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Original Research Article

Unusual presentations of orbital dermoid cysts covering the eye: A case series and surgical approach

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Abstract

Orbital dermoid cysts are benign congenital lesions typically presenting in early childhood. While commonly asymptomatic, larger dermoid cysts can cause significant cosmetic and functional challenges when they encroach upon or cover the eye. We present three cases of large orbital dermoid cysts that extended over the eye, each posing unique diagnostic and surgical management challenges. This series highlights the clinical presentations, imaging characteristics, and surgical techniques employed, along with outcomes and follow-up data, contributing to a better understanding of these rare but impactful lesions.

Keywords: Orbital dermoid cyst, Congenital lesions, Orbital tumours, Surgical management, Astigmatism, Ptosis

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1. Introduction

Orbital dermoid cysts are congenital choristomas that arise due to the implantation of ectodermal tissue during embryogenesis. These cysts are lined by stratified squamous epithelium and contain adnexal structures such as hair follicles, sebaceous glands, and sweat glands. The most common location is in the upper outer quadrant of the orbit, often causing the eyeball to shift downward or protrude.[1,2]

Orbital dermoids are classified into superficial and deep types. The most common location for superficial orbital dermoids is the lateral side adjacent to the frontozygomatic suture.[3]

This case series describes three patients with orbital dermoid cysts, focusing on their clinical features, imaging findings, surgical treatment, and outcomes.

2. Case Series

2.1. Case 1

An 18-year-old female presented with a progressively enlarging, painless orbital swelling in the superotemporal quadrant of the left orbit, developing over 15 years.(**Figure 1**) The lesion was soft, non-tender, and mobile. CT imaging revealed a cystic lesion with well-defined margins and no bony erosion. Surgical excision was performed under local anesthesia. The cyst was removed intact, and histopathology confirmed a dermoid cyst. The postoperative period was uneventful, with no recurrence at six months.

2.2. Case 2

68-year-old male presented with progressive proptosis of the left eye for 10 years, without vision loss, pain, or diplopia. The lesion was firm, non-fluctuant, and non-tender, located in the superotemporal aspect of the left eye.(**Figure 2**) MRI revealed a well-defined hyperintense lesion on T1-weighted images without intraorbital extension. Complete excision was performed, and the cyst was removed without rupture. Postoperative healing was uneventful, with excellent cosmetic results.

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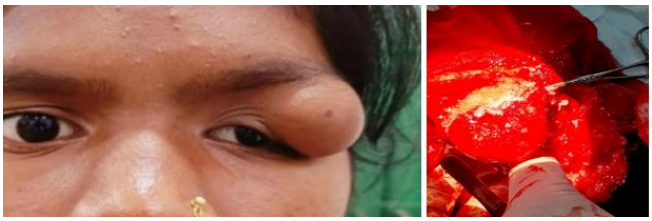

Figure 1: Dermoid cyst in the superotemporal aspect of the left eye, intraoperative photograph

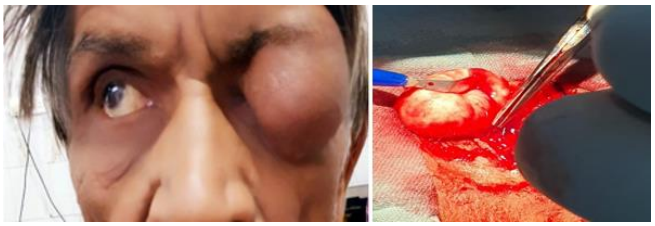

Figure 2: Dermoid involving the superotemporal aspect of the left eye, intraoperative photo

2.3. Case 3

A 28-year-old female reported a persistent orbital swelling with progressive ptosis of the right upper eyelid over nine years, with occasional discomfort.(**Figure 3**) Examination revealed a well-defined, non-tender mass in the lateral orbit of the right eye. CT scan showed a cystic lesion with well-defined margins. Surgical excision was performed, and histopathology confirmed the diagnosis. The patient recovered well with no complications.

Figure 3: Giant dermoid causing mechanical ptosis of right upper eyelid, intraoperative photograph

3. Discussion

Dermoid cysts are congenital dysembryoplastic tumors derived from ectodermal tissue. They belong to a group of benign heterotopic neoplasms known as choristomas, which are developmental tumor-like growths of histologically normal tissue in an abnormal location. Their exact pathogenesis remains uncertain, but they arise between the third and fifth weeks of gestation.[4]

Histologically, these cysts are enclosed by a surface epithelium similar to the epidermis and dermis, incorporating sebaceous glands, sweat glands, and hair follicles. Their inner lumen may contain collagen, keratin, fat, sebaceous fluid, hair shafts, cholesterol, and calcium deposits.[5,6]

The clinical presentation of dermoid cysts varies depending on their location within the orbit. Superficial cysts typically appear as subcutaneous swellings in the superolateral region of the eyelid, causing eyebrow deformity. These lesions are painless, non-inflammatory, and easily palpable along the orbital rim, commonly manifesting in childhood.[7] In contrast, deeper retrobulbar or peribulbar cysts present as slowly progressive, painless, irreducible, and nonaxial exophthalmos. When located near the optic nerve, these deeper cysts may lead to reduced visual acuity.

CT scans help determine the tumor's location, density, and relationship with surrounding structures. Dermoid cysts exhibit characteristic imaging features, typically appearing as well-defined lesions with an enhancing wall and a non-enhancing lumen containing irregular dense areas, corresponding to epithelial debris. The presence of calcifications around the lesion is a key diagnostic clue.[6,8] MRI is particularly useful for assessing the cyst's proximity to the extraocular muscles, periorbita, and optic nerve. On MRI, dermoid cysts appear as well-defined masses, with signal intensity varying based on their internal composition. Lipid-rich contents appear hyperintense on T1-weighted images, while protein-rich cysts appear hyperintense on both T1- and T2-weighted images. Since these cysts lack blood vessels, contrast enhancement is minimal.[6,9]

The primary treatment for orbital dermoid cysts, particularly those causing ptosis or globe displacement, is complete surgical excision to prevent rupture and avoid an acute inflammatory reaction or recurrence due to content spillage. Surgery is the only definitive treatment, requiring meticulous removal of the cyst along with its extensions to minimize the risk of recurrence, as the germinative center is located in the cyst wall. The cyst's lipid and keratin contents can trigger inflammation and secondary fibrosis, potentially complicating the procedure.[10] The choice of surgical approach depends on the tumor's size, location, and extent:

1. Anterior orbitotomy: Preferred for superficial cysts.
2. Lateral orbitotomy: Used for larger, deep-seated cysts.
3. Transcranial orbitotomy: Reserved for complex cases near the optic nerve.

Regardless of the technique used, complete excision is essential to prevent recurrence.[11]

4. Conclusion

Dermoid cysts are congenital, benign tumors of ectodermal origin, typically presenting as painless, slow-growing orbital masses. Superficial cysts are more common in childhood, while deeper lesions can cause progressive proptosis and ptosis. Imaging, especially CT and MRI, is essential for diagnosis, revealing well-defined cystic structures with characteristic features. Complete surgical excision is the definitive treatment to prevent recurrence, as the cyst's wall contains the germinative center. Care must be taken to avoid

rupture, which can trigger inflammation. Prognosis is excellent with proper excision, and various surgical approaches are chosen based on cyst location and extent.

5. Source of Funding

None.

6. Conflict of Interest

None.

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