SHORT COMMUNICATION

Case report

Orbital lipogranuloma after sinus surgery

M. ROSNER, S. KURTZ, M. SHELAH, N. ROSEN

Goldschleger Eye Institute, Sackler School of Medicine, Tel-Aviv University, Sheba Medical Center, Tel-Hashomer - Israel

INTRODUCTION

Functional endoscopic sinus surgery (FESS) has become a widely accepted procedure for the treatment of chronic inflammatory paranasal sinus disease (1). One of the most feared, but fortunately less frequent complications, is partial or complete visual loss. This can be the result of direct injury to the optic nerve during surgery or intraorbital expansion of hematoma in cases with perforation of the orbital wall, especially of the thin lamina papyracea (2). We present here another ophthalmic complication of this operation: an orbital lipogranuloma that caused proptosis and diplopia.

Case reports

Case 1

A 17-year-old man was referred to our department two weeks after FESS done under local anesthesia for removal of infected maxillary and ethmoidal polyps. No oily material had been injected or inserted during the FESS procedure. On referral, he suffered from proptosis of the right eye, diplopia and a hard swelling involving the lower eyelid. On examination a hard mass was noted in the lower right eyelid (Fig. 1), with proptosis and upward displacement of the globe. Eye movements were impaired with severe restriction of the downward gaze. Corrected visual acuity was 6/8.5 in his right eye and 6/6 in the left eye. Applanation tonometry was 15 mm Hg in both eyes. The conjunctiva of the right eye was hyperemic and mild chemosis was noted. The cornea and anterior chamber were unremarkable. The pupils were round and equal with no relative afferent papillary defect. The right optic nerve head, macula and retina were normal. The result of examination of the left eye was unremarkable. CT examination detected fullness of the right inferior orbit causing upward displacement of the globe (Fig. 2).

The mass in the lower lid and lower part of the or-
Orbital lipogranuloma

Orbital lipogranuloma bit was initially diagnosed as persistent hematoma due to the FESS procedure, but at follow-up examination there was no improvement in the clinical condition or the CT scan. Thus a right inferior orbitotomy was performed three weeks after the FESS; a hard mass was exposed and incision of this tissue revealed oily spaces. Extensive debulking of this tissue was carried out. Histopathological examination indicated a diffuse lipogranulomatous reaction with multiple rounded, microscopic empty spaces consistent with fat. The spaces were surrounded by an extensive epithelioid reaction associated with multiple foreign-body, multi-nucleated giant cells (Fig. 3).

Oral steroids (prednisone) and antibiotics (augmentin) were administered after the operation. At follow-up marked improvement was noted. Although minimal residual swelling still persisted three months later, visual acuity had returned to 6/6, there was no proptosis or restriction of ocular movements and no diplopia (Fig. 4).

Case 2

A 31-year-old woman had FESS and bilateral turbinectomy under local anesthesia for chronic rhinosinusitis. The procedure was reported to be uneventful. No oily material was injected or inserted during the FESS procedure. Within two days of surgery she developed edema of the right eyelids, slight proptosis with lateral displacement of the globe, limitation of eye movements and diplopia. CT scans on the first
and second days after surgery found lateral displacement of the medial rectus muscle by an infiltrating mass. Ten days after surgery, while still in the ENT department, FESS was repeated under local anesthesia with the aim of removing a hematoma which was believed to be causing the condition. During surgery loss of the lamina papyracea was found and blood clots were removed. Again, no oily material was used, injected or inserted in the surgery field during this procedure.

Antibiotics and steroids were given, but as no improvement was seen after four weeks, the patient was scheduled for eyelid and orbital surgery.

Ophthalmological examination after the second FESS surgery found a hard swelling of the upper and lower lids of the right eye (Fig. 5), exotropia and limitation of elevation of the right eye. Visual acuity was 6/6 for both eyes. The applanation tonometry measurement was 16 mm Hg in both eyes. The pupils were round and equal with no relative afferent pupillary defect. The remainder of the examination was unremarkable with normal optic nerve, macula and retina. Repeated CT scan found an infiltrating mass in the medial part of the orbit and the eyelids (Fig. 6).

The mass, which was located in the upper lid and medial part of the orbit, was approached though a lid crease incision, and the lower lid was entered through an infra-lash incision. Yellowish, hard masses were revealed, showing oily vacuoles when incised. These masses were meticulously debulked. Histopathological examination indicated a diffuse lipogranulomatous reaction with multiple microscopic, rounded, empty spaces consistent with fat, surrounded by an extensive epithelioid reaction associated with multiple foreign-body, multinucleated giant cells, similar to those seen in the tissue removed from the first patient.

After surgery the patient was treated with oral steroids (prednisone) and antibiotics (augmentin) for one week. At follow-up examinations, she presented dramatic improvement. The swelling of the eyelids, the proptosis and the diplopia had subsided. However, some hard swelling of the medial part of the right lower eyelid was still noted a month after the last surgery (Fig. 7).
DISCUSSION

FESS is usually a safe procedure, but it may cause serious ocular side effects due to inadvertent penetration into the orbit. This happens more commonly when the procedure is performed under general anesthesia.

Such inadvertent penetration into the orbit can cause direct trauma to the globe or to the optic nerve or indirect involvement caused by intraorbital hemorrhage (3). An expanding hemorrhage may increase intraorbital pressure and cause hypoxia of the optic nerve. In these cases immediate orbitotomy is mandatory (3).

Proptosis and eyelid swelling after orbital surgery is usually due to hemorrhage, intraorbital cyst formation or infection. In the cases described, proptosis, eyelid swelling and diplopia developed as a consequence of an extensive lipogranulomatous reaction to extruding orbital fat after the FESS procedures.

Orbital lipogranuloma is described as a local histiocytic response to extracellular lipid or alloplastic material, including silicone and paraffin (4-6). It has been demonstrated as secondary to a ruptured dermoid cyst (4). It is interesting to note that a lipogranulomatous response is usually not seen after orbital surgery for removal of intraorbital tumors or after decompression surgery for thyroid ophthalmopathy. This suggests that the lipogranulomatous reaction in the cases described after FESS surgery were triggered by hemorrhage that caused necrosis of the orbital adipose tissue and accumulation of free extracellular fat. However, there was no evidence of such hemorrhage, either in the form of red blood cells or blood breakdown products, in the specimens examined. On the other hand, as no oily material had been injected or inserted during the FESS procedures, there was no exogenous source of the lipid that caused the granulomatous reaction.

In summary, these two cases of extensive orbital and eyelid lipogranuloma causing proptosis and diplopia represent a rare complication of endoscopic sinus surgery which did not resolve spontaneously but was relieved by debulking surgery.

ACKNOWLEDGEMENTS

We would like to thank Tzvi Friedman, the medical photographer of the Goldschleger Eye Institute, for helpful photographic assistance.

REFERENCES