I conclude with an analysis of a day's meals, not perhaps such meals as we should take every day, but most of us can probably recall days when we have indulged to an equal extent.

BREAKFAST:	Protein (grams)	Fat (grams)	Carbo- hydrate (grams)
Tea or coffee	—	—	—
Milk, 5 oz.	5	5	7.5
Bread, 4 oz.	24	—	64
Butter, 1 oz.	—	25	—
Egg, one	6	6	—
Bacon, 2 oz.	10	30	—
Sugar, 1 oz.	—	—	30
Marmalade, 1 oz.	—	—	25

Total calories, 1,582.5.

LUNCH:	Protein (grams)	Fat (grams)	Carbo- hydrate (grams)
Beefsteak, 3 oz.	24	15	—
Potato, 2 oz.	2	—	12
Onion, 3 oz.	1	1	5
Bread, 2 oz.	12	—	64
Butter, 1 oz.	—	25	—
Cheese, 1 oz.	8	10	1

Total calories, 1,055.

Half-pint of beer—Extra calories, 170.

TEA:	Protein (grams)	Fat (grams)	Carbo- hydrate (grams)
Tea	—	—	—
Milk, 2 oz.	2	2	3
Toast, 2 oz.	12	—	64
Butter, $\frac{1}{2}$ oz.	—	12.5	—
Cake, 1 oz.	6	22	70
Sugar, 1 oz.	—	—	30

Total calories, 1,077.5.

DINNER:	Protein (grams)	Fat (grams)	Carbo- hydrate (grams)
Oysters, half-dozen	24	10	12
Soup (clear), 4 oz.	12	—	2
Turbot, 3 oz.	18	3	7
Hollandaise sauce, 1 oz.	1.4	1.3	0.25
Roast beef, 4 oz.	32	20	—
Potato, 3 oz.	3	—	18
Cauliflower, 3 oz.	1	—	5
Apple tart, 4 oz.	3.5	12	50
Cream, 1 oz.	1	6	1
Orange, one	1.5	0.25	25

Total calories, 1,339.55.

Beverages:	Calories
Martini cocktail	170
One glass sherry	84
Two glasses champagne	210
Two glasses port	180
	604

NOTE: 600 calories represents the extra energy required by a stone-mason carving a tombstone for two hours.

If you think I have been too generous in catering for you, let me recall Brillat Savarin's wise reflection: "It is one of the privileges of the human race to eat without being hungry and to drink without being thirsty; beasts have not this privilege, for it arises from reflecting on the pleasures of the table and the desire to prolong their duration."

REFERENCE

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THE "ACUTE EAR" IN GENERAL PRACTICE*

BY

DOUGLAS GUTHRIE, M.D., F.R.C.S.

SURGEON TO THE EAR AND THROAT DEPARTMENT, ROYAL HOSPITAL
FOR SICK CHILDREN, EDINBURGH

For years we have been accustomed to speak of the "acute abdomen," an expression which must recall to the mind of every practitioner recollections of the anxiety and heavy responsibility entailed in the conduct of any case of this nature. Certain emergencies connected with the ear are often as serious as those of the abdomen, and it would appear as though the more serious varieties of "acute ear" had been much in evidence during the past few months. Whether this is the result of a warm summer and consequent popularity of swimming pools it is difficult to say. Certainly the percentage of severe ear infections has recently been greater, and in consequence the mortality of the "acute ear" higher. Any little contribution to our knowledge of the subject must therefore be of value, and must assist us to mitigate the fear which the word "mastoid" at present produces in the mind of the average layman.

CAUSES AND CLINICAL COURSE OF ACUTE MIDDLE-EAR SUPPURATION

Acute suppurative otitis is a disease of extreme frequency, especially in childhood. In the majority of cases the ear trouble is preceded by an ordinary head cold or tonsillitis, the infection passing from the nasopharynx to the tympanum by way of the Eustachian tube. It is a common complication of measles, and is also a common accompaniment of scarlet fever. The most frequent cause is a cold, the result of chill, and the organism most often found is the streptococcus. Infection by way of the external auditory meatus is relatively rare, and is usually the result of an accident, such as the penetration of a foreign body or a rupture of the membrane from an explosion or blow on the ear.

The following brief account of a typical case of acute otitis will illustrate the symptomatology.

A boy, aged 9, who had had a cold for a week, complained of sudden pain in one ear. This passed off in about ten minutes but returned a few hours later, and continued to return at brief intervals. When I saw him the tympanic membrane was of deep red colour and slightly bulging near the centre. On incising the membrane there was a gush of thin sero-pus, and pain was at once relieved. The discharge was profuse for four days, and then gradually diminished. As usually happens, the deafness was the last symptom to disappear.

Pain in the ear is the leading symptom in most cases of acute otitis, and may, indeed, be the only symptom. In such circumstances it is well to remember the common causes of earache. A boil or furuncle in the meatus may cause earache, deafness, purulent discharge, and rise of temperature and pulse rate, and, if the meatal wall is swollen, diagnosis may only be possible after repeated observation. Other causes of earache are an unerupted wisdom tooth, a carious molar, arthritis of the temporomaxillary joint, tonsillitis, nasal sinus infection, and herpes auris. The mere recital of such causes illustrates the importance of complete examination in every case.

ATYPICAL VARIETIES OF ACUTE OTITIS MEDIA

A. Latent Otitis in Infants.—In small children there may be no symptoms pointing to an affection of the ear

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—the so-called "latent otitis." The child is obviously ill, the temperature may rise to 103° or more, there may be vomiting or diarrhoea, and in some cases photophobia and head retraction may cause a suspicion of meningitis.

An infant, aged 9 months, was admitted to a medical ward of the Royal Hospital for Sick Children with indefinite symptoms of this nature. The tympanic membranes were not inflamed, but on both sides the light reflex was absent—an important sign. On incision a little sero-pus escaped. The temperature at once fell to normal and the general condition speedily improved.

Cases of this nature, not at all uncommon, demonstrate the need for otoscopic examination of every sick child.

B. Septicaemic Otitis.—Sometimes, both in child and in adult, although the otitis is apparent, the general toxic symptoms are so severe as to appear out of all proportion to the local ear condition. The infecting organism is the haemolytic streptococcus, and the patient presents all the symptoms of acute septicaemia.

An officer, aged 45, returning home tired after a day's shooting, was suddenly seized with severe earache, shivering, and nausea. His temperature rose to 104° and he appeared profoundly ill. When seen a few hours after the onset of the symptoms the tympanic membrane was convex, devoid of the usual landmarks, and of deep purple hue. On incision there was a gush of sero-pus. Next day he was still very ill, and complained of pain in the knee and hip-joints. There was no sign of mastoid involvement or of any intracranial infection. After incision of the tympanic membrane the ear continued to discharge freely for ten days, during which period the temperature gradually fell and the general condition improved.

Early paracentesis is of supreme importance in cases of this nature and will often avert mastoiditis and other serious complications.

OTOSCOPIC APPEARANCES IN ACUTE SUPPURATIVE OTITIS

From what has already been said it will be obvious that the diagnosis of otitis is based upon careful scrutiny of the tympanic membrane. Every practitioner ought to carry an electric otoscope in his bag and use it very frequently. It is a simple and inexpensive instrument, gives a magnified image of the drumhead, and has a Seigle pneumatic attachment, which is often most useful. The early stages of acute otitis cause redness of the upper and posterior part of the tympanic membrane and of the handle of the malleus, and dilated capillaries are often seen, radiating from the centre. Gradually this red and bulging area extends until the entire membrane is involved. In severe and septicaemic cases this may only take a few hours. Unless relieved by paracentesis the drum will rupture, and just before this occurs a minute yellow pulsating spot may be visible. While this is the usual course of events, there are cases of milder severity in which the membrane may appear wrinkled, devoid of normal lustre, and covered with minute shining specks as though dusted with powdered glass. Sometimes, instead of the usual redness, the membrane shows a canary-yellow colour. In my experience this is commoner in young children. In influenzal cases one or more purple blebs or bullae are visible, not only on the surface of the membrane, but also on the adjacent meatal wall.

APPEARANCE IN THE CHILD

It is well to remember that the normal tympanic membrane in the infant differs from that of the adult. It is nearly horizontal in position, and the plane therefore appears to be almost continuous with that of the superior wall of the meatus. It is oval rather than circular, and the handle of the malleus is not clearly visible. Anterior

and posterior folds extend across the membrane from the short process of the incus, appearing like the wings of a bird in flight, while the cone of light, or light reflex, extends downwards to the lower margin. Disappearance of the cone of light is one of the earliest and most reliable signs of otitis media in the child. As acute otitis develops the membrane becomes red, and a bulging area appears in the upper and posterior part, diminishing gradually in front, an appearance rather suggesting an apostrophe or inverted comma. The inflammation continuing, the tail of the apostrophe extends around the drum margin until it meets the head, and the entire drum membrane then appears to bulge, a slight dimple remaining in the centre where it is anchored to the malleus.

HOW AND WHEN TO INCISE THE TYMPANIC MEMBRANE

An abscess of the tympanum must naturally be treated like any other abscess—by incision and drainage. In mild cases, and even in the very early stage of more acute cases, pain may be relieved by the use of glycerin containing 5 per cent. pure phenol. The addition of cocaine is of no advantage, as the phenol is itself a good local anaesthetic. The drops must be carefully compounded, otherwise they may burn the meatus. Local application of dry heat is comforting to the patient, and may be continued even after incision of the membrane. A small electric heating apparatus has been devised for this purpose.

As soon as the presence of pus is suspected the drum should be incised. The small operation of paracentesis tympani can scarcely be too frequently performed. It is the simple, safe, and successful method of dealing with acute suppurative otitis. The best form of paracentesis knife is not the spear-pointed type, which makes a mere puncture, but is shaped like a dinner knife and sharpened on both edges. With this instrument a definite incision is made in the posterior part of the membrane, extending into the adjacent upper wall of the meatus. As the inflamed drum is acutely sensitive, a short general anaesthesia with ethyl chloride is essential. A gauze wick soaked in rectified spirit is introduced as a dressing for twenty-four hours. After that time only a pledget of wool is placed loosely in the ear, and renewed at frequent intervals.

ACUTE MASTOIDITIS: SYMPTOMS AND DIFFICULTIES OF DIAGNOSIS

While the great majority of cases of acute suppurative otitis run an uncomplicated course a careful watch must always be kept for the appearance of mastoiditis. The following is a very usual history of mastoiditis in a child.

A girl, aged 3 years, suffered from pain in the right ear. Next day the ear discharged profusely and the pain abated. A week later the mother noticed a swelling behind the ear, and brought the child to hospital.

A case like this presents little difficulty of diagnosis. The antrum in the young child is so near the surface that pus readily escapes and forms a superficial abscess. This has been found in one-third of our cases at the Royal Hospital for Sick Children. In older children, and in adults, mastoiditis causes pain behind the ear, with mastoid tenderness and sometimes oedema. The temperature is a very uncertain guide, and may not rise above the normal line. As mastoiditis develops, the aural discharge, instead of diminishing, as in a simple acute otitis, may continue, and may become more profuse. The two conditions most frequently mistaken for mastoiditis are a boil in the meatus (furuncle), and abscess of the lymphatic gland, which lies upon the mastoid process. A furuncle may cause mastoid tenderness and oedema,

with forward development of the auricle. The hearing is good and the tympanic membrane normal in appearance, but when the meatus is so swollen that the membrane is not visible, correct diagnosis may be very difficult. Suppuration of a lymphatic gland behind the ear may accompany impetigo of the scalp and may simulate a mastoid abscess, but otoscopic examination will reveal a normal ear.

An Uncertain Sign

The sign upon which a diagnosis of mastoiditis is usually based is the presence of tenderness over the mastoid area. Tenderness on pressure or on percussion is strong evidence of mastoiditis, but its absence does not signify that mastoiditis may be excluded. Indeed, in many cases of widespread mastoid infection tenderness is *completely absent*. This is noteworthy in cases of septic thrombosis of the lateral sinus. Of 150 cases of mastoiditis treated at the Royal Hospital for Sick Children, four cases were complicated by lateral sinus thrombosis, and in each of those four cases mastoid tenderness was absent. Diagnosis was based upon other signs, such as the characteristic remittent temperature. Moreover, mastoid tenderness is found in the early stage of many cases of simple otitis, and passes off within a day or two.

For example, a nurse, aged 24, suffered from sore throat for a week, then earache for two days, then aural discharge. When seen at this stage she had a temperature of 101°, profuse discharge of thin pus, and tenderness of the entire mastoid process. Two days later the tenderness was gone and the discharge was less. Within ten days the ear had returned to a normal condition.

Early mastoid tenderness, therefore, is of less diagnostic importance than tenderness which appears a week or more after the onset of the otitis.

Unusual Types

The pus from a mastoid abscess may track in various directions. For example, when the cells in the root of the zygoma are infected pus may collect beneath the temporal muscle and give rise to swelling and tenderness above and in front of the ear—the so-called zygomatic mastoiditis. Again, the pus may escape through the inner aspect of the mastoid process and find its way below the sterno-mastoid muscle into the tissues of the neck, causing a tender swelling behind the angle of the jaw and below the mastoid tip; this is known by the undescriptive title of "Bezold's mastoiditis."

EARLY SIGNS OF INTRACRANIAL INFECTION

The intracranial complications of suppurative otitis media are fortunately rare. The symptoms are often so indefinite that the real cause is apt to be overlooked.

A little girl of 9 years was suddenly seized with headache, vomiting, and fever. The case was treated as influenza for a week and the vomiting abated; but the headache continued, and just before admission to hospital there was a rigor and the temperature rose to 103°. There was no discharge from the ear and no mastoid tenderness. On inquiry, however, it was ascertained that there had been a slight discharge from the right ear just before the illness, and on inspection a small perforation of the membrane was found. Thrombosis of the lateral sinus was suspected, and this was verified by operation, which revealed pus in the antrum and cells and a gangrenous and collapsed sinus wall bathed in thin blood-stained fluid.

This illustrates the difficulty of diagnosis in septic sinus thrombosis. It may readily be mistaken for influenza, endocarditis, typhoid fever, and other febrile diseases.

To quote another recent case:

A youth of 17, who walked to hospital, complained of double vision, swelling behind the left ear, and profuse discharge from the ear, which had lasted for a week. There had been practically no pain, but a paralysis of the external rectus muscle (sixth cranial nerve), the so-called Gradenigo sign, pointed to an infection of the apex of the petrous part of a temporal bone containing numerous air cells.

This type of mastoiditis, known as apicitis or petrositis, has recently attracted the attention of otologists. It is a serious condition, and may end in meningitis.

As a final instance of an "acute ear" with complications I will quote the following case.

I had operated on a boy, aged 14 years, for tuberculous otitis during the first year of his life. A radical mastoid operation had been performed, and, as sometimes happens the cavity had filled in course of time with that flaky, shining material known as cholesteatoma. This had produced a fistula of the external semicircular canal, and when the boy came to hospital for the second time he was suffering from giddiness, vomiting, and nystagmus directed to the opposite side. There was no fever and no rise of pulse rate. The mastoid region was tender, and pressure behind the ear immediately increased the vertigo. At operation the wound was reopened, the cholesteatoma removed, and the fistula demonstrated. All the symptoms disappeared and the boy rapidly recovered.

WHEN TO OPERATE

The treatment of mastoiditis is essentially surgical, but this does not mean that every suspected case should undergo operation forthwith. As already mentioned, mastoid tenderness is present in many cases of acute otitis, and although this may indicate a mild degree of mastoiditis, it may pass off within a few days under conservative treatment. Cases of this nature one must watch very carefully, noting any increase of tenderness or appearance of oedema, or swelling of the upper, and posterior wall of meatus, and observing the general condition of the patient—also his temperature and pulse rate—so that operation may not be unduly delayed. Mastoiditis is not in itself a fatal disease. By operating too early, before allowing time for the patient's resistance to take a part in combating the infection, we may actually precipitate a spread of infection to the blood stream (septicaemia) or to the meninges (meningitis). Too long delay is of course equally unwise. The decision to operate must necessarily vary according to the experience of the operator, and the essential fact which the practitioner should grasp is that every doubtful case should at once be brought under the skilled supervision of an otologist. As that course is not always possible, it is sound practice to operate when in doubt.

Having decided that operation is necessary, we must see to it that a thorough operation is performed. Although some cases of mastoiditis with a superficial abscess recover after simple incision, this is not good surgery, and one need only glance at a section through a pneumatic type of temporal bone to realize that all the suppurating air cells should be systematically opened and drained. When Neumann said that "the simple mastoid operation should be as radical as possible, and the radical operation as simple as possible," he meant that in acute mastoiditis a wide and free drainage was essential (leaving, of course, an intact tympanum) and that in chronic suppurative otitis the structures concerned in hearing should be preserved as far as possible.

[Mr. Guthrie then showed lantern slides illustrating the surgical anatomy of the temporal bone in the adult and in the child, the technique of otoscopy, the clinical features of mastoiditis, and the steps of the Schwartze operation.]