Otology seminar
Otalgia

R3 王守仁 93-03-17

I. otalgia: pain localizing to the ear
   1. primary otalgia: pain with an etiology in the ear.
   2. referred otalgia: does not have a distinct otologic etiology
      also termed secondary, or nonotogenic, otalgia.

II. Anatomic consideration (Fig.1)
   1. pinna: CN V, VII, IX, X, greater (C3) and lesser auricular nerves
   2. middle ear: Jacobson’s nerve(tympanic plexus), CN VII, X.
   3. inner ear: vestibulocochlear nerve (not carry pain fibers), but ..

III. Differential diagnosis (Box 1)

primary otalgia

1. otitis media: CN IX, V, etc; dural nociceptive afferents (V, X)
2. otitis externa: suspect malignancy in refractory otitis externa
3. chronic myringitis: loss of tympanic membrane epithelium for
   longer than 1 month in the absence of disease in the tympanic cavity
4. bullous myringitis and bullous external otitis: the pressure of the
   bullae on the skin overlying the external auditory canal
5. Eustachian tube dysfunction: distortion of the mucosa of the middle
   ear and of the tympanic membrane
6. viral cranial neuropathy: a primary sensation from the vesicles or an
   irritation or inflammation of the affected cranial nerves; postherpetic
   neuralgia (Ramsay Hunt syndrome: a polycranial neuropathy)
7. relapsing polychondritis: auricular cartilage (chondritis)
8. otologic neoplasms
9. trauma, environmental insults, skin disease, mastoid process(SCM)

referred otalgia: due to complex innervation of the ear

1. temporomandibular joint disorders
2. Eagle’s syndrome: defined as otalgia, facial pain, sore throat, globus,
   or dysphagia secondary to elongation of the styloid process or
   ossification of the stylohyoid ligament.
3. gastroesophageal reflux (GERD)
4. head and neck tumors, intracranial lesions
5. cranial neuralgia
IV: Cranial neuralgia-associated otalgia

1. Trigeminal neuralgia (tic douloureux)
   (1) usually occurs in middle and late age
   (2) paroxysms of pain in the distribution of the second and third divisions of the trigeminal nerve, either alone or in combination
   (3) lancinating, shooting, or electric shocklike; seconds to minutes
   (4) initiated/triggered by stimulation within any area of the affected n.
   (5) classified as being primary (idiopathic) or secondary to lesions of the gasserian ganglion sensory root or root entry zone (REZ) in the pons
   (6) Imaging studies (MR or CT scans with and without contrast) are also usually normal; high-resolution MRI: vascular compression of the trigeminal nerve in 59% of patients in Brisman, 2002.
   (7) pharmacologic therapy: Carbamazepine (CMZ) 600 to 1200 mg/d
   (8) invasive procedures: posterior fossa microvascular decompression (SCA) (70%) or stereotactic radiosurgery (70% pain relief, 80Gy)

2. Glossopharyngeal neuralgia
   (1) the pain is paroxysmal, has a lancinating/sharp quality, and is localized to the throat, posterior third of the tongue, tonsillar region, nasopharynx, larynx, and ear
   (2) triggered most commonly by swallowing but also by chewing, laughing, yawning, and talking
   (3) no demonstrable abnormalities on clinical examination in patients
   (4) MRI or CT scanning with contrast to exclude neoplasms of the oropharynx and skull base; no specific etiology in most cases
   (5) Treatment should include trials of carbamazepine, phenytoin, gabapentin, clonazepam, or baclofen individually or in combination
   (6) Surgery: section of CN IX and and the upper rootlets of the CN X; Microvascular decompression of the REZ of the CN IX (PICA)

3. Nervus intermedius neuralgia of Hunt (geniculate neuralgia)
   (1) affect patients of middle age, involves the pinna and EAC
   (2) in most cases no clear etiology is known; following herpes zoster
   (3) abnormalities of lacrimation, salivation, and taste can be associated
   (4) the pain is trigger by light touch within the posterior aspect of EAC
   (5) imaging studies with MR or CT scans with contrast should be performed to exclude any contributing structural lesions
   (6) some patients with this disorder respond to treatment with CMZ
   (7) Lovely, 1997, report favorable pain relief with excision of the nervus intermedius and geniculate ganglion
V: Evaluation and management of otalgia (Fig. 2)

1. begins with a detailed history and a thorough head and neck exam.
2. pertinent questions to elucidate during the history-taking process is the character and timing of the otalgia, exacerbating and alleviating factors of the otalgia, the patients past otologic history, the associated symptoms with the otalgia (tinnitus, hearing loss, vertigo), the presence of constitutional symptoms (to detect malignancies), and sinus and dental questions (look for sources of referred otalgia)
3. the cranial nerves are examined and compared bilaterally
4. in assessing otalgia in the setting of a normal otologic examination, a fiberoptic nasopharyngolaryngoscopy is mandated to look for lesions that can be potentially noxious to the CN V, VII, IX, or X; attention should be directed to the endolarynx to examine the mucosa for signs of gastroesophageal reflux
5. Imaging study: CT or MRI

References

Box 1. Common etiologies of otalgia discussed in this article

Primary otalgia
Neoplastic process
Infectious
Otitis media
Mastoiditis
Subperiosteal abscess
Petrous apicitis
Eustachian tube disease
Malignant otitis externa
Herpes zoster oticus (Ramsay-Hunt syndrome)
Bell’s palsy
Cultivated/seleroid/seleroid/seleroid/seleroid
Inflammatory
Otitis externa
Bulbous external otitis/bulbous myringitis
Raspearing polyseritis
Chondrodermatitis nodularis chronica helicis
Muscle spasm (internodular/masticating)
Environmental
Trauma (direct, blunt, penetrating, auricular hematoma)
Frostbite
Burns
Chronic myringitis
Squamous membrane perforation
Burschian tube dysfunction
Mumps
Secondary (referred) otalgia
Neoplastic process
Temporomandibular Joint Syndrome / Dental pathology
Epinephrine syndrome
Gastroesophageal reflux disease
Neuritis
Trigeminal
Ganglion
Sphenopalatine
Glossopharyngeal

Sensory innervation of the auricle. C3 via greater auricular nerve; C2 via lesser occipital nerve; X, auricular branch; V1, auriculotemporal nerve; V2, sensory trigem.

Fig. 2. Sensory innervation of the pinna, external auditory canal, and tympanic membrane. The evaluation of a patient with otalgia can be facilitated by dividing the possible etiologies into two groups based on expected findings. The dashed line shows common diagnosis paths that can be made on the basis of history alone, even in the absence of confirmatory clinical signs. Diagnoses marked with an asterisk (*) indicate those in which imaging studies usually play a valuable role.