

## Medial Rectus Epithelial Inclusion Cyst after Strabismus Surgery and Review of the Literature

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### Abstract

**Background:** Extraocular muscle epithelial inclusion cysts can occur after several months to years of strabismus surgery. However, extraocular muscle epithelial inclusion cysts after strabismus surgery are rare. The incidence of sub-conjunctival epithelial inclusion cysts complicating eye surgery reaches about 0.25%. It usually presents a pink or purple-hued cystic mass under the conjunctiva and early excision is the most reliable treatment.

**Case presentation:** A 33 year-old woman was admitted to our hospital with a mass next to her nose that had occurred after a left medial rectus muscle strabismus diorthosis in 2007 and had lasted for 9 months. Ophthalmoscopy of the left eye revealed a purple-hued cystic mass under the nasal conjunctiva extending to the orbit with clear verge and slight congestion. Postoperative histopathological assessment revealed the presence of a medial rectus epithelial inclusion cyst.

**Conclusion:** Strabismus surgery can cause extraocular muscle epithelial inclusion cyst; meanwhile, early excision is the most reliable treatment.

**Keywords:** Epithelial inclusion cyst; Strabismus surgery

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### Case presentation

A 33 year-old woman was admitted to the Department of Ophthalmology of the Beijing Tongren Hospital, Capital Medical University in Beijing, People's Republic of China, with a mass next to her nose that had occurred after a left medial rectus muscle strabismus diorthosis in 2007 and had lasted for 9 months.

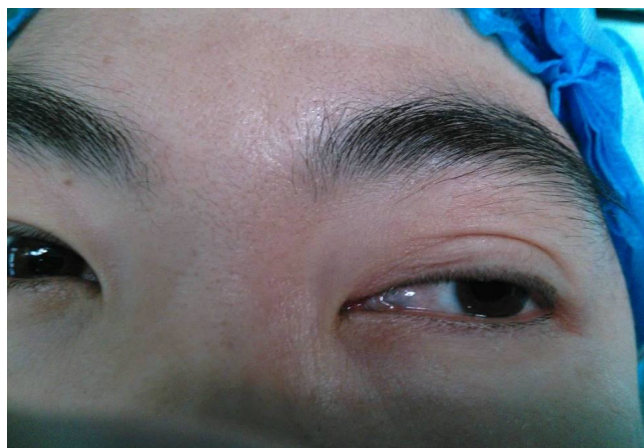
Ophthalmic examination yielded the following results: vision: OD: 20/40, OS: 20/40; intraocular pressure (IOP): OD: 15 mm Hg, OS: 15 mm Hg. Eye position and motion were normal. Slit lamp examination showed a purple-hued cystic mass nasally of the left eye, extending to the orbit with clear verge and slight congestion (Figure 1). Orbital magnetic resonance imaging (MRI) revealed a mass in front of the tendons and muscle belly of left medial rectus in long T1-weighted images (WI) and T2WI signal without enhancement (Figure 2). Orbital CT showed a long strip cystic lesion within the left medial rectus area, 15 × 15 × 14 mm, and the Hounsfield unit value was 5 to 20 (Figure 3).

The findings and therapeutic options were discussed with the patient, and it was decided that the best approach was to attempt excising the mass, followed by histopathologic

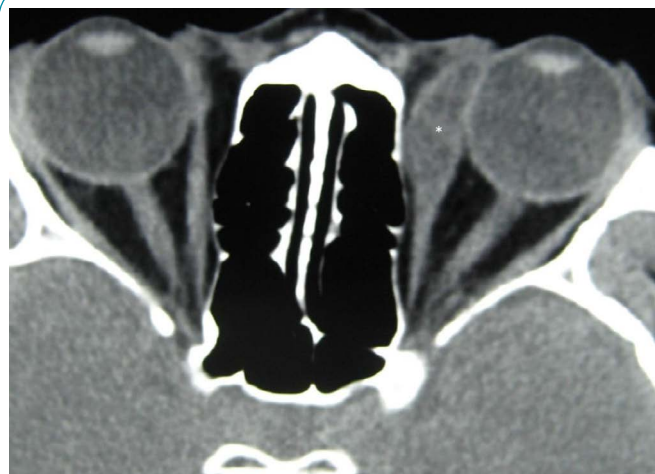
examination. Under general anesthesia and routine disinfection, a corneal limbus arc incision was made from 7 to 11 o'clock direction, and medial rectus fixed by the traction line to prevent damage. The cyst invaded the front of the tendons and muscle belly of left medial rectus, and was entirely removed (Figure 4). Histopathological examination revealed a squamous epithelium-covered conjunctival inclusion cyst. After surgical treatment, the patient regained normal eye appearance without diplopia and recurrence (Figure 5).

### Discussion

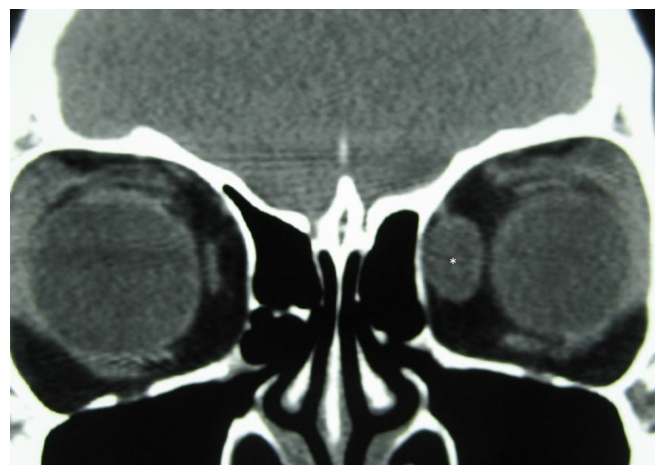
The incidence of secondary cyst is low, and sub-conjunctival epithelial inclusion cysts complicating eye surgery are comparatively higher, reaching about 0.25% [1]. Extraocular muscle epithelial inclusion cysts can occur after several months to years of strabismus surgery; 52 years is the longest time frame recorded so far [2]. It usually presents a pink or purple-hued



**Figure 1** Purple-hued cystic mass nasally of the left eye extending to the orbit with clear verge and slight congestion

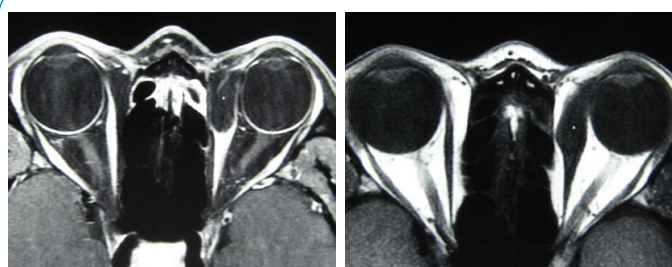


3A



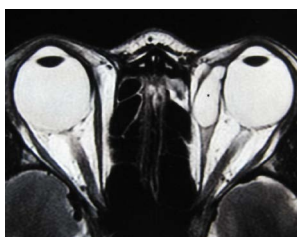
3B

**Figure 3** Orbital CT showing a long strip cystic lesion within the left medial rectus area, 15 × 15 × 14 mm; a Hounsfield unit value of 5 to 20 was obtained.



2A

2B



2C

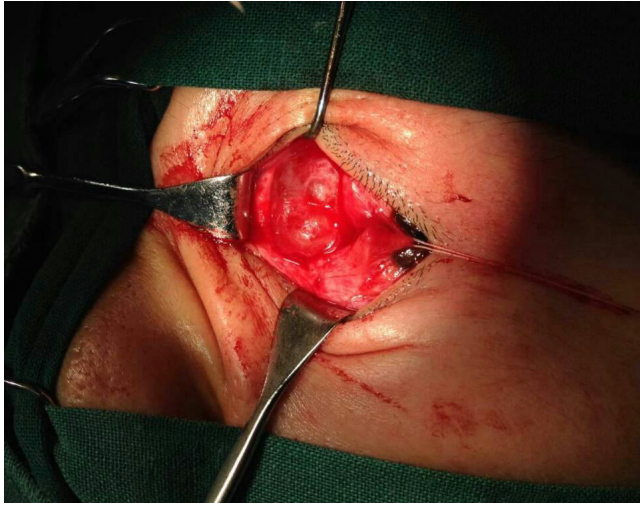
**Figure 2** Orbital MRI showing a mass in front of the tendons and muscle belly of left medial rectus in long T1-weighted images (WI) and T2WI signal without enhancement.

cystic mass under the conjunctiva, extending to the orbit with slight congestion, foreign body sensation and disturbance of eye movement [3]. Extraocular muscle epithelial inclusion cysts after strabismus surgery involve not only the sub-conjunctival tissue but also the affected extraocular muscles. According to the surgical sites, the cyst locations within the involved muscles can differ, e.g. front end, inside, between the muscle and sclera. Sub-conjunctival epithelial cell implantation within the muscle (probably the case in the patient described here) formed by the needle while suturing the muscle in its new scleral insertion is the most likely pathophysiological explanation of cyst formation. During the primary surgery, careful retraction of conjunctiva and tendon tissue from scleral tunnels can help prevent cyst formation. In the case presented here, the patient had a history of left medial rectus muscle strabismus diorthosis 7 years prior to the study, combining pathologic results, which finally confirmed the diagnosis.

Sub-conjunctival epithelial inclusion cysts can happen after ocular trauma, cataract operations, pterygium resections, etc. [4]. The differential diagnosis of a cystic mass in the orbit includes dermoid cyst, lymphangioma, inflammatory cyst, and parasitic cyst [5,6]. Dermoid cysts and lymphangiomas are mostly congenital lesions with slow growth and no surgery or trauma history. However, parasitic cysts often have regional characteristics.

Imaging can provide important clues for the diagnosis of this lesion. Scanning of the mass can show the lesion properties and range, and provide the relationships between lesions and the surrounding tissues. Gross appearance of our patient showed the mass located in sub-conjunctival was not large, but imaging examination revealed a wide range. Orbital MRI revealed the involvement of tendons and muscle belly of left medial rectus in long T1-weighted images (WI) and T2WI signal. Orbital CT showed a long strip cystic lesion within the left medial rectus area, which measured 15 × 15 × 14 mm.

Many forms of treatments have been described for this disease, including laser photo-ablation, thermal cautery, isopropyl



**Figure 4** The corneal limbus arc incision was made from 7 to 11 o'clock direction. The mass invaded the front of the tendons and muscle belly of left medial rectus.

alcohol injection and surgical resection. However, surgical resection remains the most effective and safe method to remove conjunctival cysts. Non-surgical treatments are usually reserved for clearly diagnosed cysts with smaller diameter, good exposure and no overt adhesion of the surrounding tissues. Laser photocoagulation requires multiple treatment and pigmentation; in thermal cautery, more attention should be paid to the protection of the surrounding tissue [7]. Isopropyl alcohol injection is mainly suitable for small and superficial cysts; in addition, doctors must



**Figure 5** After surgical treatment, the patient regained normal eye appearance without diplopia and recurrence

have considerable experience to ensure the integrity of cysts. Only surgical methods can repair the large secondary incomitant strabismus associated with many giant conjunctival cysts and definite pathological diagnosis. Extraocular muscles traction lines are important. If the cyst forms between the muscle and sclera, the two might be detached from each other, leading to the formation of a pseudo-tendon between sclera and muscle. Removing the cyst will lead to loss of the rectus muscle inside the orbit. Therefore, our patient decided that attempt should be made to excise the mass; the medial rectus was fixed by traction line during surgery. After surgical treatment, the patient regained normal eye appearance without diplopia and recurrence [8,9].

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