Graded Transcranial Orbital Decompression Outcomes in Stable Thyroid Eye Disease: a series of 47 orbits

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ABSTRACT
Purpose: To provide outcome data for transcranial orbital decompression for functional and aesthetic rehabilitation for exophthalmos in stable thyroid eye disease (TED).

Methods: Retrospective, non-comparative chart review of consecutive TED patients who underwent primary graded transcranial orbital decompression for exophthalmos by a single surgeon (JEP) between 2005 and 2018. Additional inclusion criteria included follow-up >90 days and no prior orbital surgery. Outcome data collection included millimeters of proptosis reduction, post-operative complications, and patient satisfaction.

Results: A total of 50 patients (47 orbits) were included. Average reduction in proptosis was 2.8 mm (range 0-9.0 mm, median 2.5 mm). Post-operatively, new onset diplopia occurred in four patients, V2 numbness in 15 patients, and sinusitis in 12 patients (2 dumbbell sinus). Phone surveys reached 91/90 patients (14 orbits); cosmetic improvement was reported in 14/14 orbits, relief of orbital ache reported in 10/10 orbits with pre-operative ache, relief of dry eye in 8/10 orbits with preoperative dry eye, and overall satisfaction score 8.9/10 (range 4-10, median 10).

Conclusions: Grade transcranial orbital decompression is a viable option for stable TED patients with orbital ache, exophthalmos, and exposure keratoconjunctivitis, resulting in a high degree of functional and aesthetic satisfaction in our cohort.

Background/Purpose
Thyroid-associated eye disease (TED) is an autoimmune mediated disorder that results in enlargement of orbital soft tissue within the bony enclosure of the orbit. Surgical management has a role in refractory disease with acute optic neuropathy, and in stable medically controlled TED for rehabilitation and cosmetic purposes. Techniques for decompression are numerous and have evolved for over a century.

Prior to beginning the operation, the nares are packed with 4% cocaine-soaked. It is critical to achieve these goals. Over several decades the transantral approach became increasingly popular among ophthalmologists before being supplanted by new variations.

The orbital floor is fractured medial to the infraorbital. The medial wall is infractured or removed. The reduction in proptosis resulted in high rates of patient satisfaction and subjective improvement in proptosis, dry eye, and exposure keratopathy for stable TED patients.

Results
Graded orbital decompression is created to achieve these goals. Over several decades the transantral approach became increasingly popular among ophthalmologists before being supplanted by new variations.

The infraorbital nerve (marked with an asterisk on a cadaver specimen) passes through the maxillary foramen in the thin bone between the lateral nasal wall and the medial maxillary sinus wall. This opening is located inferior to the middle turbinate.

General anesthesia with local infiltration anesthesia. Approximately 3cc of local anesthetic agent per side is sufficient. Care should be taken to avoid injecting the centrally located foramen ovale.

Prior to beginning the operation, the nare are packed with 4% cocaine-soaked. It is critical to measure proptosis at the start of the operation.

Methods
Retrospective chart review of stable TED who underwent primary graded transcranial orbital decompression for exophthalmos by a single surgeon (JEP) between 2005-2018 with a minimum follow-up of 60 days. Measured outcomes were improvement of proptosis (objectives and subjective), postoperative complications (new onset diplopia, V2 numbness, and sinusitis, and other), and overall patient satisfaction via phone survey.


Adverse events in this study were comparable or lower than previously cited literature.

Discussion
The level of decompression was tailored to each patient for symptom improvement and ideal aesthetic outcome.

The reduction in proptosis resulted in high rates of patient satisfaction and subjective improvement of orbital and dry eye symptoms.

Adverse events in this study were comparable or lower than previously cited literature.

Representative cases: (left before and after right transcranial decompression in a 25-year-old female. (center) Before and after transantral orbital decompression of the left side followed by bilateral upper eyelid levator recession in a 52-year-old female, (right) CT images before and after for the central column case.

Selected References