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Wax in the Ear

The skin of the inner two-thirds of the ear canal is only 0·1 mm thick and is tightly attached to the underlying bone and to the squamo-tympanic suture. It has no special function other than protection. But the skin of the outer one-third of the canal is almost an active organ. It is ten to fifteen times thicker than the skin of the bony meatus and contains ceruminous and sebaceous glands and hair follicles. Some of the hairs near the entrance to the canal exhibit a secondary sexual characteristic, being large and thick and occurring only in adult males. The sebaceous glands nearly all open into the lumina of the hair follicles, and the oily sebum oozes along the hair to emerge on the surface of the skin. The 1,000 to 2,000 ceruminous glands are deeper in the skin and are slightly modified sweat glands, resembling in structure and in reactions the apocrine glands in the axilla. The secretory portion of the gland has a capacious lumen and is surrounded by a myoepithelium. Secretion accumulates in the lumen until a stimulus reaches the myoepithelium, which then contracts, forcing out the secretion through ducts to the surface of the skin or into the lumina of the hair follicles. Wax is a mixture of the secretion of these two kinds of glands.

In Caucasians and Negroes ear wax is usually a pale honey colour, moist and sticky. In Mongolians it is usually grey, dry, and brittle.[1] The presence of wet or dry wax is controlled by two autosomal alleles and the distinction can be used as a basis for genetic studies. The alleles for type of ear wax may also control the development of apocrine axillary sweat glands, as in persons with wet ear wax the axillary glands tend to be numerous and their secretion may have a pungent odour, though this is not apparent until puberty. Further, the lipoid content of wet wax is greater than that of dry, a disparity suggesting that the ear wax alleles may control certain aspects of metabolism. Recently lysozyme and immunoglobulins have been detected in ear wax.[2] The proportion of IgA and IgG differs considerably in wet and dry wax. This further indication of a dimorphism is interesting in suggesting a reaction to environment.

The wax itself may have a protective function. In normal persons it is secreted as a liquid which dries on the surface of the skin, pulverizes, and disappears. Its production is perhaps allied with the process of epithelial migration from the surface of the tympanic membrane to the outside world. Dust is trapped in the sticky secretion and removed with it. Atmospheric bacteria and fungi associated with the dust are perhaps destroyed or controlled by the lysozyme and Ig constituents of the wax.

Sometimes, however, for unknown reasons, this mechanism fails and wax accumulates in the meatal canal. Solid atmospheric pollulants are trapped in the sticky mass, which may ultimately fill the channel. In some individuals wax plugs form regularly throughout life, in others only during certain periods. Often only one ear is involved. There may thus be two responsible factors, one which operates constantly and a phasic one which may be under the control of the hormones influencing physical development. Further, these occluding plugs may be soft or hard, presumably owing to genetic typing. Personal hygiene is not necessarily associated with their formation, though a locally dirty skin might add dirt to an already formed accretion; and an occupationally dirty atmospheric environment—for example, coal-mining—is also irrelevant as a primary cause of wax plugs.

As the formation of wax plugs is a constitutional condition, it can hardly be prevented. However, in some cases the skin at the entrance to the meatus becomes unhealthy, and picking at the ears is one cause of this by introducing infection with the finger nail. The practice of attempting to clean the ears with cotton wool on a probe or stick can also be harmful by rubbing away the protecting keratin layers and leaving the living skin cells exposed to minor trauma and then infection. Debris thus produced can form the nidus of a wax plug. Special measures of cleaning the meatal canals are unnecessary.

The meatal skin sometimes has a tendency to form scales, like the dandruff scales of some people's scalp skin, and these too may start a wax plug. This can often be prevented by instilling a few drops of glycerin occasionally, which dissolves the scales and then gradually evaporates and pulverizes. Oils do not disappear in this way and may cause epithelial troubles by gradual maceration. They can be useful to an otologist in cleaning a meatus, but are best avoided as self-administered drops.

Unwise efforts with cotton-wool applicators may push wax plugs deeper into the meatus, sometimes up to and against the tympanic membrane. In time all dry wax plugs become adherent to the outer layers of the skin and, if in contact, the tympanic membrane. Discomfort, deafness, and even occasionally vertigo may be the presenting symptoms.

Soft wax is easily syringed away if the anatomy of the

meatus is borne in mind, and the appropriate textbooks usually give clear instructions on the technique. A sterile nozzle is most important, as it is this part of the syringe which may traumatize the skin and introduce infection. Hard wax adherent to the skin should always be approached cautiously. It should be carefully eased away from the skin at one point, and the Jobson Horne loop and probe is an excellent instrument for the purpose. By carefully working round the periphery it may be possible to remove the plug as a whole. Otherwise, careful syringing into the gap between the meatal wall and the wax plug is often effective. The lotion goes inwards to the tympanic membrane, from which it rebounds and expels the plug outwards. The procedure is not without risk, as some degree of force is occasionally needed. The pressure exerted by a finger-operated syringe can rarely do any harm, but mechanically operated irrigators must be used with caution. A normal tympanic membrane stands a fair degree of pressure, but a thinly-healed old perforation may give way. It is therefore prudent to get a good history from any new patient. The syringe nozzle must always be under strict control and never forced into the meatus, as it may thereby damage the meatal wall or even the tympanic membrane itself or push the wax plug into it. In fact, it is often best to soften hard plugs with ear drops of plain glycerin for a few days before attempting removal, and if there is still some difficulty to refer the patient for specialist management. The lotion used in syringing can be plain water, if normal saline is not available, but it should always be sterile. A cerumenolytic lotion or oil would be a useful weapon, but in spite of many claims no preparation more effective than glycerin has yet been made.

The removal of wax plugs is essential, as sooner or later a skin reaction will occur ranging from a mild eczema to acute furunculosis. Fortunately, the procedure is usually simple, but there are difficult cases which demand considerable technical skill.

[1] Matsunaga, E., *Annals of Human Genetics*,1961-2, 25, 273.
[2] Petrakis, N. L., *et al.*, *Nature*, 1971, 229, 119.

Anxiety of Patients in Research

A recent report from A. H. Schwartz, of Yale University,[1] draws attention to an odd and somewhat disturbing situation. It is a fundamental principle of medical ethics that informed consent must be sought and obtained from any person before he is subjected to a research procedure. This was embodied in the World Medical Association's Declaration of Helsinki in 1964[2] and is the basis of the guidance given by the Medical Research Council[3] for any procedure which is of no specific benefit to the individual and may carry risk of harm. When true consent cannot be obtained, such a procedure should not be performed unless it is incidental to and does not alter the nature of a procedure intended for the individual's benefit. According to the Yale report the attempt to obtain true consent to a research procedure resulted in "overwhelming anxiety" in five of 19 children between the ages of 11 and 18.

The experience of overwhelming anxiety must be considered harmful. Therefore the attempt to obtain true consent becomes in itself a procedure which is of no particular benefit to the individual and may carry risk of harm. It follows that the individual must give his consent for an attempt to be made to obtain his true consent to the research procedure. This is clearly a nonsensical situation. The Yale findings should be thoroughly studied, for they deserve careful thought.

The research procedures required admission to a special research ward in hospital. Most of the patients were being investigated for short stature, and at least one had emotional problems about his disability. The preparation of each patient for the research studies in hospital included at least two joint interviews with the child and his parents, a visit by the child and his parents to the research ward in the company of the medical investigator, and advice from a social worker to the parents about how to prepare the child. Interviews with the investigator began from six months to one year before admission. Whether the length and intensity of the preparation may have worried some of the children is worth considering, for they might be expected to feel some uneasiness about a procedure which was thought to require so long a preparation. Is it possible that we can strive too hard for understanding and consent, and that this may have resulted in the anxiety that was noted in five of the patients? Yet of the 14 children who did not experience overwhelming anxiety only one showed awareness that his stay in hospital was in any way connected with research, so it seems unlikely that the explanations about research were excessive.

If these findings result in the loss of adolescent patients for research procedures of no direct benefit to the individual, some interference with research into the special problems of that age group may result—but how much is worth considering.

Most investigations appropriate to teenagers could probably be carried out on young adults. What is more disturbing is the possibility that the findings may apply to adults too. Schwartz's report will no doubt stimulate similar studies in older people, and medical men will be justified in awaiting the results of such work with concern as well as interest. There will be compelling obligations on them to take them fully into account.

[1] Schwartz, A. H., *New England Journal of Medicine*, 1972, 287, 589.
[2] British Medical Association, *Members Handbook*, p. 60. London, B.M.A., 1970.
[3] Medical Research Council, *Report for the Year 1962-3*, Cmnd. 2382, p. 21. London, H.M.S.O., 1964.

Hemifacial Spasm

Idiopathic hemifacial spasm, sometimes called clonic facial spasm, is a benign but troublesome condition in which recurrent contraction occurs in the muscles supplied by one facial nerve. It usually begins in middle age but has been described in adolescence.[1]

The condition generally affects first the orbicularis oculi, giving intermittent twitching of the muscles round one eye, but subsequently the twitching spreads to the muscles of the upper lip and eventually to all of those on one side of the face. Frequently the disorder is mild and may remain so for many years, while spontaneous remissions have occasionally been observed. But in other cases the twitching becomes progressively more severe, with resultant discomfort and increasing embarrassment. The spasms are not rhythmical but occur irregularly. They are easily distinguishable from