THE TREATMENT OF ACCIDENTAL WOUNDS OF THE DURA DURING OPERATIONS UPON THE MASTOID PROCESS.*

DR. EDWARD BRADFORD DENCH, New York City.

While wounding of the lateral sinus occasionally occurs in operations upon the mastoid, wounds of the dura in the middle cranial fossa are comparatively rare—at least if we are to judge from cases reported. While I have not searched the literature thoroughly, I have been fairly conversant with otological literature for the past twenty-five years, but I do not remember seeing in print any article dealing with this particular subject.

The paper in question, therefore, is based entirely upon my own personal experience and consists of a series of cases in which, during the performance of the radical operation, unintentional entrance of the subdural space occurred. It is impossible to say in some of these cases whether actual healthy dura was perforated at the time of the operation or whether the instruments passed through a previously necrotic area. In certain of the cases it seemed to me that the dura must have been necrotic at the point of perforation. In other cases, I am certain that the dura was healthy and that the opening of the subdural space occurred through healthy dura, uninvaded by any previous pathological process. Each case will be briefly detailed and the conclusions drawn:

Case 1: A young adult, with a history of chronic suppuration, presented herself at the New York Eye and Ear Infirmary, and the radical operation was advised for the relief of this condition. The antrum was small and in attempting to enter it with a small gouge I found that the dura had been perforated. On enlarging the wound, the dura looked unhealthy and I was inclined to believe that the dura had been necrotic at this point, although, naturally, this could not be absolutely proved. The radical operation was completed, a narrow strip of iodoform gauze carried into the dural opening, the radical cavity packed off with iodoform gauze, and the posterior wound sutured. This patient had no untoward symptoms and made a complete recovery.

Case 2: Male, about 20 years of age, suffered from a chronic suppurative otitis media. The radical operation was advised for the relief of this condition. On removing the external wall of the

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tympenic vault the dura was perforated accidentally, on account of the fact that the middle cranial fossa lay exceedingly low in this patient. I was so confident that the external wall of the attic alone had been removed that I passed a probe inward, expecting to find the internal bony wall of the attic, instead of which my probe entered the brain substance. This patient had never had any previous cerebral symptoms, and as the experience occurred in the earlier years of my practice I was naturally greatly disturbed. The opening in the dura was packed off by a strip of iodoform gauze, the radical operation was completed in the ordinary manner, great care being taken to do a complete and thorough operation. The usual meatal flap was cut, and then the area of wounded dura was thoroughly exposed by the removal of the bony wall in every direction. A strip of iodoform gauze was carried just within the margins of the dural wound and was brought out of the external auditory meatus. The radical cavity was packed with a second piece of iodoform gauze and the posterior wound sutured. Absolutely no untoward symptoms followed. The gauze from the radical cavity was removed on the second or third day and replaced. The gauze in the dural wound was allowed to remain in position for four or five days, when it was removed and carefully replaced through the meatus. Absolutely no untoward symptoms supervened in this case. The patient made a perfect recovery, and was under observation for a number of years after the operation. His suppuration was entirely relieved, and during the period of his convalescence as well as subsequently no cerebral symptoms developed.

Case 3: Male, about 40 years of age, suffering from chronic middle-ear suppuration, of long duration. The antrum was located high up, and was small. In attempting to enter the antrum a small, narrow gouge was used, and when the antrum had been supposedly entered I found a probe passed without resistance for a considerable distance. In other words, I knew that the probe had entered the brain substance. The bony wall around this opening was rapidly broken down by means of the gouge and the dura was found to look suspicious. I believe, in this case, that there had been a necrosis of the dura at this point, although I cannot be certain of this. The radical operation was completed, a small strip of iodoform gauze inserted through the dural opening, the radical cavity packed with iodoform gauze, and a third strip of iodoform gauze inserted between the packing entering the dural opening and that filling the radical cavity. The ordinary meatal flap was formed and the posterior wound sutured. This patient never had

a rise of temperature and never experienced any untoward effect. Ten days after the first operation the posterior wound was reopened and the entire cavity was grafted by means of a Thiersch graft. The patient made an uninterrupted recovery. It is now ten years since this operation, the patient is in perfect health, and has never suffered from any cerebral symptoms.

I omit here two cases of similar conditions found at operation, where, in one case, the dura had been accidentally opened by another operator, and a brain abscess was found later. Also, a second case, in which an eroded area of dura was found at the time of operation, leading into the brain abscess. Both of these cases have been reported in the series of cases of brain abscess presented by me at the International Otological Congress, in Boston, in 1912. One of these patients recovered completely, and the other died after being fairly well for a period of over three months. As these histories have all been published, I will not go into details here regarding them.

Case 4: A woman, between 30 and 40 years of age, presented herself at the New York Eye and Ear Infirmary, with symptoms of an acute mastoiditis. There were indefinite cerebral symptoms. The patient was immediately operated upon. The mastoid was found to be small, the inner table carious and the dura was entered with the curette. I believe here that the dura was necrotic, as every precaution was taken at the time of operation and it does not seem to me that an accidental wounding of healthy dura could have occurred in this case. The patient developed symptoms of meningitis, and in spite of operative interference died as the result of meningeal infection.

Case 5: The patient was a young man, who came to the New York Eye and Ear Infirmary over two years ago, suffering from a chronic suppurative otitis media for which the radical operation was advised. In this case the dura was accidentally entered. The bony margin surrounding the dural opening was removed in every direction, so as to expose a large area of dura. The dura was then opened by two right-angle incisions, about one-half inch in length, crossing each other. Iodoform gauze was lightly packed into the dural opening after the completion of the radical operation. This patient had a slight fever immediately after the operation; the temperature, however, never rose above 102°, and gradually sank to between 99° and 100°. He complained of slight headache but of no other symptoms. The posterior wound was not completely closed in this case, the dural packing being brought out through

the posterior opening. The patient was observed carefully and about ten days after the operation, showed, on examination by a prominent ophthalmologist of this city, a definite elevation of the optic papilla, on the operated side. I might say that the patient was also examined by another ophthalmologist who found no elevation beyond the physiological limit. I explained to my consultant that further operative procedure, in this case, would depend upon his decision. In other words, I had no other evidence of superficial brain abscess than that which would be afforded me by a beginning optic neuritis. The ophthalmologist saw this patient several times, and gave the absolute opinion that there was a slowly increasing swelling of the optic papilla upon the affected side. I, therefore, advised exploration of the wound, believing that I should be able to evacuate a superficial brain abscess. The patient absolutely refused operation and was therefore compelled to leave the hospital. He disappeared from observation, but I learned subsequently from one of my hospital internes that at least a year after the operation he was perfectly well. In other words, he made a complete recovery, and the slight optic neuritis from which he was supposed to suffer was probably an error in diagnosis.

Case 6: A young woman, suffering from a chronic suppurative otitis media, was advised to undergo the radical operation. The middle cranial fossa was very low in this case, and on removing the floor of the middle fossa, a small spicule of bone must have penetrated the dura. The dura was perfectly healthy in this case. The area of dural exposure was enlarged, and the dural opening was also enlarged by two crossed incisions at right-angles to each other. An iodoform gauze packing was introduced through the dural opening and the radical cavity was packed off with iodoform gauze, in the usual way. A third strip of gauze was inserted between the gauze draining the subdural space and that filling the radical cavity. The posterior wound was completely closed. A dressing was made on the third day after the operation and on removing the gauze packing from the subdural space about a quarter of a teaspoonful of softened brain tissue escaped. The patient was anesthetized, the posterior wound opened, and this localized necrotic area in the brain substance packed off with iodoform gauze. The radical cavity was also packed with iodoform gauze, and a third strip of gauze carried between these two packings so as to separate them. This patient made an absolutely uninterrupted recovery.

I have been led to report these cases because they seem to demonstrate that even accidental opening of the dura, at the time of the radical operation, is not necessarily followed by severe sequelae, provided the operator is careful to preserve perfect technic during the operation, and to do a complete operation, even although necrotic dura may be found or an accidental opening of healthy dura occur in the early stages of the operative procedure.

I believe that the favorable termination in all of these cases was due simply to the fact that perfect asepsis was maintained during the entire operation. The wounded dura was meddled with as little as possible and as soon as it was found that the dura had been opened a packing was placed over this opening, so as to prevent the entrance of any infectious material during the remainder of the operation. Great care was taken in these cases to make the operation particularly thorough, and to see that no focus of infection remained in the middle ear.

From the report of the cases it seems practically immaterial whether or not the original opening made in the dura be enlarged. In other words, my earlier cases, in which the small opening in the dura was simply occluded with a plug of iodoform gauze recovered as completely as did the later cases, in which the dura was more freely opened by crossed incisions, at right-angles to each other.

I believe, however, that in these cases the proper plan of procedure is to first remove the overlying bone about the wounded dural area over a considerable extent, in order to expose a large area of dura. I believe then, after every trace of disease has been cleared from the tympanic cavity, that the dural opening should be enlarged by two crossed incisions. Iodoform gauze should now be rather firmly packed into this opening, with the idea of causing sufficient pressure to secure an amalgamation of the cerebral membranes immediately about the wounded area. In this way general meningeal infection will be avoided. If an acute cerebritis occurs and this, of course, is a danger always to be thought of—the infected area will be freely drained and the danger of extension of the cerebritis will be very remote. This is the plan of procedure which I have followed in my later cases, and it seems to be entirely satisfactory.

It will be noted that in only one instance did death follow this accident, and that was in a case of acute mastoiditis with probable meningeal involvement before operation.

I have hesitated to present a paper of this kind, because no one appreciates more keenly than do I the actual danger of dural wounds during the course of operations upon the tympano-mastoid tract. I have presented it, however, because it seems to me that it is time some definite plan of treatment should be formulated for accidents of this kind, as they must occur to every operator of large experience. I do not wish to minimize the gravity of these accidents but simply to present a definite plan of procedure which, in my hands, has proved most successful in combating them.

15 East Fifty-third Street.

Case of Acute Hypertrophic Tonsillar Adenitis. AMEDEE PUGNAT.
Revue hebdomadaire de Laryngologie, April 11, 1914.

Moure reports two interesting cases of acute hypertrophy of the tonsils in children in whom a complete removal of the hypertrophied tonsils had been performed. In these cases, there developed a real acute tonsillar adenoiditis accompanied by fever and submaxillary adenoiditis. When the inflammation had subsided, there remained in one case on one side and in the other on both, extremely large tonsils obstructing the fauces and necessitating a second operation.

SCHEPPEGRELL.

Contribution to an International Inquiry on Ozena. J. DUVERGER.
Revue hebdomadaire de Laryngologie, April 25, 1914.

From an examination of a large number of persons of both sexes and all ages, Duverger finds that ozena is very rare in the Arabian race, and this in spite of the fact that the Arabs herd together in large numbers, it being not uncommon for six to eight individuals to be in the same room not counting the children. As animals, however, are never allowed to come into the houses, as is common elsewhere, and Arabs never approach a dog to fondle it, the author suggests that this may be a strong argument in favor of the canine theory of Perez.

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