Endoscope-Assisted Removal of Post-Traumatic Orbital Epidermoid Inclusion Cyst: A Useful Adjunct

Case Report

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Abstract

Orbital epidermoid cysts are uncommon lesions within the bony orbit with varied symptomatology related to both the eye and the sino-nasal system. They are often slow-growing cystic masses which may cause facial asymmetry and visual loss due to pressure symptoms. Cross-sectional imaging such as computed tomography and magnetic resonance imaging are contributory and useful for assessment of the size and actual extent and should be mandatory before planning any surgical intervention. Open approaches and needle aspiration have been traditionally described; however, the use of the rigid nasal endoscope in the intraorbital compartment is a useful adjunct for exploration of the extent of the lesion and for complete surgical clearance. In this report, a 69 years old female with an old post- traumatic orbital epidermoid cyst which was removed completely using an endoscope via transorbital route was presented with the review of literature.

Keywords: Orbit, epidermoid cyst, proptosis, inclusion cyst, surgery, transorbital endoscopic surgery, case report

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Introduction

Sino-orbital masses often present with proptosis and swellings involving the bony orbit and the sinonasal system. Both benign and malignant lesions within the orbit have similar presentations; hence they constitute a diagnostic challenge for the otolaryngologist and the ophthalmologist alike. Orbital epidermoid inclusion cysts are one type of deep-seated lesion that lies adjacent to critical anatomical structures; therefore, radiological evaluation followed by surgical intervention is the standard of care. Open approaches have been advocated for removal. However, for complete cyst enucleation or marsupialization, combined endoscopic and open approaches may be superior to either approach alone. The authors present a case of an old traumatic epidermoid inclusion cyst of the orbit, which was operated on successfully by a combined approach. The use of the endoscope to ensure a good surgical view in narrow restricted corridors such as the orbit enhances visualization and reduces chances of leaving behind residual cyst wall.

Case Presentation

A 69-years-old female presented with complaints of left-sided gradual diminution of vision for two years along with a progressively enlarging swelling along the

lateral aspect of the left eye with protrusion of the left eye for the past six months. It was painless initially, but she had gradually developed left retro-orbital pain. The patient had a history of blunt trauma to the left eye fifteen years back, which had been treated uneventfully. On local examination, significant left-sided relative non-axial proptosis of 9 mm was noted, and the left eyeball appeared to be pushed infero-medially. Her corrected visual acuity was 6/60 in the right eye and 3/60 in the left eye (Snellen's chart). Extraocular movements in the left eye were restricted. Color vision and fundus examination were normal. Her hematological parameters were normal. Computed tomography (CT) scanning revealed an oval, homogenous, smooth-walled lesion occupying the supero-lateral region within the left orbit, arising from the extraconal compartment pushing the eyeball inwards and inferiorly (Figure 1).

A contrast-enhanced magnetic resonance imaging (MRI) of the brain with the nose, paranasal sinuses, and orbit sections showed a single, lobulated, cystic mass of 3.4x2.3x3.9 cm in the left extraconal intraorbital compartment, which was hypointense on T1 sequences and hyperintense on T2 sequences, with diffusion restriction. The lesion abutted the superior rectus, superior oblique, and lateral rectus muscles. There was a thin, maintained fat plane between the lesion and the optic nerve, with scalloping of the orbital walls. An absence of post-contrast enhancement of the lesion confirmed its cystic nature (Figure 2).

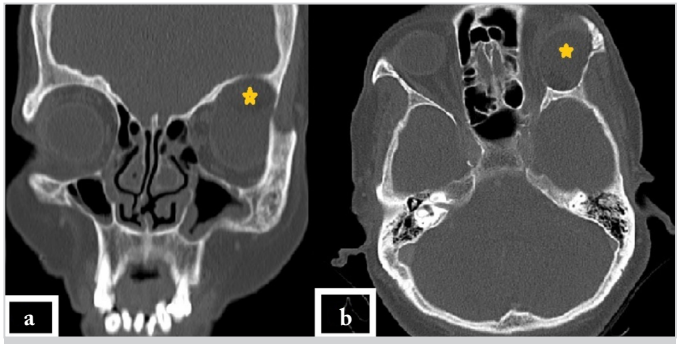

Figure 1. Preoperative computed tomography scan of the patient depicting the cyst location (yellow asterisk) within the intraorbital compartment. a) Coronal view, and b) Axial view

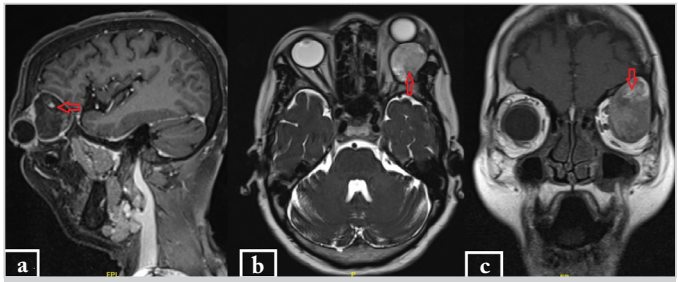

Figure 2. Preoperative contrast-enhanced magnetic resonance imaging depicting the cyst (red arrow). a) T1 sagittal, b) T2 axial, c) T2 coronal. A small region of T1 hyperintensity is seen within the posterosuperior aspect of the lesion, suggestive of probable blood within the cyst

Excision of the cystic mass under general anesthesia via an external approach was planned for the patient. A skin crease incision was made over the left orbit's eyelid on the supero-lateral aspect. After incising the orbicularis oculi, the thick membranous cyst wall was noted, which was adhered to the periosteum superiorly and periorbita medially. The cyst content could not be appreciated well and the posterior extent of the cyst wall was not seen. To avoid inadvertent incomplete removal, we decided to introduce a rigid endoscope (zero-degree, 4 mm, 18 cm) through the external incision to complete the procedure. Thick pultaceous material was suctioned out after introducing the endoscope. The cyst wall was removed piecemeal without violating the periorbita or the globe. Absence of any residual fragments of the cyst was confirmed. A clinical diagnosis of the epidermoid cyst was made. The cosmetic deformity was resolved postoperatively, and she continues to be on follow-up (Figures 3, 4). On one month follow-up, she had improved vision and resolved proptosis. Informed consent was taken from the patient for this case report.

Figure 3. Preoperative patient photograph showing the clinical extent of the proptosis

Figure 4. Postoperative patient photograph depicting the resolution of the symptom

Discussion

Intraorbital masses always pose a diagnostic challenge to both ophthalmologists and otolaryngologists due to the diversity of the possible lesions ranging from inflammatory abscesses and pseudo tumors to malignant masses. These lesions vary depending on their location in the orbit and present with various clinical and radiological features. Lesions within the orbit may have origins in the nose and paranasal sinuses (1), causing clinical dilemmas. Though proptosis is the most common presentation of orbital masses, they also present with pain in the orbit when deep-seated, and diplopia and sometimes diminution and restriction of the field of vision are present.

Epidermoid cysts of the lid and the orbit are extremely rare. They can be acquired or congenital. Acquired epidermal inclusion cysts are post-traumatic in origin due to the inclusion or implantation of epidermal, cutaneous, lacrimal or conjunctival elements into the dermis, especially after trauma (2). Post-traumatic or secondary inclusion cysts are typically seen in the areas of the body prone to maximal repeated trauma; hence, the intraorbital space is a rare site for its occurrence. Typically, epidermoid cysts contain a capsule that can be separated from its surrounding tissues and consists of inspissated keratin and whitish debris (3).

The painless, slow growth of orbital epidermoid inclusion cysts and their delayed presentation after the trauma often lead to confusion in clinical diagnosis. Entities like mucoceles, thyroid ophthalmopathy, or lacrimal system tumors give rise to a similar presentation. Such lesions can grow through the bony orbit and extend into nearby spaces such as the paranasal sinuses. Epidermoid cysts can also give rise to pain if they impinge on a deep-seated sensory nerve. Hence imaging is mandatory for ruling out other such lesions, whose managements differ significantly (4).

CT and MRI with contrast are the imaging modalities used to assess these lesions to formulate a definitive surgical plan based on extent and location. CT depicts a hypodense smooth lesion, with rim enhancement in case of abscess formation. An open biopsy or aspiration cytology can be attempted, but surgical extirpation is required to obtain tissue for histopathology and to correct the mechanical component of proptosis. The primary treatment modality is surgical removal because of the rare possibility of malignant transformation. Orbital lesions should be approached based on their location within the orbit. Open methods such as orbitotomy and craniotomy have been advocated (5, 6). However, a combined open and endoscopic approach provided superior visualization in our case. After skin incision and entry into the orbit, the introduction of the zero-degree endoscope into the cavity through the external incision allowed more space for suction of the contents, inspection of the cyst wall, and complete marsupialization and scraping of the cyst capsule from the orbital walls (Figure 5).

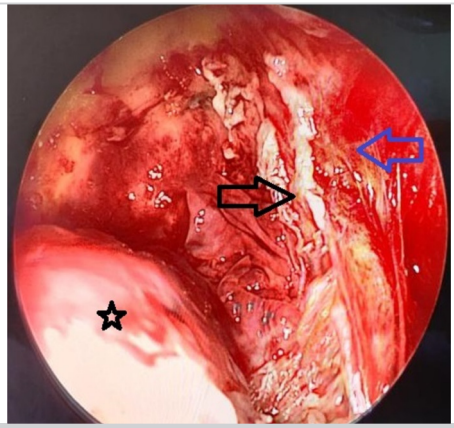

Figure 5. Intraoperative endoscopic view with a zero-degree endoscope depicting the globe (black asterisk), the lateral orbital wall (blue arrow), and the cyst wall (black arrow)

Moreover, the endoscope provides superior magnification in the narrow approach tunnel created by our lateral orbitotomy, thus reduces the chances of failure of the surgery. Similar to our approach, in their article Kashkouli et al. (7) mention that they used endoscopy in addition to open surgery to remove lateral orbital cystic dermoid cysts in six cases. They stated that a superior orbitomy via the eyelid was not ideal to introduce an endoscope because of the possibility of injury to globe contents. In cases requiring both endoscopic and open methods, various articles mention a cosmetically acceptable hairline incision or an incision over the calvarium at the pterion in combination with straight or angled scopes for maximizing access (8, 9). Furthermore, in our opinion, there is a reduced possibility of leaving behind any epithelium, which helps to avoid the future risk of a recurrence. Irrigation of the cavity was done afterward to flush out any possible remnants. Bipolar diathermy, in conjunction with the endoscope, was used to achieve hemostasis, as it is done in conventional endoscopic endonasal surgeries. There was no enophthalmos observed after the surgery in our case. An assistant is required to safely retract the globe medially to allow access. Large epidermoid cysts can be initially aspirated and decompressed to make space for the introduction of the endoscope.

In conclusion, post-traumatic orbital epidermoid cysts are rare, benign, mobile lesions that may evade diagnosis for years. Complementary approaches have been advocated for total removal (10). However, the endoscope is a useful tool for the exploration of the orbit through external incisions for better intraoperative clarity and management.

Conclusion

The causes of proptosis are many and diverse. Ophthalmologic, oncologic, and rhinologic causes should be considered, and appropriate investigations should be undertaken. Radiology is confirmatory for the diagnosis of intraorbital masses. The endoscope is a valuable tool

for exploring the extent and complete enucleation and marsupialization of the cyst in narrowly restricted areas such as the orbit. Traumatic implantation dermoid may evade diagnosis for years. Thorough history often provides a clue in this direction.

Informed Consent: Informed consent was taken from the patient for this case report.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: S.T., S.K.S., Concept: S.C., Design: S.C., S.T., J.L., S.K.S., Data Collection and/or Processing: S.C., S.T., Analysis and/or Interpretation: S.T., Literature Search: S.C., Writing: S.T., J.L.

Conflict of Interest: There is no conflict of interest to disclose.

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Main Points

- The causes of proptosis are many and diverse. Ophthalmologic, oncologic, and rhinologic causes should be considered, and appropriate investigations should be undertaken.
- Radiology is confirmatory for the diagnosis of intraorbital masses.
- The endoscope is a valuable tool for exploring the extent, and for a complete enucleation and marsupialization of the cyst in narrowly restricted areas such as the orbit.
- Traumatic implantation dermoid may evade diagnosis for years. Thorough history often provides a clue in this direction.

References

1. Pham NS, Dublin AB, Strong EB. Dermoid cyst of the orbit and frontal sinus: a case report. Skull Base 2010; 20: 275-8. [Crossref]
2. Dunbar KE, Kazim M. Orbital Inclusion cyst formation 3 years after penetrating orbital trauma. Ophthalmic Plast Reconstr Surg 2018; 34: e70. [Crossref]
3. Mandal SK, Mandal A, Bandyopadhya A. Post surgical giant epidermal inclusion cyst of the lid and orbit- a rare case. J Clin Diagn Res 2015; 9: ND01-3. [Crossref]
4. Ahmed RA, Eltanamly RM. Orbital epidermoid cysts: a diagnosis to consider. J Ophthalmol 2014; 2014: 508425. [Crossref]
5. Blanco G, Esteban R, Galarreta D, Saornil MA. Orbital intradiploic giant epidermoid cyst. Arch Ophthalmol 2001; 119: 771-3. [Crossref]
6. Tooley AA, Tailor P, Tran AQ, Garrity JA, Eckel L, Link MJ. Differentiating intradiploic orbital dermoid and epidermoid cysts utilizing clinical features and machine learning. Indian J Ophthalmol 2022; 70: 2102-6. [Crossref]
7. Kashkouli MB, Maleki M, Khademi B, Karimi N, Hamami P, Nadjafi-Semnani F. Endoscopic-assisted lateral orbitotomy for large orbital roof dermoid cysts with dural invasion. Ophthalmic Plast Reconstr Surg 2020; 36: 508-11. [Crossref]
8. Guerrissi JO. Endoscopic excision of frontozygomatic dermoid cysts. J Craniofac Surg 2004; 15: 618-22. [Crossref]
9. Chater-Cure G, Hoffman C, Knopman J, Rhee S, Souweidane MM. Endoscopy-assisted removal of periorbital inclusion cysts in children. J Neurosurg Pediatr 2011; 7: 161-4. [Crossref]
10. Eshraghi B, Shahsanaei A, Abounoori M, Pourazizi M. Atypical intraorbital dermoid and epidermoid cyst: A single institution cross-sectional retrospective study. Ann Med Surg (Lond) 2022; 79: 103997. [Crossref]