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Postsurgical Conjunctival Epithelial Cysts

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Summary: MR appearance of two patients with large, orbital conjunctival epithelium-lined inclusion cysts are presented. Both were complications of ophthalmic surgical procedures that necessitated conjunctival incision.

Index terms: Orbits, cysts; Orbits, magnetic resonance; Surgery, complications

Large conjunctival epithelial inclusion cysts are rare and can occur after various ophthalmic surgical procedures. We describe two cases of conjunctival epithelial inclusion cysts, one developing within a lateral rectus muscle after scleral buckling procedure for retinal detachment and the other in an anophthalmic orbit after enucleation.

Case Report

Case 1

A 76-year-old white man presented with painless proptosis of the right eye. He had a scleral buckling procedure for a rhegmatogenous retinal detachment in that eye 18 years ago. The surgery had required disinsertion and reinsertion of the lateral rectus muscle. On examination of the right eye, a slight proptosis with resistance to retropulsion was noted. No palpable mass was identified. Marked restriction in all fields of gaze was found.

Magnetic resonance (MR) (Fig 1) revealed a large multiloculated cyst measuring approximately $4.5 \times 3.0 \times 2.8$ cm within the belly of the right lateral rectus muscle slightly displacing the orbital globe and the optic nerve anteromedially. The lesion was slightly hypointense relative to muscle on short-repetition time (TR)/echo time (TE) (500/16/2 excitations) images. It showed markedly hyperintense signal relative to muscle on long-TR/TE (2467/90/1) images. The lesion was isointense relative to vitreous on long-TR/short-TE (2467/30/1) images and moderately hyperintense relative to vitreous on long-TR/TE (2467/90/1) images. The walls and septations of the mass lesion were thin and smooth without nodularities and enhanced slightly after the administration of intravenous gadolinium.

The patient underwent excision of the lesion. Histopathologic analysis revealed that the cyst was lined by stratified squamous nonkeratinized epithelium resembling conjunctival epithelium. No adnexal structures were found. These findings were consistent with a conjunctival epithelial inclusion cyst.

Case 2

A 17-year-old white boy presented for evaluation of possible replacement of his right orbital implant with a hydroxyapatite type. The patient had undergone enucleation for unilateral sporadic retinoblastoma at the age of 23 months with subsequent placement of an implant in the orbit. On examination, we noted the right orbit to be slightly proptotic. After removal of the external prosthesis, we found a large cystic mass filling the entire anterior orbit. The ball implant could not be identified by either touch or sight.

MR (Fig 2) revealed a large cyst in the right orbit measuring approximately $3.0 \times 1.8 \times 1.6$ cm and filling the space normally occupied by the globe. The spherical implant was pushed superomedially. The lesion was isointense to muscle on short-TR/TE (550/23/2) images and markedly hyperintense relative to muscle on long-TR/TE (1800/80/2) images. It was isointense relative to vitreous on long-TR/short-TE (1800/40/2) and long-TR/TE (1800/40/2) images. No septations or nodularities were identified within the lesion, which showed possible slight enhancement of its wall after the intravenous administration of gadolinium.

The lesion was excised. Histopathologic evaluation revealed a conjunctival epithelial inclusion cyst.

Discussion

Conjunctival epithelial cysts are benign lesions lined by nonkeratinizing squamous epithelium with scattered mucus-producing goblet cells and without adnexal appendages within their walls (1). They are classified as primary or secondary. Primary conjunctival epithelial cysts are consid-

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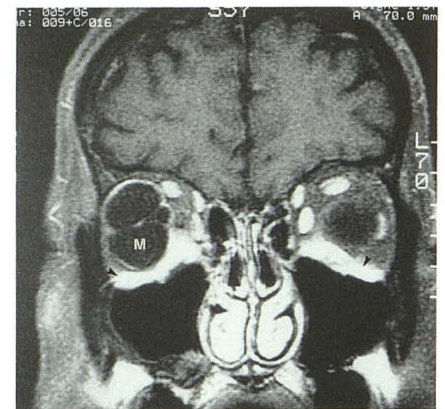
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Fig. 1. Conjunctival epithelial inclusion cyst after scleral buckling.

A and B, Axial MR images through the midorbital level reveals a large, well-circumscribed, thin-walled, multiloculated mass (*M*) within the belly of the right lateral rectus muscle slightly displacing the globe and the optic nerve (*arrow*) anteromedially. It is slightly hypointense relative to muscle on the short-TR/TE (500/16/2) image (*A*) and markedly hyperintense relative to muscle on the long-TR/TE (2467/90/1) image (*B*). The lesion is isointense with vitreous on the long-TR/short TE (2467/30/1) image (not shown) and moderately hyperintense relative to vitreous on the long-TR/TE image (*B*). *Arrowheads* indicate the scleral buckling (360° scleral silicone band). The prominent hyperintense area around the posterior aspect of the left globe and to a lesser extent in the posterior aspect of the right globe in *B* represents chemical-shift artifact in the frequency axis related to narrow bandwidth.

C, Axial and D, coronal short-TR/TE (500/16/2) images after intravenous administration of gadolinium and with fat-suppression technique show slight enhancement of the wall and septations of the mass. The high-signal areas in the medial retrobulbar space (*arrowheads*, C) and along the floor of both orbits (*arrowheads*, D) represent fat-suppression failure artifacts at magnetic-susceptibility interfaces between lower part of orbital fat and upper portion of maxillary sinus. These artifacts occur along the static-field (*z*) direction on frequency-selective fat-suppression MR images.



D

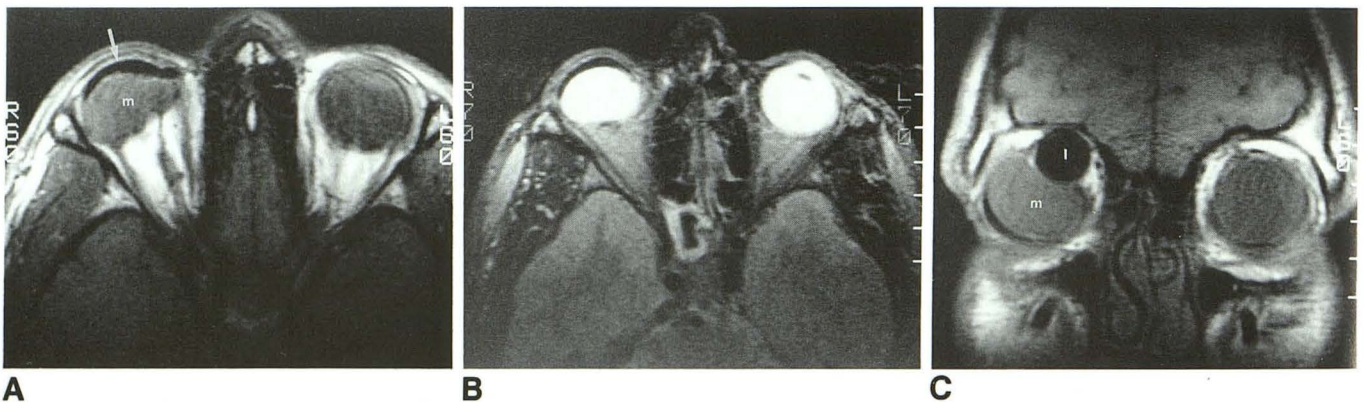


Fig. 2. Postenucleation conjunctival epithelial inclusion cyst.

A and B, Axial MR sections through the midorbital level show a large, well-defined, thin-walled mass (*m*) mimicking the globe in position within the right orbit. It is isointense relative to muscle on the short-TR/TE (550/23/2) image (*A*) and markedly hyperintense relative to muscle on the long-TR/TE (1800/80/2) image (*B*). The lesion is isointense relative to vitreous on the long-TR/short-TE (1800/40/2) (not shown) and long-TR/TE images (*B*). The prosthesis (*arrow*) is immediately anterior to the mass.

C, The ball implant (*I*) is displaced superomedially by the mass (*m*) on the short-TR/TE (550/23/2) coronal image.

D, Possible slight enhancement of the mass wall is noted on the short-TR/TE (550/23/2) axial image after the intravenous administration of gadolinium and with fat-suppression technique.



D

ered developmental despite their frequently late appearance in life. They are usually confined to the superomedial orbital soft tissues without bone erosion. These cysts probably result from sequestration of conjunctival epithelium during embryonic development (2). Secondary conjunctival epithelial or inclusion cysts are much more common than the primary type and develop after displacement of conjunctival epithelium into the orbit spontaneously (idiopathic) or after surgery, trauma, or inflammation (1, 2).

Postsurgical conjunctival epithelial inclusion cysts of the orbit are rare. Although occurring most frequently after enucleation, they may be seen in any surgery involving the orbit with conjunctival incision or conjunctival surgical insult. The interval from an orbital surgery to the formation of a clinically detectable cyst is variable, with a reported range of 3 months to 28 years (3, 4). This entity typically presents clinically with proptosis.

The pathogenesis of the conjunctival epithelial inclusion cysts after an orbital surgery is not entirely clear, but various mechanisms have been suggested. These mechanisms include drawing of a conjunctival suture through deeper tissues, implantation of a free fragment of conjunctiva within deeper tissues, and conjunctival epithelial down-growth (5–7). The displaced conjunctival epithelium then proliferates within the underlying orbital tissues and grows by the secretions of inverted epithelial cells and by the degeneration and desquamation of the innermost cells.

In our first case, the large conjunctival epithelial inclusion cyst developed within the right lateral rectus muscle after scleral buckling for a retinal detachment. Its size and location were unusual. The conjunctival epithelial inclusion cyst after scleral buckling is usually small and located on the bulbar or palpebral conjunctiva (2, 8). The patient's retinal-detachment surgery 18 years ago had required disinsertion and reinsertion of the right lateral rectus muscle. Implantation of the conjunctival tissue probably occurred during manipulation of that muscle.

In our second case, the large conjunctival epithelial cyst occurred 15 years after an enucleation and occupied the space normally of the globe. The displaced conjunctival epithelium probably lined the Tenon capsule and subsequently formed a cyst mimicking the globe.

MR is the modality of choice for demonstrating the cystic nature of masses. A conjunctival epithelial inclusion cyst appears as a thin-walled,

well-circumscribed, uniloculated or multiloculated lesion with a nonenhancing lumen. It typically has a hypointense or isointense signal relative to muscle on the short-TR/TE images and a markedly hyperintense signal relative to muscle on the long-TR/TE images. However, depending on the concentration of its contents, the signal characteristics of a conjunctival epithelial inclusion cyst may vary.

Differential diagnosis includes conjunctival dermoid, epidermoid, and dermoid (cutaneous), hematocele, parasitic cyst, mucocele, dentigerous cyst, lymphangioma, and cavernous hemangioma (2, 3). Conjunctival dermoids are mostly developmental and have thicker walls, which contain adnexal structures and varying inflammatory reaction. Epidermoids and dermoids (cutaneous) are cysts lined by keratinizing epithelia without and with adnexal structures, respectively. They typically occur in the superolateral aspect of the orbit with an associated defect in the orbital rim (1). Hematoceles are masses composed of blood or blood products which can be depicted readily on MR. Parasitic cysts are rare in the United States, and clinical history is helpful to make the diagnosis. Mucoceles involve paranasal sinuses with possible associated destruction of the adjacent orbital bones and herniation of the cysts through the bony defects into the orbits. Dentigerous cysts contain unerupted teeth. Lymphangiomas are usually diffuse, poorly circumscribed, and heterogeneous. Cavernous hemangiomas have a variable enhancement after intravenous gadolinium on MR.

The appearance of an orbital cystic lesion after an orbital surgery should raise the diagnosis of a conjunctival epithelial inclusion cyst.

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