

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

PURPOSE. *To report the treatment and histopathological findings in two cases who developed eyelid swelling, proptosis and diplopia due to orbital and lid lipogranuloma after endoscopic surgery of the maxillary and ethmoidal sinuses.*

METHODS. *To relieve the proptosis and diplopia, debulking surgery was done on the eyelids and orbit. The tissue removed was sent for histopathological examination.*

RESULTS. *The two patients improved after surgery. The eyelid swelling, proptosis and diplopia subsided and ocular movements became normal. Histopathologic examination disclosed an extensive lipogranuloma.*

CONCLUSIONS. *Extensive orbital and eyelid lipogranuloma causing proptosis and diplopia is a rare complication of endoscopic sinus surgery, and can be relieved by surgical debulking. (Eur J Ophthalmol 2000; 10: 183-6)*

KEY WORDS. *Lipogranuloma, Orbit, Eyelid, Proptosis, Functional endoscopic sinus surgery (FESS)*

Accepted: October 18, 1999

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 eye lid (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 pupillary 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-



Fig. 1 - The clinical presentation of the first patient, two weeks after the FESS procedure. There was swelling of the right lower lid causing upward proptosis.

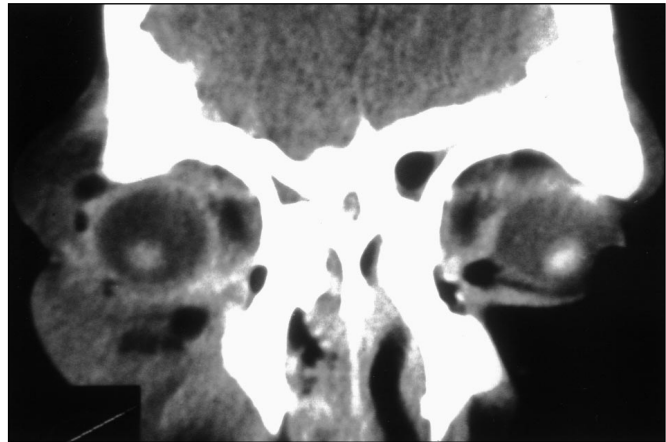


Fig. 2 - CT scan examination of the first patient: fullness is seen in the right inferior orbit.

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

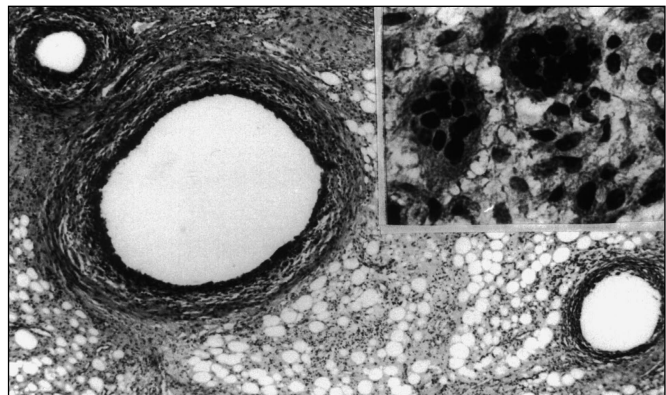


Fig. 3 - Histopathological section of the excised specimen from the lower eyelid and orbit, with a diffuse lipogranulomatous reaction and multiple rounded, empty spaces consistent with fat, surrounded by an extensive epithelioid reaction (hematoxylin and eosin, original magnification x 40). (Inset) High magnification of the multiple foreign-body, multi-nucleated giant cells associated with the reaction (hematoxylin and eosin, original magnification x 400).

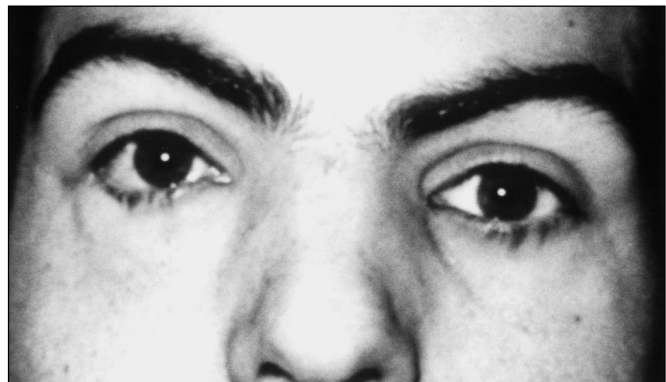


Fig. 4 - The right eye of the first patient, three months after debulking surgery: minimal residual swelling still persists but there is no proptosis or restriction of ocular movements.



Fig. 5 - The clinical presentation of the second patient after FESS surgery. There was swelling of the right upper and lower lids, and exotropia of the right eye.

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 through 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

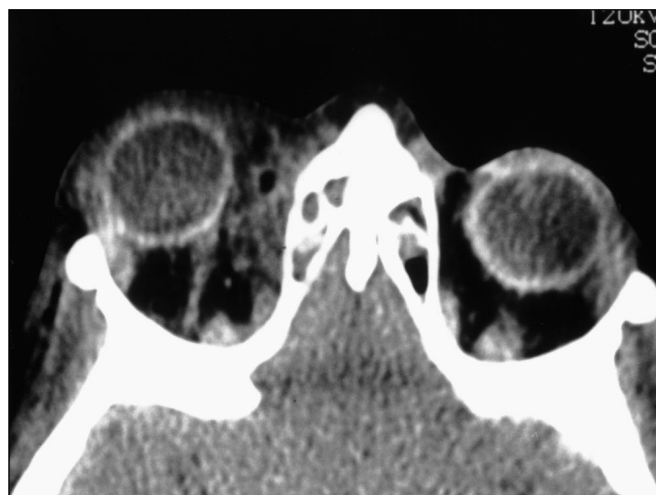


Fig. 6 - CT scan examination of the second patient, showing an infiltrating mass in the medial part of the orbit and the eyelids.

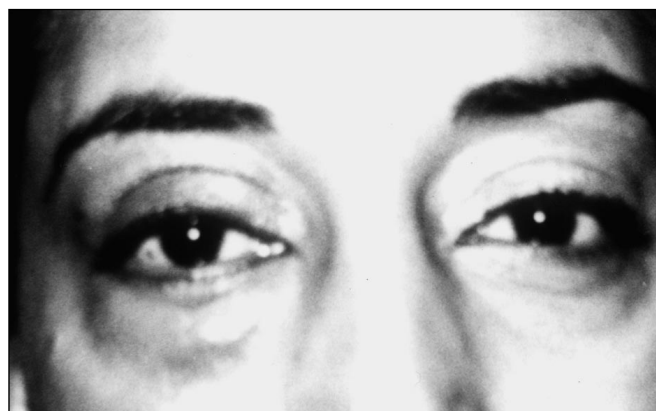


Fig. 7 - The second patient's right eye, one month after debulking surgery: there is still minimal residual swelling of the medial part of the right lower eyelid but no proptosis or restriction of ocular movements.

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.

Reprint requests to:
Mordechai Rosner, MD
Eye Histopathology Laboratory
Goldschleger Eye Institute
Sheba Medical Center
Tel Hashomer 52621, Israel
e-mail: mrosner@post.tau.ac.il

REFERENCES

1. Kennedy DW. Functional endoscopic sinus surgery. *Arch Otolaryngol* 1985; 111: 643-9.
2. Vanden Abeele D, Clemens A, Tassignon MJ, van de Heyning PH. Blindness due to electrocoagulation following functional endoscopic sinus surgery. *J Laryngol Otol* 1996; 110: 261-4.
3. Maniglia AJ. Fatal and other major complications of endoscopic sinus surgery. *Laryngoscope* 1991; 101: 361-6.
4. Jakobiec FA, Bilyk JR, Font RL. Orbit. In: Spencer WH, Bilyk JR, Eagle RC, et al, eds. *Ophthalmic pathology*, 3rd ed. Philadelphia: WB Saunders, 1998; chap. 12.
5. Rees TD, Ballantyne DL, Seidman I. Eyelid deformities caused by the injection of silicone fluid. *Br J Plast Surg* 1971; 24: 125-8.
6. Boynton JR, Searl SS, Heimer JL, Miller EA. Eyelid oleogranuloma caused by petroleum jelly injection. *Arch Ophthalmol* 1988; 106: 550-1.