SINO-ORBITAL DISEASE

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ANATOMY

The orbital septum is an important anatomic barrier in the eyelids that prevents contiguous spread of infection posteriorly from the eyelids into the orbital tissues. The septum is a thin fibrous layer arising from the periosteum along the inferior and superior orbital rims which fuses into the upper and lower eyelid retractors (Figure 1). By definition, tissues anterior to the septum are part of the eyelids, and tissues posterior to the septum are in the orbit. Infectious processes in the orbit can rapidly spread to involve extraocular muscles and cranial nerves. Any mass effect from orbital infection or inflammation can lead to proptosis, an anterior displacement of the eye. Most orbital infectious problems arise from the sinuses by contiguous spread. Unlike preseptal infections involving the eyelids, which are predominantly caused by gram-positive bacteria, orbital infections are often caused by fungi or a mixed bacterial etiology.

DIAGNOSIS

Radiographic imaging of the orbit and paranasal sinuses is invaluable for both the initial evaluation and for monitoring disease progression and response to treatment. In addition, detailed radiologic study is mandatory for surgical planning. Both computed tomography (CT) and magnetic resonance imaging (MRI) play a role in defining the extent of the infectious process. MRI provides details of the soft tissue anatomy of the orbit and intra-cranial structures superior to that of CT. Also MR with contrast can provide vascular images including the carotid and cavernous sinus. On the other hand, CT provides superior imaging of bone and infectious masses (e.g. fungal balls) within the sinuses. Both axial and coronal high-resolution images by CT or MRI should be obtained (Figures 2,3,4,5). Coronal images can be obtained by MR without special positioning of the head, which may be advantageous in obtunded or non-cooperative patients. In contrast, CT coronal images require neck flexion, which is not always feasible, in severely ill patients CT and MRI often provide complementary information, and patients should be evaluated by both techniques; subtle findings on MR may not be seen by CT and vice versa.

Often bedside nasal debridement can provide an adequate tissue specimen for study circumventing more invasive procedures. Samples can be obtained from the septum, lesions on mucus membranes, material aspirated from sinuses, bronchial washings, or aspirated material from abscesses. Multiple biopsies should be taken.[125] Once collected, samples should be taken to the laboratory immediately due to the fastidiousness of many microorganisms especially zygomycetes, which do not survive more than a few hours at refrigerator temperature. The microscopic demonstration of zygomycetes in KOH mounts or stained smears is more significant than their isolation in culture. Culture media should be inoculated with as large a specimen as is feasible.

Figure 1. Normal anatomy of the eyelid.

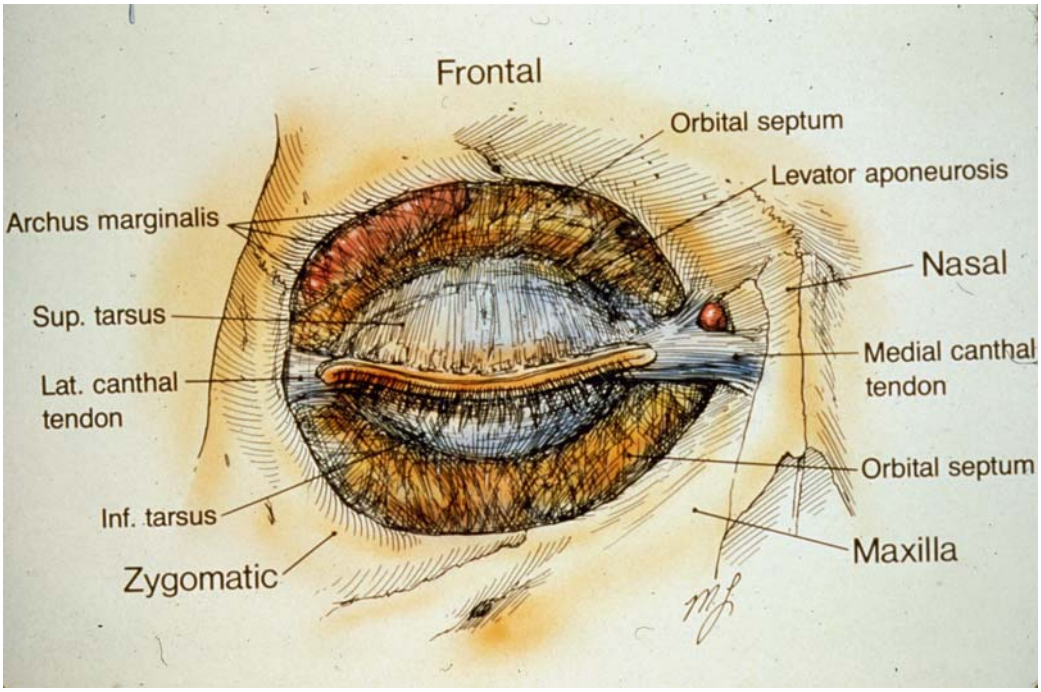

Figure 2. Sinus Aspergilloma with orbital extension. Note the proptosis and temporal displacement of the left eye.

Figure 3. Coronal CT image of patient in figure 10. Note calcification in maxillary-ethmoid mass highly suggestive of aspergilloma.

Figure 4. Coronal CT image of a patient with bilateral aspergilloma with extension into the orbits.

Figure 5. MR image of the same patient shown in figure 10. More soft tissue details can be viewed as compared to CT (Figure 11)