Mucocele of the pterygoid recess treated by laser surgery

Case report

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Mucocles arising from accessory paranasal sinuses about the orbit are quite rare. A case is reported of a retro-orbital mucocele arising from the pterygoid recess of the sphenoid sinus. The clinical and anatomical presentations, computerized tomographic and magnetic resonance imaging characteristics, and laser surgical management of such lesions are described.

Key Words • mucocele • pterygoid recess • laser surgery

CASE REPORT

This 23-year-old woman presented with a 7-month history of a progressive mild proptosis of the left eye. Mild left retro-orbital headaches were also noted. The proptosis was associated with blurring of vision in the left eye and double vision on upward gaze. There was no history of trauma or recurrent sinus infection.

Examination

The patient had mild proptosis of the left eye with full range of motion in all directions. Visual acuity was normal, as were the optic discs. No neurological abnormalities could be demonstrated. Skull x-ray films were without definite abnormality. Computerized tomography (CT) scans in the axial and coronal projections demonstrated a large lesion apparently originating near the base of the skull in the region of the left foramen rotundum. The lesion extended through the sphenoid bone into the lateral aspect of the left orbit and the middle cranial fossa. There was extensive bone destruction and remodeling in the posterior aspect of the pterygoid fossa as well as the medial aspect of the sphenoid wing. The entire lateral wall of the orbit was eroded, and the lesion extended into the orbit displacing the optic nerve medially (Fig. 1). The CT appearance of the lesion did not change after administration of contrast medium. Carotid angiography revealed displacement of the left middle cerebral artery from the floor of the middle fossa by an extra-axial mass. Magnetic resonance imaging (3.5 tesla, superconducting Siemens unit) clearly showed the soft tissue characteristics of the lesion and its intracranial extent. The lesion appeared to contain fluid, as its imaging characteristics were similar to those of cerebrospinal fluid (Fig. 2).
Pterygoid recess mucocele

To better delineate the nature of the lesion and to guide further therapy, a CT-guided needle biopsy was performed through the defect in the lateral orbital wall. Aspiration of 30 cc of green mucoid material resulted in significant reduction of the proptosis. Cytology of the fluid was negative and cultures were sterile.

Operation

The lesion was entered through a small left fronto-temporal craniotomy. An incision was made in the wall of the lesion where it had eroded the sphenoid wing, and a large quantity of green mucoid material was evacuated. The confines of the lesion were identified: the lesser and greater wings of the sphenoid and the lateral orbital wall were eroded; the periorbita was displaced medially and the temporal dura posteriorly. The lesion was arising from an isolated air sinus in the medial sphenoid wing. A carbon dioxide laser at 40 watts was used to score all involved surfaces to completely obliterate the lining of the lesion.

Postoperative Course

The patient's postoperative recovery was uneventful. The proptosis resolved over 3 to 4 days and has not recurred. Pathological examination of the lesion demonstrated cortical bone associated with dense fibrous tissue covered by respiratory epithelial cells believed to be consistent with a mucocele. Follow-up CT scans at 3 and 6 months and at 1 year have shown no evidence of recurrence.

Discussion

Orbital mucoceles arise from the paranasal sinuses, primarily from the frontal or ethmoidal sinuses and rarely from the sphenoid sinus. Mucoceles result from obstruction of the sinus ostium, which may occur secondary to inflammation, fibrosis, trauma, previous surgery, or mass lesions such as osteomas. Continuous secretion of mucus by the isolated sinus mucosa results in an expanding mass which causes bone erosion and potential neuro-ophthalmological symptoms.

Frontoethmoidal sinus mucoceles characteristically present as painless proptosis with inferolateral displacement of the globe. Diplopia is caused by a mechanical limitation of globe motion and occurs in almost half of the cases. Mucoceles of the sphenoid sinus tend to produce more pronounced cranial nerve compression, and optic, oculomotor, and abducent neuropathies are common.

Retro-orbital and lateral orbital mucoceles are quite uncommon. In the only previously documented case, Diaz, et al., reported an 11-year-old child who presented with progressive proptosis, visual loss, and facial swelling. The mucocele in that case resulted in erosion of the greater and lesser wings of the sphenoid, as well as the floor of the orbit and the most anterior portion of the middle fossa. At operation, the origin of the mucocele could not be defined; however, it was postulated that the lesion arose from an aberrant sinus. The degree of bone destruction by the mucocele in that case was virtually identical to that in our patient. However, in our case, the mucocele originated from an isolated air sinus in the remaining portion of the greater sphenoid wing.

It has been well documented that an inferior lateral recess of the sphenoid sinus (the pterygoid recess) may extend into the greater wing and lingula of the sphenoid bone. A significantly enlarged pterygoid recess has been found in 17% of normal skulls. Anatomically, the pterygoid recess may extend up to 15 mm from the body of the sphenoid and, in some instances, as far laterally as the foramen ovale. The floor of the middle fossa may be aerated in up to 10% of the normal.
population. We postulate that the mucocele in this case arose from an isolated pterygoid recess in the greater sphenoid wing.

Computerized tomography scanning has become the procedure of choice in evaluating the character and extent of mucoceles. Mucoceles characteristically appear as homogeneous isodense lesions that do not enhance with injection of contrast medium. Infected mucoceles or pyoceles have been reported to show rim enhancement. Computerized tomography scanning in both coronal and axial planes will delineate the extent of bone involvement as well as the degree of intraorbital and/or intracranial extension. There are no previous reports of the magnetic resonance imaging characteristics of mucoceles; however, in the present case, the fluid contents of the lesion could be well defined. This may be extremely helpful in differentiating mucoceles from other intraorbital mass lesions.

In the present case, a CT-guided needle biopsy proved quite useful in establishing the nature of the lesion and in guiding therapy. However, although aspiration with resolution of proptosis is possible, definitive therapy requires total surgical ablation of the lesion to avoid repeated recurrence. The surgical approach depends on the exact location of the lesion and whether there is associated intracranial extension. Regardless of the approach, effective therapy requires obliteration of all sequestered sinus mucosa or the lesion will recur. In this case, the carbon dioxide laser proved quite effective in the complete obliteration of the sinus mucosal lining of the mucocele. The laser was especially useful in removing adherent mucosa from the periorbital and temporal dura without damaging these structures. With the aid of the operating microscope, the laser can be directed to otherwise inaccessible areas to effect a complete cure of the lesion.

References


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