Initial Evaluation of the Patient with Otologic Problems

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In industry the nurse is usually the initial medical contact of the patient with otologic problems. Frequently, the nurse must initiate investigation or treatment without the immediate availability of a physician for guidance. This places an unusually heavy responsibility upon the nurse, and only with exceptionally broad knowledge of the field of otology can she properly discharge this responsibility.

The diagnosis of otologic conditions may be simple and straightforward or may be obscure and require sophisticated diagnostic techniques. Even in difficult cases, where the diagnosis is not immediately arrived at, the nurse must be able to determine the urgency of the problem. In this communication we shall endeavor to provide some practical aspects of otologic conditions which we feel would be useful for the nurse in such a situation. We will do this by discussing the important characteristics of the various otologic conditions which are likely to be encountered in industry. By no means are we attempting to provide a complete review of the field of otology as this guide is only intended for the nurse who already possesses a good background of knowledge in this field.

EXTERNAL EAR CONDITIONS

Traumatic injuries to the auricle deserve early, careful attention as neglected or improper treatment may lead to unnecessary permanent disfigurement with subsequent undesirable cosmetic defects. When presented with such a patient, two factors are of prime importance:

1) Control the hemorrhage. The auricle has an excellent blood supply and a significant amount of blood may be lost if initial first aid treatment is not instituted. This bleeding can easily be stopped with a circular bulky pressure dressing. After this the patient should be seen by a physician as soon as possible so that definitive care is undertaken.

2) Inspect the auricle for missing portions. If there are severed segments, these should be found and sent to the physician for use in his repair. These are best preserved until use by wrapping in a clean moist cloth which has been packed loosely in a small container of ice. However, speed of repair is the more critical factor and delays in repair should not be caused by time lost in obtaining ice or suitable packing material. Even large evulsed portions of the auricle usually survive in place without undue delay. (Figure 1) In instances of devitalized large portions of the auricle that will not survive, it may be necessary for the physician to sacrifice a soft tissue and preserve the cartilage by burying this subcutaneously in the abdomen. The cartilage is then used for later reconstruction and is preferred, because of its intricate shape and convolutions, to other materials which may be used for reconstruction.

Burns, frostbites, contusions and hematomas of the auricle are best treated by a physician. However, a
sterile dressing placed over the area until this treatment is begun will often aid in prevention of secondary infection or extension of the injury. Early treatment, here again, is quite important.

Foreign Body

A foreign body in the external canal should not be manipulated without proper instrumentation and training. If the foreign body is not removed by placing the involved ear inferiorly and gently jarring the head, either by tapping the head with the heel of the palm or having the patient jump up and down on one foot, it is best not to attempt to remove the foreign body unless proper instruments are present. Unsuccessful attempts at removal will only push the foreign body further into the canal making later removal difficult.

A live insect in the canal can often be removed by placing the patient in a very dark room and shining a light in the canal. The insect will then usually crawl toward the light. If the insect does not crawl to the light, the canal should then be filled with alcohol, which is left in place for five minutes to be sure that the insect is dead. After this, removal is not complicated. If attempts are made to remove a live insect by instrumentation, this will usually cause the insect to bury deeper into the canal; permitting the insect to dig its claws into the external canal or tympanic membrane. Both of these actions on the part of the insect are quite painful for the patient. Additionally, removal of the insect in such cases may result in a laceration of the canal or tympanic membrane.

Cerumen

Blockage of the canal by cerumen occurs frequently, especially among employees who work in a dirty environment or around greasy machinery. The nurse should not attempt to remove it without direct supervision by a physician. Foremost to be avoided is the temptation to wash the cerumen out of the canal. This is not the innocuous procedure many believe, and should never be attempted without direct supervision by a physician. Even then, it is often preferable to remove the cerumen by other methods. Many patients have had tympanic membranes ruptured by such washing, and also patients who have had previous perforations often have otitis media as a result of this practice. I have personally seen patients who have required a mastoidectomy as a result of chronic otitis media; the onset of which began with ear syringing. Recently a nurse was sued by a patient whose tympanic membranes were ruptured when she attempted to wash cerumen from the canals (Brochman & Harpole, 444, p. 2d 25 [Oregon, July 25, 1968]).

If there is no history of previous infections or perforations, it is usually safe to begin treatment by instilling into the canal a solution of equal parts of 3% hydrogen peroxide and glycerin. This solution will usually soften the cerumen, thereby relieving the pain, if present, and making removal easier when the patient is seen by a physician.

External Otitis

External otitis is usually presented clinically as a diffuse infection of the entire canal and meatus. At the onset there may be only a sensation of mild irritation or pruritus. Later, in the acute phase, the presenting symptoms are a hot, burning sensation progressing to pain which is made worse by movement of the jaw such as chewing or by movement of the auricle. Initially there is a serous discharge which is soon followed by thick yellow purulent discharge. Hearing impairment is not present until late in the course of the disease when the edema becomes so severe as to produce physical obstruction of the external auditory canal.

Frequently a patient is seen with external otitis who has a tympanic membrane which appears quite reddened and thickened. The diagnostic problem then is whether the patient has external otitis and otitis media or only external otitis. This can usually be resolved by the Rinne test (Figure 2). In external otitis without otitis media, air conduction is greater than bone conduction, but when otitis media is also present the reverse is true. If untreated the acute phase will usually subside to a chronic phase which is characterized by low grade ear pain, tenderness, and a serous discharge plus erythema and edema of the canal and external auditory meatus.

When confronted with a patient who has external otitis, if the patient is in the initial phase, little harm can be done by starting the patient on one of the commercially available antibiotic-steroid ear drops. If treated early, the more serious phases of the condition are
The symptoms of the stage of tubal occlusion are indistinguishable from other conditions in which tubal occlusion is frequently present. (Example: adenoidal hypertrophy, allergy and aerotitis.) In this stage the symptoms are mild ear discomfort, slightly muffled hearing and a sensation of "stopped up" ears. When these symptoms are present, especially in a patient who has had an upper respiratory infection, the diagnosis can be confirmed by inspection of the ear, in which the canal will appear normal but the tympanic membrane will be slightly reddened and retracted. It is a good practice to begin such patients on topical nose decongestants and one of the systemic antihistamine-decongestant preparations. This may prevent the patient from progressing into more severe stages of otitis media.

The presuppurative stage is characterized by frank pain and erythematous tympanic membrane upon inspection. Again, these patients should be started on treatment. In all cases the patient should be seen by a physician once the condition has progressed past the tubal occlusive stage. The physician will usually prescribe antibiotics along with the decongestants.

In the suppurative stage, if the pain is severe, myringotomy may be necessary to relieve the pain and prevent tympanic membrane rupture. This is especially true if the response to medical treatment is not satisfactory. Myringotomy is also used in the late stages of resolution in which the fluid does not clear spontaneously from the middle ear cleft.

All patients who have had acute otitis media should be followed medically until such time as the ear is completely free of fluid. If not, though the fluid may have been sterilized by the treatment, this fluid may remain in the middle ear causing recurrent infection or permanent adhesions and subsequent decreased hearing.

Timely and proper treatment of acute suppurative otitis media is important as severe complications may result. The signs of these complications are listed below under chronic otitis media.

**Chronic Suppurative Otitis Media**

Chronic suppurative otitis media is defined as otitis media in which changes have taken place in the ear as a result of infections which will not reverse to the normal state spontaneously. The disease may be active (actively infected) or quiescent (infection not active but chronic changes present). Usually there is a history of repeated and/or long-standing infections and intermittent or chronic otorrhea and some degree of hearing loss. The treatment in these cases is not usually of an emergency nature and, therefore, should be delayed until thoroughly investigated by a physician. However, in patients whose history is consistent with chronic otitis media, and who develop any of the following symptoms: severe pain, headache, nausea, vom-
N WHICH EAR IS THE SOUND LOUDER?

Fig. 3 — THE WEBER TEST — Normally the sound is equally transmitted by bone conduction to both ears and is not heard louder in one ear than the other. Courtesy: Dr. Bruce Benjamin, Sydney, Australia

iting, vertigo, fever or facial nerve palsy — complications should be suspected. Emergency evaluation by a physician, preferably an otolaryngologist, is indicated.

Secretory Otitis Media

Secretory otitis media is a condition in which the middle ear is filled with non-infected fluid. This is primarily a disease of the pre-adolescent child, though again, it is not rare in adults. Symptoms of secretory otitis media are not unlike those of the suppurative stage of suppurative otitis media, though there is seldom a significant degree of pain. This condition usually follows an upper respiratory tract infection or occurs in patients who have been subjected to rather severe atmospheric changes such as flying or deep sea diving. However, this condition may also be a warning signal of other more severe underlying pathologic conditions. Occasionally the diagnosis can be confirmed by an air-fluid level seen through the tympanic membrane, but usually the diagnosis is not so easily established. All suspected patients can be started on decongestants until seen by a physician.

As there are occasionally underlying conditions causing serous otitis media, investigation by a physician should be undertaken, even if treatment is successful. For example, serous otitis media is frequently the first symptoms of carcinoma of the nasopharynx. This disease, if diagnosed when limited to the nasopharynx, has a moderately good cure rate. However, this neoplasm is often a rapidly growing one, and if not treated until neck metastases have occurred, the cure rate is decreased by 50%.

Evaluative Aids

We have discussed the more unusual external and middle ear conditions, and from this it is obvious that much information concerning the diagnosis and urgency of the otologic condition can be obtained by proper evaluation of the patient's symptoms. However, the nurse can greatly increase her acumen by learning to use the otoscope and recognizing some of the pathologic changes of the external canal and tympanic membrane.

The tuning fork is a valuable tool and the Rinné test (Figure 2) is probably the most useful of the tuning fork tests in evaluating patients with acute otologic conditions. In patients with external ear pathology, generally air conduction is greater than bone conduction, unless the canal is physically blocked which, of course, can be detected upon inspection. Hearing is usually grossly normal in these cases. When middle ear disease is present the bone conduction is greater and there is a moderate hearing loss. In inner ear conditions, the air conduction is greater, unless the loss is severe, at which time the patient may respond by stating the bone conduction is greater. However, the patient, if questioned, will actually note that he is hearing the bone conducted sound in the opposite ear.

The Weber test (Figure 3) is also helpful as the patient will hear the sound louder in the ear with the hearing loss caused by external or middle ear conditions, but will hear the sound louder in the uninvolved ear when the hearing loss is due to inner ear conditions.

Specific Symptoms

We have discussed some of the symptom complexes of specific disease entities, but have not dwelled upon any particular symptoms. There are three symptoms specific for ear diseases which may occur singularly or in combination. These are: hearing loss, vertigo, and tinnitus. These symptoms must be evaluated in relation to other symptoms but they in themselves deserve special consideration. All patients with any of these symptoms which are not readily attributable to the diseases previously discussed must be suspected of having conditions affecting the inner ear. Among these conditions are Meniere's Disease, labyrinthitis, vestibular neuronitis, acoustic neuroma, etc. The diagnosis and treatment of these conditions lie within the realm of the otolaryngologist. However, such patients in industry should be prohibited from any further work around machinery or from work in which they may sustain a fall as at times vertigo may be quite sudden in onset and occasionally severe. Also, the patient should not drive an automobile. Obviously, these patients should see a physician without undue delay.

Hearing Loss

Hearing loss without other associated symptoms is usually progressive in nature. Much has been written concerning hearing loss in industry, especially that related to stimulation deafness (acoustic trauma). This is an increasingly important aspect of the occupational health nurse's responsibilities. She is extremely valuable in audiometric testing and the many other aspects of hearing conservation programs in industry.