Diseases of the auricle

Preauricular pits. Preauricular pits commonly occur at the root of the helix, although they may occur in other locations. They can descend down to the lower border of the tragus and can contain glandular structures.

1. Signs and symptoms. Purulent drainage with swelling and pain can occur when the pits become infected.

2. Management. When these tracts become repeatedly infected, surgical excision is necessary.

Auricular atresia (aplasia). Auricular atresia may be unilateral or bilateral, and can range from mild malformations to complete absence of the auricle. It is frequently associated with anomalies of the external canal, middle ear, and temporal bone. Hearing loss is frequent. Atresia can be inherited, associated with embryopathies (rubella, thalidomide), or chromosomal abnormalities. For this reason, careful evaluation for other anomalies is mandatory, particularly in regard to derivatives of the first and second branchial arch.

Hematoma auris: usually occurs with trauma to the auricle that produces hemorrhage under the perichondrium or skin.

a. Signs and symptoms. The hematoma or seroma is often blue, round, and smooth. Pain may be present. Because it disrupts the blood supply to the cartilage, prompt treatment is required to prevent aseptic necrosis and deformity (cauliflower ear).

b. Management. If hematomas or seromas are seen early in their course, before clot formation has occurred, aspiration with an 18-gauge needle and application of a pressure dressing may be sufficient. Careful follow-up is necessary to assess reaccumulation of the fluid. If the fluid reaccumulates or if aspiration is unsuccessful, incision and drainage, with the placement of drains, is indicated and should be performed in the operating room. Particularly resistant cases may require the placement of through-and-through mattress sutures over a bolus of cotton to ensure a good result. Fluid removal from the area should be Gram stained, cultured, and appropriate antibiotics begun. If there is evidence of infection (eg, purulent aspirate or cellulitis), intravenous antibiotic coverage should be started immediately to cover *Staphylococcus* and *Streptococcus* until culture results are obtained.

Auricular perichondritis

Causes: Poorly controlled Otitis Externa, Abrasions or Lacerations, High Ear Piercing (involving pinna cartilage), Usually within first month of piercing.

Organisms: *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococcus Pyogenes*,

Symptoms and Signs: Swollen warm, tender, erythematous auricle, Pain on deflection of auricle, Differentiates from superficial infection, Ear lobule may also be infected, Tympanic Membrane not involved
Management: Broad antibiotic coverage, Gram Positive Bacteria and Gram Negative Bacteria, Fluoroquinolones cover this well, Intravenous antibiotics may be needed, Local antibiotic drops if canal is affected, Surgical debridement may be needed,

Complications: Perichondrial abscess with poor cosmetic healing, Necrosis leading to (cauliflower ear).

Frostbite: occurs frequently to the auricle due to its protrusion and relatively poor blood supply.

a. Signs and symptoms. The auricle becomes white, with a slightly shiny appearance. There is loss of sensation to the affected area. Bullae may be present.

b. Management. Gradual rewarming is advisable using tepid compresses. Thereafter, the ear is treated like a burn. Antibiotic cream is applied to breaks in the skin, and a light sterile dressing is placed over the ear. Pressure is to be avoided. No debridement should be performed until viability is determined.

Tumors. Both basal cell and squamous cell carcinomas often involve the pinna since it is exposed to sunlight. Biopsy is necessary to determine the proper treatment. Squamous cell tumors may involve local nodes (mastoid, high cervical, parotid). Nodal disease must be resected in block or irradiated.

Diseases of the external canal

A. Cerumen impaction. Cerumen is a normal finding in ear canals. It acts as a protection from maceration and lubricates the skin. Normally, cerumen migrates laterally and is discharged from the canals. In certain patients, however, this mechanism is less efficient. This problem can be aggravated by the use of cotton-tipped applicators, which tend to pack the wax into the canal.

1. Signs and symptoms consist of hearing loss, pressure sensation, or otalgia.  2. Diagnosis is made by the appearance of the wax, which varies form almost white to dark black-brown.

3. Management consists of removal with instrumentation (eg, curette, suction) or by irrigation. Removal can often be facilitated by the use of softening drops (sodium bicarbonate, glycerol peroxide, liquid diocetyl sodium (Colacel)). Good illumination and exposure are necessary for this procedure. Irrigation should be avoided in patients who give a history of infection, bleeding, or perforated tympanic membrane.

B. Trauma. Most trauma to the external canal is caused by instrumentation of the ear canal, either by the patient or by the physician. Cotton-tipped applicators are a common offender.

1. Signs and symptoms. The appearance of a laceration or hematoma in the skin of the canal makes the diagnosis.
2. **Treatment** consists of antibiotic drops and water precautions in simple lacerations and hematomas. More complex lacerations, particularly circumferential lacerations, should be treated by packing the external canal with a Merocel wick and using antibiotic ear drops to prevent canal stenosis.

**C. Foreign bodies** are extremely common in younger children, but may be seen in any age group. The foreign body may consist of anything that is small enough to enter the canal.

1. **Signs and symptoms.** The history, particularly in young children, is often not helpful in establishing the diagnosis. Symptoms consist of hearing loss, pain, or drainage.

2. **Management.** In an adult or cooperative patient, gentle removal with a foreign body curette, suction, or forceps (alligator-type) is often possible. In less cooperative patients and in those patients in whom the foreign body is wedged into the canal, operative removal under anesthesia with magnification is indicated.

Vegetable foreign bodies (eg, dried beans) swell after insertion and often require operative intervention. Extreme caution and gentleness must be exercised in foreign body removal. Imprudent attempts at removal have resulted in severe lacerations of the canal, tympanic membrane perforations, ossicular disruptions, and facial nerve injury. Proper equipment and expertise are essential.

**D. Furuncle.** Single or multiple furuncles are common in the external portion of the ear canal.

1. **Signs and symptoms.** Furuncles appear as localized swellings that may be fluctuant. Tenderness to palpation or insertion of an ear speculum is often marked.

2. **Management** consists of drainage of fluctuant areas, heat, and the use of a topical antibiotic (eg, Bacitracin). Systemic antibiotics are necessary only with cellulitis or systemic symptoms (eg, fever) and should consist of antistaphylococcal drugs. Narcotics may be necessary for 24-48 hours for pain control.

**E. External otitis (diffuse)** also known as "swimmers' ear." This condition is very common, particularly during the summer months. Water maceration or trauma (or both) are often etiologic.

1. **Signs and symptoms** consist of itching, pain (often severe), a plugged sensation in the ear, and a discharge, which is often cheesy.

2. **Diagnosis.** Physical examination elicits pain on auricular movement or tragal pressure. The canal is diffusely swollen and tender and may be completely closed. Desquamated debris is usually present in the canal. The tympanic membrane may be obscured by debris or swelling. Cultures usually grow *Pseudomonas*, *Proteus* or, less frequently, *Staphylococcus* and *Streptococcus*. 
3. **Management** consists of gentle cleaning of the canal and topical antibiotic drops containing a steroid such as polymyxin B-neomycin-hydrocortisone (Cortisporin Otic Suspension) to reduce swelling. With marked swelling of the canal, a Merocel wick should be inserted to allow the drops to be delivered to the entire length of the canal. A wick of sufficient length should be inserted so that the patient may remove it in 48 hours. Drops are placed on the wick 4 times/day, and thereafter in the canal for a total of 7-10 days. Systemic antibiotics are necessary only for cellulitis extending outside the canal, in diabetics or immunosuppressed patients.

F. **Necrotizing external otitis** (sometimes confusingly referred to as malignant external otitis). This condition is an external otitis that has spread outside the confines of the external canal to involve bone, mastoid cells, and periaural soft tissue. It is usually diagnosed in diabetics or those immunosuppressed (including a few reported cases in newborns). Early reports cited a 50-80% mortality, but this rate has been improved with adequate and prompt therapy. Marked reduction in the incidence of necrotizing otitis externa can be achieved with prompt initiation of oral antipseudomonal drug therapy (ciprofloxacin) in those patients at risk for the disease with symptoms of early otitis externa.

1. **Signs and symptoms.** Pain is usually more severe than with simple external otitis and is often described as "deep" or "boring". The disease process usually begins with an external otitis, but tends to progress on standard medication.

2. **Diagnosis**

   a. **Physical examination** reveals granulation tissue at the junction of the bony and cartilaginous canal. There may be exposed bone in the canal. Facial nerve paralysis may be present.

   b. **Computerized axial tomography** (CAT scan) can aid in dx by showing destruction of bone.

   c. **Cultures** should be obtained. *Pseudomonas* or *Proteus* are most often causative organisms.

3. **Management** consists of high doses of tobramycin and ticarcillin intravenously (often for weeks), topical aminoglycoside drops, and judicious debridement of devitalized bone or areas of accumulated pus. Oral antipseudomonal drugs such as ciprofloxacin may replace IV antibiotics in early cases, and may also allow for early cessation of IV medication. In the diabetic, careful control of the diabetes aids in recovery. The immunosuppressed patient needs aggressive medical intervention.

G. **Exostoses.** Exostoses are seen as smooth subcutaneous swellings of the bony external canal and are usually asymptomatic unless they entrap water, causing external otitis. In rare cases, exostoses completely close the ear canal, causing a conductive hearing loss, wherein surgical removal is indicated.

H. **otomycosis**: Otomycosis is a subacute or chronic superficial fungal infection of the external auditory canal. Most fungal ear infections are caused by *Aspergillus niger* and *Candida albicans*. Predisposing factors of otomycosis include chronic infections of the ear, use of oils,
eardrops, steroids, swimming (wetness predisposes to fungal infections). Management is by regular suction clearance of the ear and topical broad spectrum antifungal.

**I. Tumors.** Although rarer than those of the auricle, basal cell and squamous cell carcinomas can involve the external canal. Neoplasia should be suspected when otitis externa is refractory to therapy. Persistent granular or necrotic tissue should be biopsied. An adequate biopsy will establish the diagnosis. Radical surgery is usually required.

**Diseases of the tympanic membrane**

**A. Bullous myringitis.** Bullous myringitis may be of viral etiology, although some reported cases have been caused by *Mycoplasma* infections. *Haemophilus influenzae* infection can present with tympanic membrane bullae in a child.

1. **Signs and symptoms.** Pain and a full feeling in the ear are common. The blebs can rupture spontaneously, causing a small amount of serous or serosanguineous drainage. Sensorineural hearing loss has been found in up to one-third of affected patients.

2. **Diagnosis** is made by the appearance of one or more "blebs" that are thin walled and involve only the squamous layer of the tympanic membrane. There may be an associated effusion in the middle ear. Unless there is a secondary infection, the pain subsides in 24 to 48 hours. The fullness may persist for several weeks.

3. **Management** consists of symptomatic treatment. An audiogram should be performed. If a new sensorineural component is identified, viral titers should be obtained (ie, EBV and CMV) and adjunctive steroid therapy considered. Narcotic agents may be required for pain control. Puncture of the blebs with a fine needle or myringotomy knife may provide pain relief, but is not usually recommended. Since only the squamous layers of the tympanic membrane is involved, careful puncture of the blebs will not produce a perforation. Antibiotics (eg, ampicillin) are of value when a concomitant otitis media is present.

**B. Granular myringitis** is an unusual disease of unknown etiology.

1. **Signs and symptoms.** Symptoms consist of itching, mild pain, and otorrhea. The otorrhea is usually sparse. Symptoms have often been present for many months before the diagnosis is made. The tympanic membrane is covered with granulation tissue that is often obscured by the discharge.

2. **Management** consists of long-term antibiotic steroid drops (4-6 weeks) and weekly cleaning. Broad-spectrum systemic antibiotics, culture-directed, are sometimes beneficial. In resistant cases, operative curetting of the granulation tissue and coverage with split-thickness grafts become a consideration.

3. **Complications.** Untreated cases can give symptoms for years and ultimately may heal by squamous overgrowth, producing a markedly thickened tympanic membrane and mild conductive hearing loss.
C. **Perforations (traumatic)** result from either direct trauma (eg, cotton-tipped swabs) or pressure transmitted to the closed canal (slap, explosion).

1. **Signs and symptoms** consist of pain, bleeding, a hollow feeling in the ear, and hearing loss. The appearance varies but usually consists of an irregularly shaped perforation with hemorrhage at the edges. Ossicles and other middle ear structures may be visible through the perforation.

2. **Diagnostic tests.** The initial evaluation must include an audiogram to rule out an associated ossicular discontinuity or sensorineural hearing loss. Associated vertigo warrants immediate attention by a specialist. Temporal bone x rays may be necessary to exclude a temporal bone fracture.

3. **Management.** The uncomplicated traumatic perforation usually heals spontaneously. The rate of healing depends on the size of the perforation. Perforations can heal in a few days or may take weeks to months. Perforations that have not healed after 6 months of observation can be repaired. Antibiotic drops are indicated only if there is contamination of the perforation by water or debris. Systemic antibiotics are not indicated. Pain medication may be necessary for the first few days following a perforation. The patient must observe water precautions (vaseline-impregnated cotton plug) until the perforation has healed and should be followed at regular intervals until healing is complete. An audiogram should be obtained at the beginning and end of treatment. With vertigo and a hearing loss - either sensorineural or conductive - an ossicular disruption or perilymphatic fistula is suspect. Emergent surgery may be necessary in this setting.

E. **Tympanosclerosis.** Tympanosclerosis is a pathologic condition of the tympanic membrane (and occasionally of the middle ear) consisting of chalky white, plaquelike patches occurring at any site within the membrane. The patches consist of hyaline degeneration of the membrane with calcium deposition and usually result from repeated bouts of inflammation. When localized to the eardrum, tympanosclerosis represents a benign condition.

1. **Signs and symptoms.** Hearing loss is not evident unless extensive involvement of the entire tympanic membrane is present. It is differentiated from cholesteatoma by its chalky white, plaquelike appearance as compared to the pearly white, cheesy appearance of cholesteatoma.

2. **Management.** Treatment is not indicated.