

doubt that exfoliation of the surface to any extent, however small, would have been attended with separation of the flaps and projection of the bone.

[The second case was a young woman, 22 years of age, with disease also of the left knee, of nearly three years standing. Frequent application of the moxa and other means having failed of affording relief, and the general health rapidly declining, amputation was resolved on.]

Profiting by former experience, I on this occasion made the anterior semi-lunar incision on a line with the lower edge of the patellæ, and had the integuments retracted before cutting into the joint above this bone. In other respects the operation was conducted as the first one had been, and when the edges of the wound were approximated, they came easily together, presenting a proper degree of fullness, without any straining or tension. The union was nearly completed by the first intention without any local or constitutional disturbance; the flaps, instead of showing any tendency to retraction, rather becoming more full and soft; and the patient presenting the aspect of one who had sustained some trivial injury, rather than undergone a capital operation. On the 14th day she was sitting by the fire, and took the dressings off without any assistance.

This case should, I think, remove any doubt that may have existed as to the safety of amputating at the knee, and consequently as to the expediency of doing so with a view to avert the danger of operating through the shaft of the thigh bone. It is upon this ground that I wish to found the operation, and therefore I have said nothing of some other advantages which might be mentioned,—such as the greater length of stump which, especially in females, must be desirable for the sake of appearance, and may, perhaps, be made available for using a support admitting of flexion at the knee,—or the facility afforded to employ the tourniquet, which causes serious embarrassment in removing the limb at any higher point.

I may remark, that the posterior flap must be made very long, and indeed to the full extent of the fleshy part of the gastrocnemii muscles,—care being taken, however, to avoid preserving more than a moderate portion in regard to thickness.—*London and Edinburgh Monthly Journal of Medical Science, May, 1815, p. 537.*

ON THE PATHOLOGY OF THE EAR.

By JOHN TOYNBEE, Esq., F.R.S., Surgeon to St. George's and St. James's Dispensary.

[In a former paper, published by Mr. Toynbee, in the 24th vol. of the *Medico-Chirurgical Transactions*, (1841,) he gave descriptions of several dissections of the human ear, "as evidence of the fact that the lining membrane of the tympanic cavity is frequently in a diseased condition." In another paper, in the 26th vol. of these *Transactions*, he says:]

Subsequent dissections, and a careful investigation of numerous cases of deafness in living subjects, have led me to the conclusion that the most prevalent cause of deafness is chronic inflammation of the mucous membrane which lines the tympanic cavity; and that by far the greater majority of cases commonly called nervous deafness ought more properly to be attributed to this cause. This opinion derives support from an observation made to me by Mr. Swan, that in the whole course of his multiplied aural dissections he has not encountered one single instance of disease in the internal ear; an observation which embodies the result of repeated examinations to which I have myself subjected that part of the organ.

At the same time that I advance this opinion as an inference fairly deducible from more than a hundred dissections, I am far from denying the necessity of more extended researches previous to its validity being admitted.

It is worthy of observation, that though some of the persons from whom the specimens were taken, were known to have been afflicted with deafness during life, and others died of diseases which produced affections of the ear, yet the greater number, while living, were not supposed to be deaf.

This frequent occurrence of pathological conditions in the organs of persons not ordinarily esteemed to be deaf during life, loses some portion of its singularity when more closely investigated. Slight defects of hearing are so common as scarcely to excite even a passing observation, and more serious cases, from the very frequency of the disease,—perhaps the most common to which man is subject,—make but a slight impression. It may therefore be presumed that the ear is often in a pathological condition, though disease may not have proceeded so far as to produce such an extent of functional derangement as would cause serious inconvenience to the person affected, or reveal his infirmity to others.

The tympanic cavity is lined throughout by a fine membrane, forming externally the interior layer of the membrana tympani; from which it can sometimes be detached without much difficulty. In this situation it also serves as a partial investment to the chorda tympani nerve, and as a tubular sheath to the tendon of the tensor tympani muscle. Internally it covers the surface of the promontory and the membrana propria of the fenestra rotunda; passes on to the margin of the fenestra ovalis, where it is reflected on the surface of the stapes; and lastly, surrounds the tendon of the stapedius muscle, and envelopes the ossicula auditus, with their connecting ligaments.

In the healthy state, this membrane is so remarkably thin and transparent, that its presence is not easily detected. It is composed of extremely fine and delicate fibres, and in structure exhibits strong analogy to the serous membranes. Over its surface extends a layer of very minute epithelial cells: these again are covered by others, which are flat, broad, and elongated, terminating in a row of well-developed and firm ciliae. The supply of blood-vessels is abundant; but they are so minute, and so rarely distended with blood, that, in the healthy state of the membrane, they are imperceptible. In disease, however, these vessels are very much dilated and surcharged with blood. In young persons the membrane is highly vascular, and when successfully injected, appears pervaded by plexiform ramifications.

Beneath the mucous membrane lie the ramifications of the tympanic nerve from the glosso-pharyngeal. In addition to the branches of this nerve, which have been described by Mr. Swan and Professor Arnold, I have been enabled, by the aid of the microscope, to detect numerous filaments, distributed to every part of the membranous lining of the internal wall of the tympanum; and their presence seems to offer a natural solution of the cause of the very acute pain which is experienced when there is inflammation of this structure.

In a healthy state, a small quantity only of mucus covers the surface of the tympanic membrane: the constant motion of the ciliae, already mentioned, tends no doubt to prevent its accumulation.

Inflammation of the mucous membrane of the tympanic cavity gives rise to various pathological conditions, which it seems to me may be divided into three stages.

In the first stage the membrane retains its natural delicacy of structure, though its blood-vessels are considerably enlarged and contorted, and blood is effused into its substance, or more frequently at its attached surface. Blood has also been found between the membrane and the membrana propria of the fenestra rotunda, and in very acute cases lymph is effused over its free surface. Instances of the presence of these conditions will be found detailed in the appended account of dissections.