3.8 Sinus Inflammations

Sinus inflammations (sinusitis) generally develop in association with rhinitis, and so the term “rhinosinusitis” is often applied to these disorders. Despite the continuum that exists between rhinitis and sinusitis, they are discussed as separate entities in this textbook for teaching purposes. Inflammations that are confined chiefly to the nasal cavity are covered in the previous chapter. This unit deals with acute and chronic sinusitis in addition to nasal polyps, mucoceles, pyoceles, and rhinosinogenic complications—diseases in which clinical symptoms arising from the paranasal sinuses are the dominant features.

Acute Sinusitis

Etiopathogenesis: While acute sinusitis in children predominantly affects the ethmoid cells due to incomplete pneumatization of the other sinuses (see 1.1, p. 4), acute sinusitis in adults affects the following sinuses in descending order of frequency: maxillary sinus, ethmoid cells, frontal sinus, and sphenoid sinus. The inflammation may involve one, several, or all of the paranasal sinuses (pansinusitis).

Acute sinusitis generally results from the spread of an intranasal inflammation (rhinitis), since the mucosa of the paranasal sinuses communicates with that of the nasal cavity (rhinogenic sinusitis). Accordingly, the causative viruses of acute rhinitis (see p. 49) are etiologically important in addition to the common bacterial organisms *Haemophilus influenzae* and *Streptococcus pneumoniae*.

Although rhinitis has a very marked tendency to involve the contiguous sinus mucosae, acute rhinitis does not invariably lead to symptomatic sinusitis. The extent of the inflammation in the sinus system and the associated symptoms depend on various factors:

- Individual functional anatomy (see Chapter 1, p. 2)
- Individual immune status
- Specific virulence of the causative organism

Besides rhinogenic sinusitis, there are also rare instances of dentogenic sinusitis arising from a dental root infection, an apical granuloma, or a maxillary sinus fistula following a tooth extraction (3.14).

Symptoms: The clinical picture is marked by the features of acute rhinitis combined with a variable degree of headache, which is exacerbated by bending over. Generally the pain is most intense over the affected sinuses (see also Fig. 1.6, p. 6). Thus, the pain of maxillary sinusitis is greatest over the maxillary sinus and the adjacent midface and temple. Ethmoid sinusitis is most painful over the bridge of the nose and the medial canthus of the eye, and frontal sinusitis over the anterior wall and floor of the frontal sinus, with pain radiating toward the medial canthus. The pain of sphenoid sinusitis is fairly nonspecific, marked by a dull, aching pressure located at the center of the skull and radiating to the occiput.

Diagnosis: Rhinoscopy or nasal endoscopy often reveals pus tracking along the middle meatus of the nasal cavity (Fig. 3.36), but a purulent track may not be seen if the mucosa is greatly swollen. With isolated sphenoid sinusitis, pus may be found about the ostium in the anterior wall of the sphenoid sinus or on the posterior wall of the pharynx.

Sinus radiographs (see also Fig. 2.7, p. 22) may show partial opacification of the affected sinus due to mucosal swelling (Fig. 3.37a) or may demonstrate a fluid level if the sinus contains free pus (Fig. 3.38). An alternative to radiography, especially for follow-up and in children and pregnant women, is ultrasonography (A-mode or B-mode), which avoids radiation exposure.

Treatment: Conservative treatment options should be exhausted before surgery is considered. The latter may be necessary in cases where the complaints of acute sinusitis do not respond to conservative treatment modalities and in cases with persistent sinus empyema.

Conservative therapy: Ventilation and drainage of the paranasal sinuses can be improved by the use of decongestant nose drops, nasal spray, or by inserting a cotton pack soaked with nose drops into the middle meatus. In more severe forms associated with fever and significant malaise, *antibiotics* (e.g., amoxicillin) should be administered. *Heat therapy* (electric light bath) and the *inhalation* of chamomile or sage are recommended as adjuncts.
Surgical therapy: Maxillary sinusitis can be treated by maxillary sinus puncture following decongestion and topical anesthesia of the nasal mucosa. Two approaches are available: first, “sharp puncture” through the inferior meatus, passing the needle below the inferior turbinate; and second, “blunt puncture” via the natural maxillary sinus ostium in the middle meatus. In the sharp puncture technique, there is a significant risk of complications due to air embolism if air is inadvertently injected into the sinus after a medication has been instilled. Another potential danger is perforation of the lateral sinus wall, resulting in a buccal abscess or perforation of the sinus roof causing infection of the orbital contents (Fig. 3.39).

A frontal sinus empyema can be surgically drained through a “Beck puncture” (3.15). There should be little hesitation in using this procedure, since the frontal sinus directly borders the cranial cavity, posing a risk of meningoencephalitis or frontal brain abscess.