American Journal of Ophthalmology Case Reports 36 (2024) 102125

Contents lists available at ScienceDirect

American Journal of Ophthalmology Case Reports

journal homepage: www.ajocasereports.com/

A rare case of inferior rectus dermoid cyst causing proptosis and optic neuropathy

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ARTICLE INFO

Keywords:
Orbital dermoid cyst
Inferior rectus dermoid cyst
Orbital mass
Strabismus
Diplopia

ABSTRACT

Purpose: To report a rare case of orbital dermoid cyst, involving the inferior rectus muscle, in a 26-year-old female presenting with proptosis and blurred vision in her right eye.
Observations: The unique features of this case are discussed, including the location and contents of the cyst, the surgical approach, and the postoperative outcome.
Conclusion and importance: The importance of considering dermoid cysts in the differential diagnosis of an orbital mass involving extraocular muscles and the need for a thorough evaluation to diagnose and manage these rare lesions.

1. Introduction

Orbital dermoid cysts are rare, benign lesions that arise from developmental anomalies of the embryonic ectoderm.[1,2] The cyst contains a variety of tissues such as skin, hair follicles, sebaceous glands, and adipose tissue. It can occur anywhere in the orbit, most commonly reported in the superotemporal quadrant,[3] However, involvement of the extraocular muscles is rare,[2,3] particularly involvement of the inferior rectus muscle. The patient can present with proptosis, double vision, orbital pain, a palpable mass, visual impairment due to compressive optic neuropathy,[2] or it can be an incidental finding on imaging studies.[1,3]

Here is the report of a rare case of orbital dermoid cyst, involving the inferior rectus muscle, in a 26-year-old female presenting with proptosis and blurred vision in her right eye for 4 months. The diagnosis was made through a combination of clinical examination and imaging studies, and the cyst was surgically excised. Publication of this report is authorized by a signed consent form by the patient, and approved by the ethics committee of Farabi Eye Hospital, and data were collected in accordance with the declaration of Helsinki. The unique features of this case are discussed, including the location and contents of the cyst, the surgical approach, and the postoperative outcome. Our case highlights the importance of considering orbital dermoid cysts, including those involving extraocular muscles, in the differential diagnosis of an orbital mass and the need for a thorough evaluation to diagnose and manage these rare lesions.

2. Findings

2.1. Case presentation

A 26-year-old woman was referred to our oculoplastic clinic with proptosis and blurred vision in her right eye in the past 4 months. There was no past or family history of ophthalmologic problems. She had not received any treatment before this presentation.

The best-corrected visual acuity was 20/25 in the right eye and 20/20 in the left eye. Examinations of the anterior segment of both eyes were normal. There was an inferior scleral show and 2 mm upper eyelid ptosis in the right eye, with proptosis of 3 mm compared to the left eye, using a Hertel exophthalmometer. In the evaluation of ocular motility, the right eye had a mild limitation of elevation, but no ocular misalignment was detected in the primary position (Fig. 1).

The patient was evaluated for thyroid eye disease by the local physician, but the thyroid function tests came back normal. She was then referred to our clinic for further workup and orbital imaging. Orbital computed tomography (CT) scanning (Fig. 2) and magnetic resonance imaging (MRI) (Fig. 3) revealed oval-shaped cystic lesion located within the inferior rectus muscle, containing air-fluid level and

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https://doi.org/10.1016/j.ajoc.2024.102125
Received 9 February 2024; Received in revised form 21 June 2024; Accepted 12 July 2024
Available online 23 July 2024

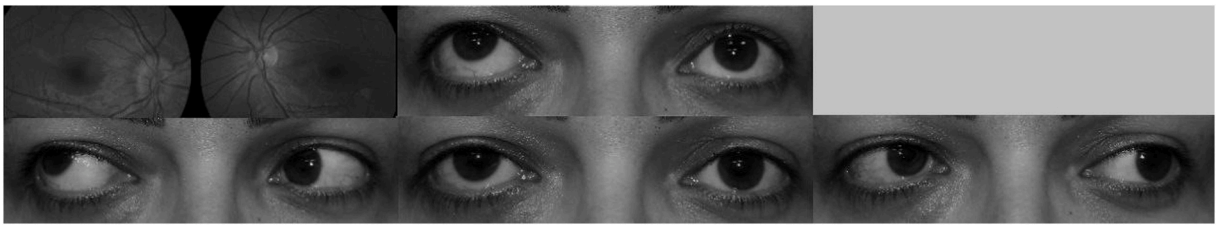

Fig. 1. Pre-operative photography of ocular movements. Fundus photography shows right optic disc swelling and face photos demonstrate right hyper-globus and inferior scleral show.

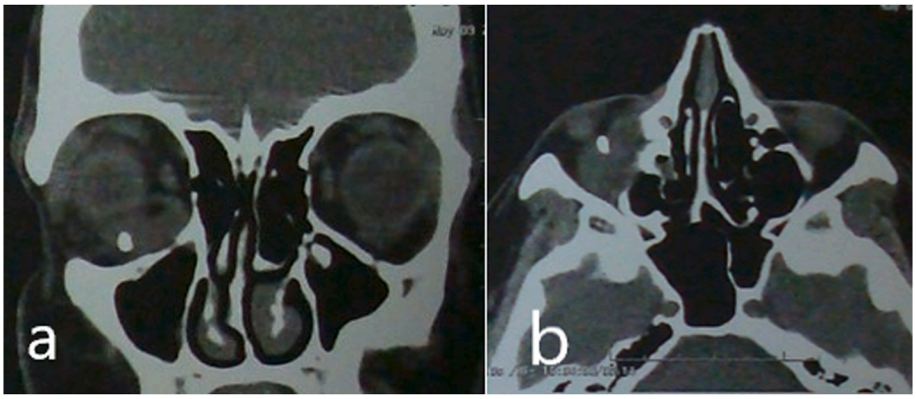

Fig. 2. Orbital CT scan demonstrating an oval cystic lesion in the region of the right inferior rectus muscle with an internal calcification, a, coronal view and b, axial view.

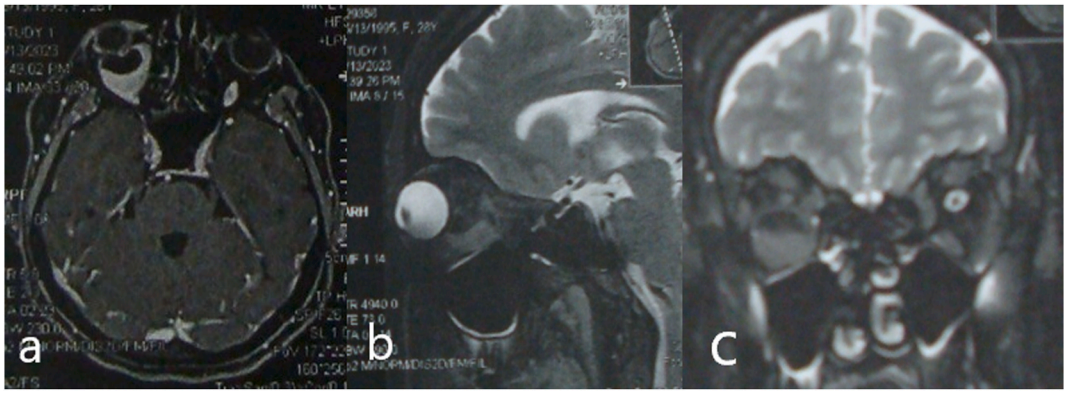

Fig. 3. Orbital MRI demonstrating a, T1 view with contrast showing the cyst containing an internal fat-fluid level and fluid enhancement (fat suppressed) and b, T2 view showing the cystic lesion in the inferior rectus muscle, and c, T2 coronal view demonstrating the fat-fluid level of the cyst inside the inferior rectus muscle.

evidence of calcification inside.

She was scheduled for an excisional biopsy under general anesthesia. The cyst was approached through an inferior transconjunctival incision. Intraoperative evaluation of the cyst materials revealed tissues of different embryonic origins such as hair, and foamy materials consistent with inflamed fat tissue in combination with keratinous materials, which was suggestive of a dermoid cyst. The cyst was excised completely and was sent to the lab for pathology, which confirmed the diagnosis of the orbital dermoid cyst.

Postoperatively, the proptosis and optic nerve head edema improved significantly. However, the patient had a small hypotropia in the right eye and experienced vertical diplopia in the primary position, probably due to post-operative inferior rectus inflammation, which resolved by week three. A small residual hypotropia persisted in the up-gaze, which was not bothersome. She remained asymptomatic in 6 months of follow-up, with no evidence of recurrence.

3. Discussion

This article presents a case of an orbital dermoid cyst involving the inferior rectus muscle. Orbital dermoid cysts are already considered rare congenital lesions, and an intraconal cyst involving muscles is even more unusual.[2] There have been only six reports of dermoid cysts in this unique location in the literature, among which, three were specifically identified within the intraconal compartment of the orbit,[4–6] while the remaining three had originated from the lateral rectus muscle.[2,3,7]

Intra-muscular dermoid cysts in the orbit can present various signs and symptoms depending on the location and size, including proptosis, diplopia, blurred vision, ocular motility restriction, and disturbance of ocular alignment.[3] The unique feature, in this case, was the involvement of the inferior rectus muscle, leading to ocular motility restriction, evident specifically in the up and left gaze. This finding highlights the importance of considering dermoid cysts as a potential differential diagnosis in cases of newly onset diplopia with a restrictive pattern. The

published reports on orbital dermoid cysts originating from the lateral rectus muscle also described similar clinical presentations.[3,7]

The diagnosis of a rectus muscle dermoid cyst can be challenging due to its rare occurrence and varied range of clinical presentations. Orbital CT scanning and MRI play a crucial role in diagnosis and can help evaluate the size and location of the cyst as well as the involvement of the adjacent orbital structure.[2] CT scans typically reveal well-circumscribed cystic lesions with fat attenuation, while MRI can provide additional information about the contents and the effect on the adjacent structures.[2] It should be mentioned that the presence of calcification within the cyst can be variable and some cysts can mimic other orbital lesions in imaging studies.[2]

Surgical removal is the standard treatment for orbital dermoid cysts and a complete excision is necessary to prevent recurrence. The surgical approach depends on the location and size of the cyst, ensuring adequate access for complete resection.[1,8] In some cases, minimally invasive approaches such as endoscopic or transconjunctival excision may be feasible.[1,2] In our case, a transconjunctival approach was employed which provided appropriate surgical access and minimized the risk of scarring and eyelid malposition.

Although post-operative complications are rare, they can include diplopia, ptosis, and globe displacement. In this case, the patient experienced mild headache, ocular surface irritation, and diplopia in the primary position, which resolved in the follow-up.

4. Conclusion

This report highlights the rarity and novelty of an inferior rectus dermoid cyst, a unique manifestation of a rare congenital orbital lesion, which was successfully managed with surgical excision.

5. Patient consent

Written consent to publish this case has been obtained from the patient.

Funding

No funding or grant support.

6. Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

CRediT authorship contribution statement

Mansooreh Jamshidian Tehrani: Supervision, Resources, Project administration, Data curation. **Arash Ghamar-Shooshtari:** Writing – original draft, Investigation. **Motahhareh Sadeghi:** Writing – review & editing, Supervision, Resources.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors have no conflict of interest.

Acknowledgements

None.

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