Chapter 123

Disorder of Ear, Nose, and Sinus

Hartmut Göbel and Robert W. Baloh

EARS

International Headache Society (IHS) code and diagnosis: 11.4 Headache attributed to disorder of ears
World Health Organization (WHO) code and diagnosis: G44.844 Headache associated with disorders or diseases of the ear and mastoid process
H60: Otitis externa
H61: Other disorders of external ear
H62*: Disorders of external ear in diseases classified elsewhere
H65: Nonsuppurative otitis media
H66: Suppurative and unspecified otitis media
H68: Eustachian salpingitis and obstruction
H69: Other disorders of eustachian tube
H70: Mastoiditis and related conditions
H71: Cholesteatoma of middle ear
H75*: Other disorders of middle ear and mastoid in diseases classified elsewhere
H92: Otalgia and effusion of ear
H92.0: Otalgia

EPIDEMIOLOGY

No systematic population-based studies of the epidemiology of the different forms of pain associated with diseases of the ears are known. Only studies of individual clinical cases exist. A Spanish study analyzed the epidemiology of acute otitis media in 20,532 schoolchildren over a 6-month period (8). The study was based on a questionnaire sent to all Spanish pediatricians. The most frequent symptom of otitis media, in 92.7% of cases, was earache. In 45.6% of cases, the symptoms occurred on both sides.

In general, earache is a frequent symptom, especially in children. An analysis of the most frequent symptoms in the emergency department of a university pediatric clinic showed that five symptoms were responsible for 40% of all consultations: high temperature, vomiting or diarrhea (or both), infection of the upper respiratory tract, earache, and skin rashes (30). An Austrian study investigated symptoms in children in connection with swimming in lakes open for public bathing. At 32.4%, otalgia was the most common symptom. The study also found a significant correlation with rhinitis, conjunctivitis, coughing, and sore throat (36.5%) (10). Otitis media is thus one of the most frequent causes of earache.

Earache, otorrhea, and otorrhea with bleeding are the principal symptoms of patients with tumors of the middle ear (17). A study that analyzed the symptoms of nasopharyngeal carcinomas revealed that deafness and earache, encountered in 85% of cases, were the most common symptoms besides swelling of the throat. The earache had been present for as long as 9 months before a correct diagnosis was made (31). The most common cause of intracranial abscesses, with a frequency of 73%, was chronic infection of the middle ear. The clinical symptoms are characterized by chronic otitis with otorrhea, earache, headache in the region of the temples, high temperature, nausea, and vomiting (6,19).

ANATOMY AND PATHOLOGY

Local structural lesions in the region of the pinna, external ear canal, tympanic membrane, and middle ear may give rise to primary otalgia. Only about 50% of all earaches are due to structural lesions of the external or middle ear. Disorders outside this region may lead to referred otalgia as a result of radiation of pain into the ear region. Sensory fibers of the fifth, seventh, ninth, and tenth cranial nerves project into the auricle, external auditory canal, tympanic membrane, and middle ear (Table 123-1). For this reason, referred pain from remote structural lesions in these anatomic regions can be felt as referred otalgia.

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GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

TABLE 123-1 Sources of Referred Otalgia

Nerve	*Location of Lesion*	*Common Disorders*
Fifth cranial nerve, mandibular division (auriculotemporal branch)	Teeth	Pulpitis, periapical dental abscess
	Oral cavity	Glossitis, osteitis, intraoral abscess, benign or malignant growth
	Sinus	Inflammation, benign or malignant growth
	Temporomandibular joint (TMJ)	Dental malocclusion, arthritic process
Seventh cranial nerve, (Nervus intermedius branch)	Middle ear	Ramsey-Hunt syndrome (herpes zoster oticus)
Ninth cranial nerve (Jacobson's nerve)	Nasopharynx, eustachian tube, palatine tonsils, tongue	Inflammation, benign or malignant growth
Tenth cranial nerve (Arnold's branch)	Hypopharynx, larynx, nasopharynx	Benign or malignant growth
Second and third cervical roots (greater auricular nerve and lesser occipital nerve)	Base of skull	Abscess, inflammation, and tumor; thyroid carcinoma; lesions of nasopharynx and oropharynx
Cranial neuralgia	See Chapter 126	

PATHOPHYSIOLOGY

Primary Otalgia

Pinna

Primary pinna pain in the first instance may be caused by injuries or traumas that may result in laceration, burns, frostbite, infections, or abscesses. In the case of persistent minor lesions, a biopsy should be performed, because these lesions may obscure a malignant new growth, especially a basal cell carcinoma, a squamous cell carcinoma, or small benign growths.

External Ear Canal

The external ear canal is a particularly common source of primary earache. External otitis arises from an acute inflammatory process after ear trauma, inadequate cleansing of the external ear canal, or lengthy contact with liquid in bacterially contaminated water, especially in bathing lakes or swimming pools (swimmer's ear). External otitis, however, may occur on the basis of a chronic middle ear infection or as a result of a malignant new growth in the external ear canal. Malignant external otitis may be observed, particularly in patients with diabetes mellitus or an immune deficiency. In addition to severe earache with reddening of the pinna and inflammation of the periauricular region, there is heightened sensitivity to touch, swelling of the pinna, and swelling of the mastoidale. A general feeling of malaise and elevated temperature also may occur.

Ear wax also may be responsible for earache and pressure in the ear. The same applies to foreign bodies in the ear canal. Removal of such objects must be undertaken with the utmost care and precision to avoid injuring the external ear canal and the tympanic membrane. Another cause of earache may be benign or malignant new growth in the external ear canal. In case of doubt, a biopsy should be performed. Neoplasms are rare and in most cases take the form of a squamous cell carcinoma or adenocarcinoma.

Middle Ear and Mastoid

An acute infection of the mucous membrane of the middle ear in the form of acute otitis media usually stems from an infection of the upper air passages with dysfunction of the eustachian tube. Rhinitis and adenoid inflammation also may cause acute otitis media. The disease usually is accompanied by an elevated temperature and infection of the upper respiratory tract. Examination reveals reddening and swelling of the tympanic membrane. Occasionally, a purulent discharge is present.

Acute mastoiditis may complicate otitis media if not treated properly. Typically, a highly sensitive and swollen mastoidale is present. Obstruction of the pinna, a reddened and bulging tympanic membrane, and purulent otorrhea are typical examination findings. An initial slight ache increases sharply with the purulent inflammation and radiates into the entire neck and head area.

Petrositis

Inflammatory spread to the petrous bone from otitis can occur and would be complicated by meningitis or an intracranial or extradural abscess. Pain can be referred to the temporoparietal, retro-orbital, and temporal regions. Lesions of the cranial nerves also may be observed. The

P1: KWW/KKL P2: KWW/HCN QC: KWW/FLX T1: KWW
GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

classic triad of findings associated with lesions of the petrous apex (Gradenigo syndrome) includes (1) deep retro-orbital pain, (2) paresis of the ipsilateral lateral rectus muscle, and (3) otorrhea.

Acoustic Neuroma

Acoustic neuroma (vestibular schwannoma) is a benign tumor of the neural sheath of the eighth cranial nerve and its peak incidence is mostly between the ages of 30 and 40. Women are affected more frequently than men. Tinnitus, hearing loss, and tingling or deep pain in the ear are early symptoms. Over time, these symptoms may be joined by vertigo. As the tumor slowly grows out of the internal auditory canal into the cerebellopontine angle it can compress the fifth and seventh cranial nerves, producing numbness and weakness of the face. Dysarthria, ataxia, and incoordination also may be observed due to compression of the adjacent cerebellum. Obstruction of cerebrospinal fluid circulation may give rise to headache from increased intracranial pressure with nausea, vomiting, and neuropsychologic deficits.

Traumas

Trauma of the tympanic membrane may be caused by direct mechanical damage with fracture of the temporal bone or by external compression. Foreign bodies also may give rise to traumatic perforation of the tympanic membrane. Rupture of the tympanic membrane also may occur as a result of increased pressure in the external ear canal, for example, as a result of a slap on the ear with an open hand. Earache and hearing loss occur as typical symptoms.

Barotrauma is caused by elevated pressure in the external ear canal, for example, by sudden changes of pressure in an airplane or during diving activities. Symptoms include localized or radiating pain in the region of the middle ear but also along the fifth, ninth, and tenth cranial nerves. Hematotympanum and conduction deafness also may occur.

Trauma of the temporal bone most commonly leads to a longitudinal fracture, which may result in rupture of the tympanic membrane. Depending on its course, the fracture may lead to paralysis of the seventh cranial nerve. Pain radiates into the area of distribution of the fifth, ninth, and tenth cranial nerves. In addition, conduction deafness or facial paralysis may be observed. Given appropriate localization, drainage of cerebrospinal fluid or blood from the external ear canal also may occur. An ecchymosis over the mastoid (Battle sign) is an indication of a fracture of the base of the skull.

In a transverse fracture, there may be no rupture of the tympanic membrane, depending on the course of the fracture line. If the internal auditory canal is involved, lesions of the seventh and eighth cranial nerves may occur with sensory–neural hearing loss, vertigo, and facial paralysis.

Benign and Malignant New Growth in the Middle Ear

A growth in the middle ear is rare but always should be considered if a chronic middle ear infection or a polypoid lesion does not respond to adequate treatment and chronic pain continues. The pain is typically localized, but it may radiate into the areas of distribution of the fifth, ninth, and tenth cranial nerves. Examination reveals local ulceration, which should be subjected to biopsy.

Secondary or Referred Otalgia

Referred otalgia may arise from structural lesions in the region of the branches of the fifth, seventh, ninth, and tenth cranial nerves and of the second and third cervical roots (Table 123-1).

CLINICAL FEATURES

IHS diagnostic criteria for headache attributed to disorder of ears (Revised International Classification for Headache Disorders [ICHD-II]) (14) are as follows:

A. Headache accompanied by otalgia and fulfilling criteria C and D.
B. Structural lesion of the ear diagnosed by appropriate investigations.
C. Headache and otalgia develop in close temporal relation to the structural lesion.
D. Headache and otalgia resolve simultaneously with remission or successful treatment of the structural lesion.

There is no evidence that any pathology of the ear can cause *headache* without concomitant otalgia. Structural lesions of the pinna, external auditory canal, tympanic membrane, or middle ear may give rise to *primary otalgia* associated with headache. Headache attributed to disorders of the ear is experienced as ear fullness, throbbing, pressure and tenderness, phonophobia, burning, or itching. The pain can radiate to vertex and temples and can involve half of the head or even the global head. Pain intensity may vary from mild to quite severe. The character is described as dull, aching, or lancinating. Associated symptoms may be tinnitus, hearing loss, or vertigo. Pathologic changes are often visible by examination, and manipulation may increase the pain intensity. Retroauricular or subauricular lymphadenitis is a common accompaniment that can increase pain and pressure.

MANAGEMENT

Treatment of referred otalgia must be targeted specifically at the relevant local causes (Table 123-1). Treatments for the various causes of primary otalgia must focus on the specific lesion (Table 123-2).

P1: KWW/KKL P2: KWW/HCN QC: KWW/FLX T1: KWW
GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

TABLE 123-2 Sources of Primary Otalgia

Source of Primary Otalgia	*Lesion*
Pinna	Abscess and infection
	Frostbite
	Burns
	Laceration
External ear canal	External otitis
	Furunculosis
	Malignant external otitis
	Ceruminosis
	Foreign bodies
	Malignant (squamous cell carcinoma, adenocarcinoma) or benign growths
Mastoid and middle ear	Acute otitis media
	Chronic serous otitis media
	Acute mastoiditis
Tympanic membrane	Perforation
	Barotrauma
Internal auditory cana	Acoustic neuroma
	Fractures

NOSE

IHS code and diagnosis: 11.5 Headache attributed to rhinosinusitis

WHO code and diagnosis: G44.845 Headache associated with disorders or diseases of the respiratory system: other disorders of nose and nasal sinuses (J34)

Short description: Headache attributed to acute or acute-on-chronic rhinosinusitis. Other conditions that may cause headache are nasal passage abnormality due to septal deflection (J34.2), hypertrophic turbinates (J34.3), atrophic sinus membrane (J34.8), and mucosal contact. These conditions are not sufficiently validated as being causes of headache.

EPIDEMIOLOGY

One study of approximately 4000 consecutive newborn infants indicated that the incidence of anterior nasal septal cartilaginous dislocation was 0.93% over a 2-year period (25). In another study, 100 consecutive computed tomography (CT) scans for evaluation of diseases of the nasal sinuses were compared with 82 consecutive scans obtained for evaluation of diseases of the orbital cavity with regard to the frequency of concha pollosa, paradoxical middle turbinate, and septal deviation (5). Abnormal findings of the osteomeatal complex were significantly more frequent in patients with diseases of the nose and nasal sinuses. Concha pollosa and septum deviation, but not paradoxical turbinates, were clearly linked to disorders of the nasal sinuses (5).

Headache and nasal and respiratory symptoms can be a manifestation of environmental exposure to fumes. Indeed, a case-controlled study from Finland indicated that irritation of the eyes, respiratory symptoms, and headache were more than twice as common in children exposed to malodorous sulfur fumes from pulp mills than in the control groups (21).

Similarly, the prevalence of the sick-building syndrome, characterized by a pattern of nasal, ocular, and mucous membrane symptoms with lethargy, dry skin, and headache, was significantly increased in offices that were fully air-conditioned as compared to naturally ventilated buildings (11).

Numerous studies have shown a marked increase in the prevalence of allergic rhinitis over the last 30 years, mostly in children and young adults. It is estimated that allergic rhinitis occurs in approximately 20% of people (of all ages) worldwide, although the frequency can vary significantly (20 to 60 times) from one country to another (15). If there is a family history of rhinitis, the risk compared with those without such a prior history is two to six times greater (20).

ANATOMY AND PATHOLOGY

Pain sensations from the nasal region are mediated by the first and second branch of the trigeminal nerve (Fig. 123-1). Autonomic innervation of the nasal cavity takes place through the sphenopalatine ganglion with parasympathetic branches of the facial nerve, which take the same course as the greater superficial petrosal nerve. The parasympathetic fibers innervate the glands and blood vessels of the nose. The sympathetic fibers follow the course of the deep petrosal nerve and the seventh cranial nerve.

PATHOPHYSIOLOGY AND CLINICAL FEATURES

Nasal Septum

Deviation of the nasal septum may cause symptoms of nasal obstruction, particularly if the deviation is in the region of the nasal valve. An obstruction of the nasal air passages may result in an acute disease of the nasal sinuses that causes facial pain (22). As a result of the nasal obstruction, the mucous membrane exerts pressure on the lateral wall of the nasal cavity. Inadequate constriction of the nasal mucous membrane results in squeezing of the nasal septum, which may lead to facial pain. Also, acute or chronic sinusitis can complicate the picture.

Septal Hematoma and Septal Abscess

Hematoma of the nasal septum or an abscess of the nasal septum presents with a purulent and swollen nasal septum.

P1: KWW/KKL P2: KWW/HCN QC: KWW/FLX T1: KWW
GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

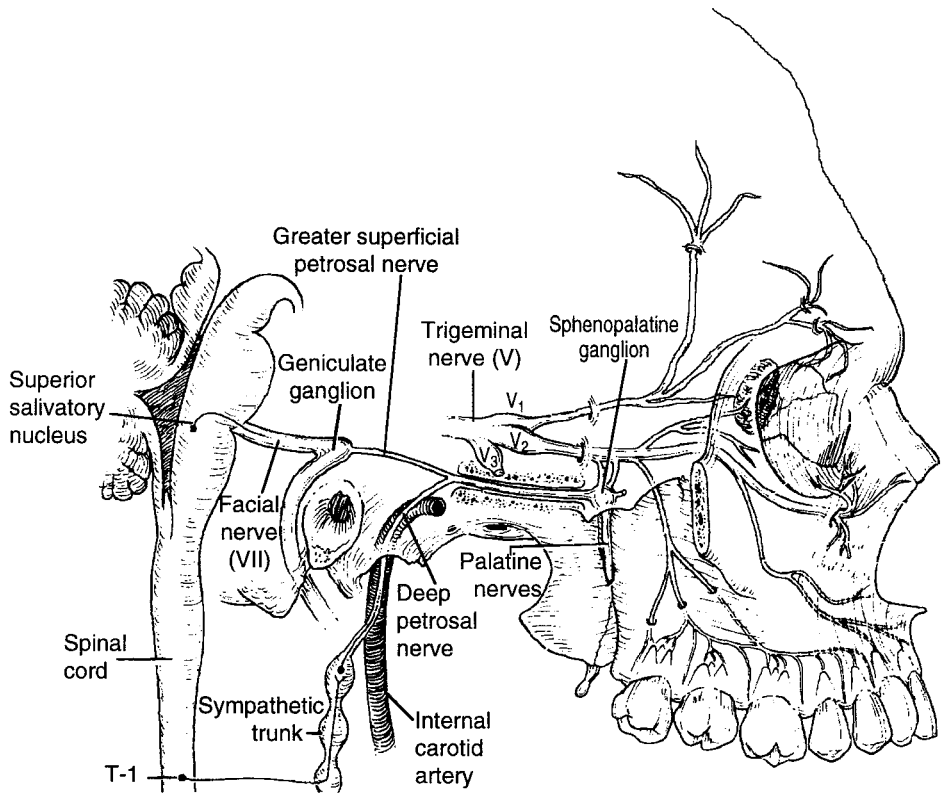

FIGURE 123-1. Innervation of the nasal and paranasal regions.

The associated pain is localized and severe with marked sensitivity to local pressure and reddening of the tip of the nose. In particular, an abscess of the nasal septum may be present in cases of granulomatous disease and polychondritis or other autoimmune disorders.

Inflammatory Rhinosinusitis

The disease is accompanied by rhinorrhea, elevated temperature, pain affecting the middle part of the face and the area of distribution of the first and second trigeminal branches, and symptoms of an infection of the upper respiratory tract. The nasal mucous membrane is reddened and swollen and may display a purulent discharge. A nasal swab shows large quantities of neutrophils, in contrast with allergic rhinitis where eosinophils are predominant.

Allergic Rhinitis

As a rule, allergic rhinitis does not cause primary pain, but it may give rise to acute sinusitis, with facial pain as a secondary development. Allergic rhinitis is typically seasonal. Symptoms include nasal obstruction, nasal pain, and rhinorrhea. By contrast with inflammatory rhinitis, the nasal mucous membrane exhibits a bluish discoloration in allergic rhinitis.

Vasomotor Rhinitis

Vasomotor rhinitis is characterized by excessive reactivity of the mucous membrane, which may be due to a wide variety of factors. The nasal discharge is clear, and the nasal mucous membrane is swollen and displays a slight reddening compared with inflammatory rhinitis. Environmental factors, hormones, stress, emotions, and medications are believed to contribute to the symptoms of vasomotor rhinitis.

Atrophic Rhinitis

Atrophic rhinitis is characterized by reduced reactivity of the nasal mucous membrane. Mucous production is reduced, and the nasal mucous membrane is dry, encrusted, inflamed, and irritated.

MANAGEMENT

Acute inflammatory rhinitis is treated with detumescent nose drops, moist inhalations, and antibiotics. Treatment of allergic rhinitis primarily involves identifying the responsible allergens through a careful history and skin tests and avoidance of, or desensitization from, the allergens. Antihistamines can be used for seasonal episodes. A topically applied nasal steroid also may alleviate allergic

P1: KWW/KKL P2: KWW/HCN QC: KWW/FLX T1: KWW
GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

rhinitis. In the treatment of vasomotor rhinitis, the first priority is to eliminate the causal factors whenever possible. Occasionally, operative intervention may be necessary. Atrophic rhinitis is treated by topical application of nasal steroids and moistening of the nasal mucous membrane by nasal sprays or inhalations. Application of vasoconstrictive nasal sprays over long periods should be avoided, because patients develop medication-induced rhinitis with rebound phenomena.

Deflection of the nasal septum plays a minor role as a possible cause of headache and should therefore be regarded as an operation indication in exceptional cases only (27). Indeed, a clinical study of 392 patients with nasal septum deviation who underwent operative correction because of headache (31%) or impeded breathing showed complete remission of symptoms in only 10.6% of the respondents; 7.9% displayed no improvement; and postoperative complications such as adhesions, perforations, and such conditions occurred in 29.9% (2).

NASAL SINUSES

IHS code and diagnosis: 11.5. Headache attributed to rhinosinusitis
WHO code and diagnosis: G44.845 Headache associated with disorders or diseases of the respiratory system:
Acute sinusitis headache (J01)
Acute maxillary sinusitis (J01.0)
Acute frontal sinusitis (J01.1)
Acute ethmoidal sinusitis (J01.2)
Acute sphenoidal sinusitis (J01.3)
Acute pansinusitis (J01.4)
Other acute sinusitis (J01.5)
Acute sinusitis unspecified (J01.9)
Chronic sinusitis (J32)

EPIDEMIOLOGY

The prevalence of sinusitis was 45% in children who underwent magnetic resonance imaging (MRI) for neurologic reasons but had no clinical symptoms of sinusitis (12). In another study, the prevalence of abnormal findings in the region of the nasal sinus in adults who underwent MRI testing for neurologic disorders was 49.2%, although without any clinical relevance (7). The most common abnormality was swelling of the mucous membrane of the nasal sinuses. The ethmoidal cells exhibited the most abnormalities (7). Both studies indicate that inflammatory changes of the nasal sinus can be clinically asymptomatic. Furthermore, reversible radiologic signs of sinusitis are common with any viral upper respiratory tract infection (13). Inflammatory changes in the region of the nasal sinuses, like headaches, are extremely frequent. Thus, causality between headache and inflammatory changes cannot be established with certainty (24).

PATHOPHYSIOLOGY

Acute Sinusitis

Symptoms of acute sinusitis are due to inflammation of the nasal membrane, nasal sinuses, and their vicinity. Patients' complaints focus mainly on the mostly affected nasal sinus. A purulent discharge and headache develop with acute nasal sinusitis, which typically occurs after an infection of the upper respiratory tract with rhinitis and swelling of the nasal mucous membrane. The result is obstruction of the orifices of the nasal sinuses with blockade of normal drainage and ventilation. Also, inflammation of the mucous membrane disturbs the nasal ciliary action, resulting in a reduction in drainage. An obstructive lesion in the region of the nasal cavity or the middle meatus by nasal polyps similarly alters normal drainage. The same applies to an obstruction of the middle meatus by nasal polyps. Maxillary sinusitis also may be caused by inflammations of dental origin, such as periapical abscesses, or of iatrogenic origin as a result of dental surgery. Allergies, hypothyroidism, cystic fibrosis, immune suppression, and diabetes mellitus predispose to the development of sinusitis. The same applies to immune suppression and the existence of diabetes mellitus. Inflammation of the nose with swelling and blockade of sinus drainage may be due to nasotracheal intubation or nasogastric tube feeding. Trauma to the nasal sinus with fractures also may give rise to nasal sinusitis. Finally, hypertrophy of the adenoids or tonsils may induce nasal sinusitis as a result of reduced ventilation.

Chronic Sinusitis

Chronic sinusitis is characterized by chronic inflammation of the nasal sinus mucous membranes, which become hypertrophic and cause a permanent disturbance of nasal ciliary action and altered function of the mucous glands. Symptoms of chronic nasal sinusitis or hypertrophic nasal concha are not a validated cause of headache since nearly 50% of the population exhibit chronic inflammation of the nasal sinus mucous membranes without headaches (20).

A transillumination examination can reveal pus levels in sinusitis. Plain radiographs of the nasal sinuses may show shadows or fluid levels. It is not possible to differentiate chronic from acute sinusitis by means of radiologic examination; this must be done on the basis of clinical features and the examination findings. A CT or magnetic resonance tomogram may be helpful in differentiating between a cystic and a solid lesion or a fluid level (Fig. 123-2).

P1: KWW/KKL P2: KWW/HCN QC: KWW/FLX T1: KWW
GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

FIGURE 123-2. Computed tomography showing chronic sinusitis involving maxillary (*large arrows*) and ethmoid (*small arrows*) sinuses. The patient was asymptomatic.

CLINICAL FEATURES

IHS diagnostic criteria for headache attributed to rhinosinusitis (International Headache Classification Committee, 2004) are as follows:

A. Frontal headache accompanied by pain in one or more regions of the face, ears, or teeth and fulfilling criteria C and D.
B. Clinical, nasal endoscopic, CT and/or MRI imaging and/or laboratory evidence of acute or acute-on-chronic rhinosinusitis (see Notes, #1 and #2)
C. Headache and facial pain develop simultaneously with onset or acute exacerbation of rhinosinusitis.
D. Headache and/or facial pain resolve within 7 days after remission or successful treatment of acute or acute-on-chronic rhinosinusitis.

Notes:
1. Clinical evidence may include purulence in the nasal cavity, nasal obstruction, hyposmia/anosmia, and/or fever.
2. *Chronic sinusitis* is not validated as a cause of headache or facial pain unless relapsing into an acute stage.

Migraine and tension-type headache are often confused with IHS 11.5 Headache attributed to rhinosinusitis because of similarity in location of the headache. A group of patients can be identified who have all of the features of IHS 1.1 Migraine without aura and, additionally, concomitant clinical features such as facial pain, nasal congestion, and headache triggered by weather changes. None of these patients has purulent nasal discharge or other diagnostic features of acute rhinosinusitis. Therefore, it is necessary to differentiate IHS 11.5 Headache attributed to rhinosinusitis from so-called "sinus headaches," a commonly made but nonspecific diagnosis. Most such cases fulfill the criteria for Migraine without aura, with headache either accompanied by prominent autonomic symptoms in the nose or triggered by nasal changes. Over 90% of self-diagnosed and doctor-diagnosed "sinus headaches" meet the criteria for migraine, and migraine misdiagnosed as "sinus headache" responds to triptans (4,29,30).

Headache of acute nasal sinusitis is dull, oppressive, and located in the region of the inflamed nasal sinus. There is no nausea or vomiting. Owing to the changed fluid level in the nasal sinus, the intensity of the pain often increases with head movement.

Maxillary Sinusitis

The pain of maxillary sinusitis is felt mostly over the affected sinus, but it may radiate into the neighboring ear or the teeth. Also, the affected nasal sinus and neighboring teeth are sensitive to palpation or percussion. There is a mucous or purulent discharge from the middle meatus and the sense of smell is impaired.

Chronic maxillary sinusitis manifests as nonspecific symptoms with rhinorrhea, but typically, facial pain and headache do not occur.

Frontal Sinusitis

The headache of acute frontal sinusitis typically is behind the eyes and around the center of the forehead. Patients report strong local pressure. The pain is strongest on waking in the morning and is eased by getting up. The frontal sinus region is sensitive to percussion, and the supraorbital nerve is highly sensitive to pain. A purulent discharge comes from the nasofrontal duct. In the event of complete obstruction, the purulent discharge may not be observed.

In chronic inflammation of the frontal sinus, there may be slight pain above the affected nasal sinus. The nasofrontal duct may be obstructed by a mucocele (18).

Ethmoidal Sinusitis

In acute ethmoidal sinusitis, the pain is retro-orbital, radiating to the temples. The eyes are sensitive to pressure, and there is bilateral blockage of the nose. The eye examination is normal. Nasopharyngeal examination reveals purulent drainage at the rear pharyngeal wall. If the orbits are involved, there may be swelling of the eyelids with chemosis. An orbital abscess may develop with time.

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GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

Sphenoidal Sinusitis

The headache of acute sphenoidal sinusitis is in the orbital region and the vertex region, with radiation into the forehead, ear, and mastoid. There is a purulent discharge from the sphenoid orifice.

MANAGEMENT

Acute nasal sinusitis is treated with antibiotics and oral decongestants. Detumescent nasal drops are used for a maximum of 3 days to improve drainage in the region of the nasal concha and the orifices of the nasal sinuses. Local steroids are used as well. Infrared treatment and hot compresses in the region of the nasal sinus may reduce the pain, as may analgesics. Moist inhalations or hot aerosol vapors should be inhaled to improve mucous drainage.

The pathogenic bacteria can be eliminated by irrigating the nasal sinuses with saline solution and by antibiotic therapy. In patients with continual recurrences of sinusitis, it may be necessary to apply topical corticoid therapy over a lengthy period. Surgery is reserved for patients who fail medical therapy and aims to achieve an improvement in sinus drainage by enlarging the orifices and by removing obstructive anatomic structures (1,16). Rhinitis can be treated with topical corticosteroids, mastoid cell stabilizers, or antihistamines, either as monotherapy or in combination. Nasal secretion can be improved by steam inhalation or by irrigating the nose with saline solution. If conservative measures do not prove sufficiently effective, operative therapy may be necessary. Removal of nasal polyps, reduction of the lower nasal concha, or correction of septal deviation may be necessary. In some cases, endoscopic ethmoidectomy and middle meatal antrostomy are necessary. Complications that may arise from acute or chronic sinusitis are intraorbital or intracranial infections. Such diseases require urgent imaging diagnosis using CT, intravenous administration of broad-spectrum antibiotics, and, if necessary, operative drainage (9).

Because of the high complication rate, the Caldwell-Luc procedure, formerly used for treating maxillary sinusitis, should no longer be used. The preferred method for operative treatment today is endoscopy (23,26).

MUCOSAL CONTACT POINT HEADACHE

IHS code and diagnosis: A11.5.1 Mucosal contact point headache
WHO code and diagnosis:
J34.3 Hypertrophy of nasal turbinates
J34.8 Other specified disorders of nose and nasal sinuses

CLINICAL FEATURES

An association between nasal septal mucosal contact points and facial pain has often been quoted, but may be coincidental. To date, there is limited evidence to support an association, and controlled trials are necessary to validate or disprove a link between mucosal contact points and headache.

IHS diagnostic criteria for mucosal contact point headache (International Headache Classification Committee, 2004) are as follows:

A. Intermittent pain localized to the periorbital and medial canthal or temporozygomatic regions and fulfilling criteria C and D.
B. Clinical, nasal endoscopic, and/or CT imaging evidence of mucosal contact points without acute rhinosinusitis.
C. Evidence that the pain can be attributed to mucosal contact based on at least one of the following:
  1. Pain corresponds to gravitational variations in mucosal congestion as the patient moves between upright and recumbent postures.
  2. Abolition of pain within 5 minutes after diagnostic topical application of local anesthesia to the middle turbinate using placebo or other controls (see Notes)
D. Pain resolves within 7 days, and does not recur, after surgical removal of mucosal contact points.

Note:
1. Abolition of pain means complete relief of pain, indicated by a score of zero on a visual analog scale (VAS).

In a recent study CT scans of 100 consecutive rhinology patients were examined for contact points, and the sinuses were scored according to a standardized system (3). The patients' nasal symptoms were recorded using validated questions. Contact of the nasal septum with the lateral nasal structures was identified in 55 patients. The presence of contact was significantly associated with nasal blockage and reduction of smell, but there was no correlation with facial or head pain. Whereas the results of the study support the hypothesis that nasal contact may impede ventilation and drainage of the paranasal sinuses, the study detects no evidence to support the concept that contact points cause facial pain or headaches.

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P1: KWW/KKL P2: KWW/HCN QC: KWW/FLX T1: KWW
GRBT050-123 Olesen- 2057G GRBT050-Olesen-v6.cls August 17, 2005 2:2

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