

# Endoscopic Orbital Decompression for Dysthryoid Optic Neuropathy

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## ABSTRACT

### Objectives

To report vision outcomes and complications in patients undergoing endoscopic transnasal orbital decompression in the setting of acutely deteriorating sight secondary to dysthryoid optic neuropathy (DON) unresponsive to corticosteroid therapy.

### Methods

Retrospective case series at a tertiary-care academic hospital. Four patients with Grave's disease were identified that underwent urgent endoscopic orbital decompression for acutely deteriorating vision. Three patients underwent a second decompression of the other orbit for the same indication, yielding seven decompressions in total. Operative technique entailed inferior and medial wall decompressions. The posterior limit of medial wall decompression was just anterior to the annulus of Zinn to fully decompress the optic nerve. Primary outcome was visual acuity. Secondary outcomes were color vision, resolution of relative afferent pupillary defect (RAPD), and complications.

### Results

In all decompressions, visual acuity improved substantially. In 6/7 eyes, preoperative vision was severely impaired (20/100 to 20/400). In the final eye, preoperative impairment was mild (20/50). Postoperatively, the severely impaired eyes all improved, with post-decompression acuity ranging from 20/25 to 20/60. The mildly impaired eye improved to 20/15. In all cases, color vision was normal postoperatively and RAPD resolved when present. Three eyes with restricted extra-ocular movements (EOM) preoperatively continued to have restricted EOM postoperatively. One eye developed new slight EOM restriction several months postoperatively, which may have been secondary to progression of disease. No other complications were noted.

### Conclusion

Transnasal endoscopic orbital decompression is a safe, effective treatment for acutely worsening visual loss from DON. All cases demonstrated substantial objective improvement in vision.

## INTRODUCTION

- Dysthryoid optic neuropathy (DON) leading to loss of vision is the most disabling complication of Grave's disease.
- Incidence of Graves' disease is 50 per 100,000 with Graves' ophthalmopathy (GO) present in 10-25% and DON present in 2-5%.
- DON results from compression of the optic nerve at the orbital apex secondary to enlargement of extra-ocular muscles.

Patient	Orbit	Preop VA	Initial Postop VA	Final Postop VA	Time of Final VA Assessment (months postop)	Preop CV	Postop CV	Preop RAPD	Postop RAPD
1	Right	20/50	20/15	20/15	14	3/10	10/10	N	N
	Left	20/150	20/80	20/25	3	0/10	10/10	Y	N
2	Right	20/150	20/50	20/50	2	unknown	10/10	N	N
	Left	20/100	20/80	20/60	11	3/10	10/10	N	N
3	Right	20/400	20/40	20/30	7	0/10	10/10	Y	N
4	Right	20/200	20/30	20/40	10	unknown	10/10	Y	N
	Left	20/200	20/150	20/40	7	unknown	10/10	Y	N

**Table 1.** Outcome measures following orbital decompression. VA = visual acuity, CV = color vision, RAPD = relative afferent pupillary defect.

## METHODS

- Patients included underwent endoscopic transnasal orbital decompression for rapid, acutely deteriorating vision secondary to DON.
- Surgery was performed on an urgent basis
- Inferior and medial wall decompressions extending posteriorly to Annulus of Zinn at orbital apex.
- Lamina papyracea bone removed and periorbita opened to orbital apex inferiorly and medially.
- Herniation of orbital fat into sinuses.
- Color vision by ten-plate Ishihara test, visual acuity (VA), and presence of relative afferent pupillary defect (RAPD) recorded pre and postoperatively.

## RESULTS

- All seven orbits showed improved VA, normal colour vision, and resolution of RAPD (if present preoperatively) following decompression (Table 1).
- Two orbits had cataracts and these patients had VA of 20/40 and 20/60, another orbit had a previous lens implant for cataract and a VA of 20/40, with all other patients having postoperative VA of 20/30 or better.
- In 6/7 orbits, VA continued to improve or remained the same after the initial postoperative evaluation. In the final orbit, initial postoperative VA was 20/30, but then diminished to 20/80, and then finally improved again to 20/40 ten months postoperatively.
- Three orbits with restricted extra-ocular movements (EOM) preoperatively continued to have reduced EOM postoperatively.
- One orbit developed new slight restriction of EOM several months postoperatively.
- No other new EOM disturbance, decrease in VA, obstructive sinusitis, cerebrospinal fluid leak, or any other complication noted.

- Treatment with corticosteroids or radiotherapy can be effective with GO, but when sight is deteriorating acutely or despite medical treatment, surgical decompression of the orbit is indicated.
- Open (transfacial) as well as endoscopic transnasal approaches described.
- Endoscopic approach is safe, provides excellent visualization, and avoids facial incisions.
- We present our experience with urgent decompression of seven orbits in four patients for acutely deteriorating vision in the setting of DON.

## DISCUSSION

- Endoscopic orbital decompression for GO initially reported in 1990s, though these studies had only a few to no patients undergoing exclusively transnasal urgent decompression for acutely deteriorating sight secondary to DON.<sup>1-3</sup>
- Large series of 78 patients undergoing transnasal decompression that included 61 patients with DON showed improvements in VA, corroborated by present study, as well as similar improvements to open or combined approach and similar rates of EOM disturbance.<sup>4</sup>
- Selective decompression of the orbital apex alone (from basal lamella of middle turbinate to sphenoid face) has been proposed with promising results in a small series of six orbits.<sup>5</sup>
- The major limitation of the current series is the small sample size. A larger sample would be required to form conclusions on the rate of EOM disturbance or less common complications.

## CONCLUSION

- Transnasal endoscopic orbital decompression is a safe, effective treatment for acutely worsening visual loss from DON.
- Decompression performed on an urgent basis produced an immediate and substantial objective improvement in vision that persisted over time or in many cases showed further improvement.
- No complications were encountered in this series, but a larger sample would be required to accurately determine complication rates.

## REFERENCES

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