

Orbital wall reconstruction

All surgeries involving [orbital wall reconstruction](#) for orbital or intracranial pathology that preoperatively resulted in proptosis between 2007 and 2017 were reviewed. Proptosis was measured by the exophthalmos index (EI): the ratio of the distance of the anterior limit of each globe to a line drawn between the anterior limit of the frontal processes of the zygomas, comparing the pathological eye to the normal eye. Postoperative radiographic measurements were taken at least 60 days after surgery to allow surgical swelling to abate. The orbit contralateral to the pathology was used as an internal control for normal anatomical orbital volume. Cases with preoperative EI < 1.10, orbital exenteration, or enucleation were excluded.

Twenty-three patients (16 females and 7 males, with a mean age of 43.6 ± 22.8 years) were treated surgically for tumor-associated proptosis. Nineteen patients harbored meningiomas (11 en-plaque; 8 sphenoid wing), and one patient each harbored an orbital schwannoma, glomangioma, arteriovenous malformation, or cavernous hemangioma. Preoperative EI averaged 1.28 ± 0.10 (range 1.12-1.53). Median time to postoperative imaging was 19 months. Postoperatively, the EI decreased to a mean of 1.07 ± 0.09 . Greater increases in size of the reconstructed orbit were positively correlated with greater quantitative reductions in proptosis ($p < 0.01$). Larger volume of soft tissue pathology was also associated with achieving greater proptosis correction ($p < 0.01$). Residual exophthalmos (defined as EI > 1.10) was present in 8 patients, while reconstruction in 2 patients resulted in clinically asymptomatic enophthalmos (defined as EI < 0.95). Tumor invasion into the superior orbital fissure sinus was associated with residual proptosis ($p = 0.04$).

Proptosis associated with intracranial and orbital pathology represents a surgical challenge. The EI is a reliable and quantitative assessment of proptosis. For orbital reconstruction in cases of superior orbital fissure involvement, surgeons should consider rebuilding the orbit at slightly larger than anatomical volume ¹⁾.

¹⁾

Heller RS, David CA, Heilman CB. Orbital reconstruction for tumor-associated proptosis: quantitative analysis of postoperative orbital volume and final eye position. J Neurosurg. 2019 Mar 8;1-6. doi: 10.3171/2018.12.JNS181385. [Epub ahead of print] PubMed PMID: 30849755.

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Last update: **2024/06/07 02:54**

