompression is indicated.

Table 1. Preoperative eye examination results

	VA	IOP	Ocular movements	Exophthalmos	Fundoscopy	MG
OD	20.80	25	Severe limitation	24 mm	N	Negative
OS	H. M	30	Severe limitation	25 mm	2+ disc pallor	2+

Table 2. Pre- and postoperative eye examination results

	VA	IOP	Ocular movements	Exophthalmos	Fundoscopy	MG
OD (preop)	20.80	25	Severe limitation	24 nun	N	Neg.
OD (postop)	20.60	19	Moderately improved	19 mm	N	Neg.
OS (preop)	H. M	30	Severe limitation	25 mm	2+ disc pallor	2+
OS (postop)	20.160	20	Moderately limited	19 mm	1+ disc pallor	Neg.



Fig. 1. Preoperative patient pictures

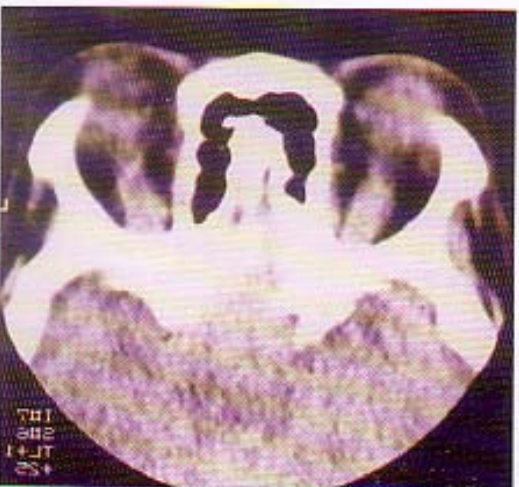
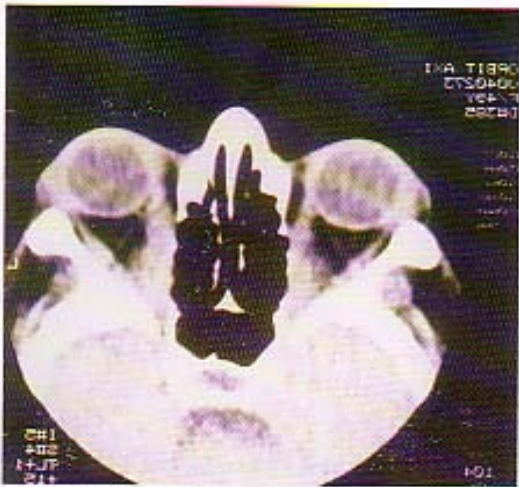
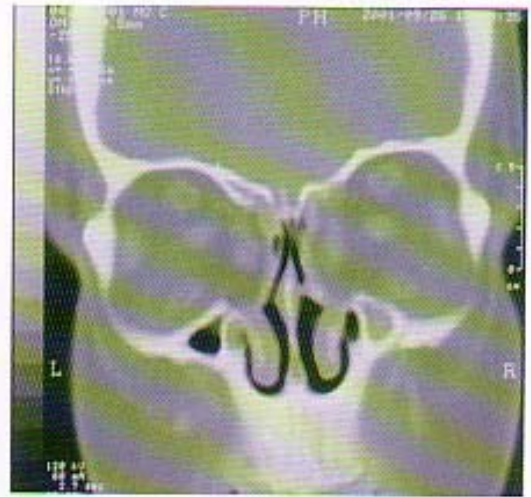
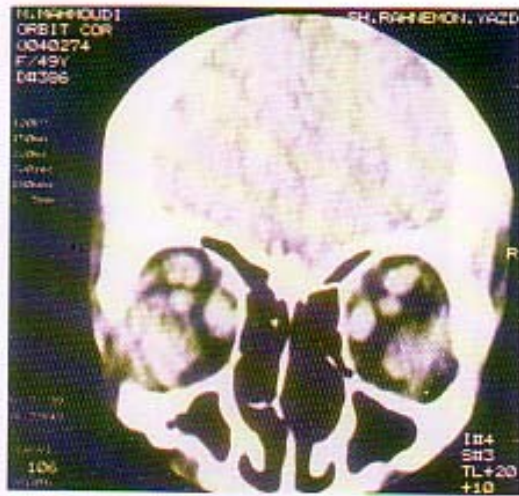


Fig. 2. Preoperative CT scan

Fig. 3. Postoperative CT-scan



Fig. 4. Post operative patient pictures

DISCUSSION

Treatment of Graves' disease and its ocular complications require understanding of its pathophysiology. It is characterized with accumulation of hydrophilic mucopolysaccharides and immune complexes in extraocular muscles and retrobulbar fat. Due to limited orbital space, enlargement of these muscles results in increased intraocular pressure, limitation of motion of extraocular muscles, diplopia, and ultimately exophthalmos and such complications as keratopathy and optic neuropathy that may result in blindness (4). Most patients with ocular complications respond well to a course of systemic corticosteroid therapy (5). In those patients that are resistant to corticosteroid therapy, ocular complications progress. These

patients may be treated by radiotherapy or surgery. Indications for surgical treatment are (6):

1. Optic neuropathy without response to medical therapy or any situation in which the patient could not tolerate corticosteroids or there is recurrence following termination of steroids

2. Progressive keratopathy

3. Prominent exophthalmos that could be operated on for cosmetic reasons, or improving proptosis and lidlag

Radiotherapy is restricted to those patients that are resistant to medical therapy or there is recurrence and the patient could not tolerate surgery (7). The primary goal of treatment is stopping and reversal of visual loss. Other goals are improving lids closure and eye movements. There are many surgical methods described by ophthalmologists, otolaryngologists, and neurosurgeons (8). Otolaryngologists

prefer to release orbital contents into maxillary and ethmoid sinuses. Use of transnasal endoscopy for its better visualization, magnifying, better access to ethmoid sinuses and ethmoid roof (fovea ethmoidalis), no skin or mucosal incisions, and lower morbidity is now preferred. Its sole limitation is removing lateral half of orbital floor and thus in those cases where there is need of extensive decompression and removing lateral half of orbital floor, both transnasal and transantral approaches are recommended (9).

REFERENCES

1. Pratt ME. Combined endoscopic transnasal and transantral orbital decompression. *Am J Otol* 1997; 18(3): 159-164.
2. Cooper DS. Antithyroid drugs. *N Engl J Med* 1984; 311: 1353.
3. Gamblin GT et al. Prevalence of increased intraocular pressure in Graves' disease. *N Engl J Med* 1983; 308: 420.
4. Inomata H et al. A patient with Graves' disease who developed hypothyroidism. *Endocrinol Jpn* 1988; 35: 379.
5. Mazzaferri EL. Textbook of endocrinology, ed. 1986; 3.
6. Okamoto T et al. Retrospective analysis of prognostic factors affecting the thyroid functional status. *World J Surg* 1992; 16: 690.
7. Solomon B et al. Current trends in the management of Graves' disease. *J Clin Endocrinol Metab* 1990; 70: 1518.
8. Sugino K et al. Management of recurrent hyperthyroidism in Graves' patients. *J Endocrinol Invest* 1995; 18: 415.
9. Tamai H et al. The mechanism of spontaneous hypothyroidism in Graves' patients. *J Clin Endocrinol Metab* 1987; 64:718.