T W O C A S E S
OF EXTENSIVE
ABSORPTION OF THE BONES OF THE HEAD

FOLLOWED, IN ONE OF THEM, BY

H E R N I A C E R E B R I.

BY

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CASE 1.—G. C—, æt. 24, was admitted into St. George's Hospital, under the care of Dr. Nairne, March 6th, 1850, with disease of the right lung, which commenced above a year before with severe inflammation, for which he was under treatment eight months. His present attack began, five weeks before his admission, with hæmoptysis, succeeded by sanguineous and muco-purulent sputa, and other signs of tubercles of the right lung.

Three days before his admission he felt pain on the right side of the head, soon followed by a swelling, without his having suffered in any way beforehand from any affection of this region. For this I was requested by Dr. Nairne to see him, and on the 15th, about twelve days after the occurrence of pain, I opened an abscess beneath the pericranium covering the lower part of the parietal bone. In

the early part of April, I opened a second abscess, and on the 12th, a third, so that a considerable part of the side of the cranium was now denuded of covering by the extension of the inflammation towards the occiput and forehead, the matter being unhealthy and scrofulous with flakes of lymph in it.

On the 19th, some purulent discharge took place from the right ear, which had not been affected at any previous time, and the disease was extending towards the vertex, where another incision was necessary.

Notwithstanding free discharge from these incisions, the disease, by the 29th, had extended across the vertex to the left side, where a fresh collection of pus required to be evacuated ; nine or ten incisions being altogether required in different parts, while the pericranium still continued to adhere in some parts between them. The strength of the patient gradually declined, and sometimes in the last few days he seemed scarcely conscious,—from exhaustion rather than from any local affection of the brain,—and he sunk on May 18th, about ten or eleven weeks from the first sensation of pain in the head.

On examination, the scalp over the crown and right side of the head was found thickened and infiltrated with serum, and the pericranium was separated from the bones over almost the whole of these parts, except towards the anterior part of the frontal bone, and it was thickened and presented an appearance somewhat like brawn.

The entire parietal bone, the right half of the occipital, the squamous and mastoid portions of the temporal bone, and a considerable part of the frontal, together with a part of the greater wing of the sphenoid entering into the right zygomatic fossa, were affected on both surfaces with caries. Very delicate and thin layers of new bone, of a whitish colour, were deposited on the internal surface of the frontal and occipital bones, but only to a slight extent. The interior of the mastoid cells and the cavity of the tympanum were filled with purulent fluid, and their lining membrane was thickened. The small bones of the ear were entire ; but

the membrana tympani was perforated. Corresponding to these affected parts of the cranial bones both the pericranium and dura mater were found altered, rough, and thickened, and detached from the bones, quantities of thin, flaky, purulent fluid intervening. The pericranium and dura mater were both thickened; but the smooth serous surface of the latter was unaffected. The superior longitudinal and right lateral sinuses, as far as the petrosal, were obliterated by fibrinous coagula. The brain was healthy.

Where least affected by caries the bones presented a worm-eaten appearance; but towards the front of the right side of the head large openings existed, where the bone had been entirely absorbed, around which other portions were very thin, though not yet entirely absorbed. No part whatever had died.

The cavity of the right pleura was completely obliterated by old adhesions, and the lung consolidated, with cavities towards the apex.

The kidneys were congested and the capsules adherent; and the liver was large and soft.

There is no doubt that the disease, in this consumptive patient, was scrofulous caries of the bones of the head; but, although the disease itself is not uncommon, this particular case may deserve attention on several grounds.

Scrofulous disease of the cranium usually occurs in one or more distinct tubercles, or deposits of strumous substance between the bone and the pericranium, or between the bone and the dura mater, which advance slowly towards suppuration, and, when situated externally, constitute strumous nodes of a round or oval shape, the periosteal covering shading gradually off into the undetached membrane. In a lad admitted for diseased hip into St. George's Hospital, cerebral excitement ending in coma, caused death in a few days after pain in the head was first complained of, and the early stage of this form of the disease is very well seen in the preparation on the table. In this case six or seven tubercles with roughness and excavations in the surface of the bone existed on one or other side of the cranium, and one in the sella

turcica, while the other parts of the bones were quite healthy, the immediate cause of death being some scrofulous tubercles in the brain.

Sometimes, however, after injury, and perhaps when a strumous state of the system is less strongly developed, there is general inflammation of the cranium over almost its whole extent, both surfaces being worm-eaten, as it were, with numerous depressions, filled with gelatinous fluid of various depths, or even entirely perforating the bone by numerous small openings. But even in these cases, as far as I have seen, if suppuration take place it is generally in separate small abscesses, like soft nodes, not numerous or over a great extent of surface at any one time, and only forming small perforations through the skull.

I have indeed seen the pericranium in children occasionally separated from the bone to a great extent; but it was in the form of acute inflammation without caries, or scrofulous deposit, and when opened by a small puncture, if pressure be employed, the pericranium may again unite with the bone without any exfoliation, or with the loss of a very small portion in the seat of the puncture, even when the abscess covers above half the head.

In the cases before described, the chronic nature of the disease is generally well marked, as successive portions assume from time to time a more advanced stage of suppuration and caries; and when a similar worm-eaten appearance of the skull is occasioned by the effects of syphilis and mercury, the disease is also found to be of a chronic kind, with the additional fact of extensive necrosis in many of the worst cases.

In this case, on the contrary, the disease commenced in one part of the side of the head, the first abscess being opened as early as the twelfth day after pain was first felt. From this part the inflammation spread with unexampled rapidity in all directions, though matter formed more rapidly in some parts than in others, so as to require separate openings; the whole duration of the case being little more than ten weeks, in which time more than half the cranium

became affected on both surfaces with the immense destruction observed in the preparation, and already described, instead of the small perforations usually observed.

It will have been noticed that suppuration existed in the mastoid cells and cavity of the tympanum and outer ear; but the inflammation clearly spread to the ear from the side of the head, where it commenced, and therefore the several parts of the ear were perfect in structure, and the patient had been quite free from previous affection of this organ.

The second case was in every respect, except the great loss of bone by absorption, different from the former, and differed in many respects from any other case I have seen.

CASE 2.—C. L—, æt. 36, was admitted into St. George's Hospital, under Mr. Keate, on the 2d of February, 1832, with a pulsating tumour, nearly five inches in diameter, on the upper and posterior part of the right side of the head; it was soft and elastic, with a well-defined boundary, and the pulsation could be felt and seen over its whole extent; in its centre a round fungus projected through an opening in the scalp, of the size of a small walnut, in which pulsation was also evident, and the apex of the fungus looked like layers of coagulated blood. The tumour was not tender to the touch, nor was there any apparent change over the adjoining bone. On the opposite side of the head, in the superior part of the left parietal bone, was a circular depression, about three inches in circumference, which was soft and elastic, and pulsated strongly, the edges of the bone not being abrupt or well marked round the aperture, and pulsation could also be felt in another smaller depression near this large one.

He complained of occasional pain in his head, which became very severe if he took any kind of stimulant; he was aware of some confusion in his ideas occasionally, and,

if he thought much, a sensation of giddiness came over him ; on lying down, or lifting his head from the pillow, he felt the tumour pulsate strongly ; and the least coughing, or straining, or stooping forwards, caused great pain in the tumour, which sometimes bled slightly. At night his eyes were dim, and *muscæ volitantes* passed over them. He had perfect use of his limbs, and passed his water naturally ; his countenance was yellowish, and rather flushed.

He had lived freely, and had been in the East and West Indies as a sailor and gentleman's servant, but had enjoyed good health, except a tendency to rheumatism ; twelve or fourteen years ago he had twice been salivated for chancre, but had not suffered since that time.

It appeared that two years and a half before, while asleep on the grass in the sun, he suddenly felt acute pain in the head, which remained more or less for several days, incapacitating him for work. Some time afterwards, the exact period being unknown, he first perceived a small depression in the situation of the tumour, of sufficient size to admit the end of his little finger. This depression went on increasing for six months, making greater progress when he suffered from cold, or when he had drank freely, the pain being at those times very severe ; and at last a tumour formed instead of the former depression. Eighteen months ago, and a year after the first seizure, he was laid up on account of the severity of the pain, and the increase of the tumour, and at this time his attention was drawn by his surgeon to its pulsation, which he had not himself noticed. Poultices were applied, and the tumour was punctured with a lancet, but only a little blood escaped. Attempts were made to induce suppuration, but the puncture healed, and he went about his usual avocations, suffering no great pain. A month afterwards it was again punctured, but with the same result, so that it may be presumed that the tumour was supposed to have been abscess.

From this time nothing more was done, the tumour not increasing in size, and only giving him occasional pain, and

not materially affecting his health till eight weeks ago, at which time, while walking in the street, he suddenly felt a sharp pain in the head, with giddiness and partial insensibility, which caused him to fall against the wall. He was supported home, and bled in both arms, and had leeches applied, and the tumour was punctured a third time, but again, as he believed, only blood escaped. He was only laid up for four or five days, and then went about again; but from that time the present fungus began to protrude through the opening, and has gradually increased. He has also some enlargement, like periosteal thickening, around the lower part of the femur, which is rather uneven, but not tender nor painful.

Some difference of opinion existed on his admission, on the 2d of February, as to the nature of this fungous tumour, whether it originated in the bone or dura mater, but its cerebral origin was, I believe, unsuspected; though at the present time it would probably be readily detected by microscopical examination. With such a fungus, however, in one part, and an aperture in the skull at another, it is not surprising that fungous tumour of the dura mater, or of the diplöe, should be suspected, rather than so rare a case as that of hernia of the brain from disease of the bone.

On the 8th, a ligature was passed, not very tightly, round the projecting fungus, which sloughed off on the 16th; and on this day Mr. Keate passed a needle, armed with a double ligature, across the base of the tumour, and tied each half separately, without the production of any bleeding.

On the 22d, except occasional headaches, nothing particular had occurred, and two or three portions of the tumour having sloughed off, and other parts being dead, the tumour seemed much less in size.

On the 25th, he was somewhat feverish, with shooting and throbbing pain in the head; the ligatures had separated with some more sloughs, but the tumour was again growing, with increased pulsation. This was partly relieved by bleeding.

On the 27th, there was some numbness of the right leg and left arm, and some dimness of sight, especially in the right eye, with increased giddiness on moving, accompanied by some fever and disposition to sickness.

On the 29th, a large part of the fungus came away, of a brownish colour, looking like fibrous coagulum, with soft blood-vessels, containing coagulated blood, and in parts the sloughs looked like medullary tumour around such blood-vessels. He was less feverish and ill.

On March 6th, though feeling better the last few days, he was languid and drowsy, and had some partial paralysis of the left side of the face, and the movements of the left arm were much impaired, with numbness of this arm, and, to a less extent, of the left leg also.

On the 8th, this arm was entirely paralysed, and the tumour was larger and more sloughy.

On the 12th, the whole of the left side was paralysed, and the right leg partially so; the sphincters were relaxed, and the evacuations passed unconsciously, and he had some difficulty in swallowing. The tumour was increasing, although portions sloughed off.

On the 16th, he became comatose, and died on the 20th of March.

The nature of this pulsating tumour was at once rendered plain by examination, and may be clearly seen in three preparations on the table, preserved in the Museum of St. George's Hospital.

The greater part of the calvaria has been dried, and it will be seen that towards the anterior part the bones are, to a great extent, very much thickened, being in some places half an inch thick; their tissue is firm and dense, like ivory, the *diplœ* being obliterated. Towards the posterior part, they are very thin, and, in many places, present large apertures, where, during life, the pulsations of the brain could be easily felt. The external surface of these bones is, for the greater part, rough and mamillated,

and the corresponding internal surface more porous than natural.

In another preparation, the remaining portion of the skull-cap has been preserved in spirit, in order to show the opening in the scalp through which the protrusion of the brain had taken place, and in it will be seen the complete adhesion of the dura mater to the integuments, while portions of the arachnoid and pia mater are observed hanging from the inner surface of the dura mater, to which they adhered, round the opening.

It will be observed, in a third preparation, that the fungus was not of large size at the time of death, and that an opening in its centre leads into an abscess of considerable size in the right hemisphere, almost as deep as the lateral ventricle, the purulent contents of the abscess having been discharged through the opening during life. The cerebral substance around the abscess and fungus, was vascular, and altered in colour, but was not otherwise diseased.

Every surgeon is familiar with the protrusion of the brain, which follows many cases of injury of the head, of recent occurrence, in which the removal of the bone leaves the dura mater exposed; but hernia cerebri from disease of the bones of the cranium is comparatively a very rare occurrence. The reason of this is obviously the chronic inflammation of this membrane, by which it is strengthened, so as to bear the loss of the osseous covering in cases of ulceration and necrosis, before the aperture is formed in the bone. Such thickening of dura mater also slowly follows injuries, when the patient survives the removal of portions of the cranium. In this case, on the contrary, if the edges of the opening are examined, it will be seen that the pericranium and the dura mater are both in a perfectly normal condition, even close to the irregular margins of the bone; and therefore the pressure of the dura mater against these rough edges appears to have been as injurious to the membrane as in cases of recent injury.

I have not myself seen hernia cerebri, even from extensive exposure of the dura mater after necrosis, and I am inclined to believe it must be still more unusual, when the integuments are entire, as in this case.

That the disease commenced in the bone, and not in the brain, must be evident from the depressions which preceded the protrusion, from the extensive disease of the calvaria in other parts, and from the fact that below the smaller apertures, in which the pulsation of the brain was seen without protrusion, the dura mater and the brain were quite unchanged. Here, therefore, the increasing size of the aperture in the bone might have been followed by the same results, if the patient had survived much longer, and the edges had become as irregular as those of the opening through which the hernia had taken place.

The exact nature of the disease in the bone may admit of some doubt, as it is, I believe, very unusual for the cranial bones in chronic inflammation to be seen with marks of so much healthy action as in this case. The ivory, solid thickening of some parts of the bone, and dense nature of the mamillated portions even among the ulcerated parts, where the bone had been thinned by absorption, are remarkably different from the soft worm-eaten appearance of the more common caries of the first case. It may, perhaps, be thought, from the patient having been subject to rheumatism, from the enlarged condition of the femur at its lower part, and from the commencement of the disease, while the man was lying on the grass, that the inflammation of the bone was of a rheumatic character; but if this conjecture be correct, such extensive absorption of the bone is at least very unusual; though an analogous ivory deposit on the articular ends of the femur and tibia, with depressions from absorption, are certainly sometimes seen in long-continued rheumatic inflammation of the knee joint.

There is nothing in the history of the case, or in the morbid appearances, which at all point to a syphilitic origin.

Supposing, however, that the disease was inflammatory,

whether rheumatic or otherwise, it seems impossible to give any explanation of the extensive absorption at one part, while other parts were immensely increased in density.

The opening in the bone having been formed by absorption, was succeeded, after an interval of at least some months, by a swelling of much greater diameter than the orifice in the bone, as if the dura mater had given way long before the small fungus protruded through the bone, and the cerebral matter had spread out between the bone and the integuments; but it may admit of doubt whether the brain would have forced its way through the scalp, had not repeated punctures been made by the surgeon's lancet—the last of these punctures having never healed, although the former ones had done so; and the fungus having soon followed the final puncture.