HISTORY
OF A
CASE
OF
BONY TUMOR

SUCCESSFULLY REMOVED FROM THE HEAD OF A FEMALE.

By ROBERT KEATE, Esq.

SURGEON TO THEIR ROYAL HIGHNESSES THE DUCHESS OF GLOUCESTER
AND THE PRINCE LEOPOLD,
AND SURGEON TO ST. GEORGE'S HOSPITAL.

Read June 22, 1819.

I HAVE the honor to submit to the Society the history of a case of bony tumor on the head of a female, which has been successfully removed by me, and which, in the event, proved to be an enormous collection of hydatids between the two tables of the frontal bone. I am not aware that such a case is on record.

In stating the symptoms and treatment after the different operations, I may appear to have gone too much into detail; but the novelty and importance of the case will, I trust, be deemed sufficient to excuse, if not to justify, the prolixity of the account.

Maria Arnold, aged 18 years, came, in March,

1815, to consult me about a large tumor on the frontal bone, chiefly over the left orbit, but extending partially above the inner angle of the right orbit also, and occupying the greater part of the left portion of the frontal bone.

She first discovered a small hard tumor about the size of a hazel nut, six years since, towards the lower part of the bone over the left brow, which increased slowly at first, but during the last three years its growth has been more rapid, and it now assumes the shape and size of three-fourths of a large orange ; the surface, however, is not quite regular.

She has felt uneasiness externally since the commencement of the swelling, attended with a sense of throbbing round the base, but till lately there have been no symptoms of internal pressure. She now feels intense headachs, with occasional vertigo, dimness of sight, nausea, and tinnitus aurium.

The tumor was evidently of bony growth ; and the immediate impression on my mind was, that it was between the two tables of the frontal bone, the external table being pushed forward, causing the convex surface of the protuberance, and the internal table depressed, giving rise to the present urgent symptoms.—I gave this opinion, accordingly, to her relation who accompanied her, and recommended an operation, to attempt

its removal. Finding, however, from him, that other opinions had been given, which did not accord with mine, I advised her being brought to St. George's Hospital, where she was accordingly admitted on the 31st of March.

In consultation with the other surgeons of the hospital, the same opinion predominated; and on the 3rd of April the operation was performed in the following manner:—

A crucial incision was made through the integuments covering the whole extent of the tumor; the flaps were turned back, and the bony covering of the tumor itself was exposed; it appeared very thin, and extremely vascular. It had been my intention to remove this protruding portion by sawing through the whole circumference of its base, close to the general surface of the os frontis; accordingly, by means of a large metacarpal saw, about one-third of the circumference was already divided, when, through the groove made by the saw, one of the surgeons who was assisting me, thought he perceived a pulsation, as if of the vessels of the dura mater, though this was not observed by myself. I determined, nevertheless, to detach a portion of the bone, in order to ascertain the precise nature of the tumor, before I proceeded further in sawing through the base. This was readily effected by the elevator, when a thin transparent membrane was discovered closely lining the bony

case ; but in breaking off this small piece of bone, the cyst was ruptured, and its contents, a thin colourless fluid, escaped ; the cyst at the same time collapsing into the cavity. This cavity was carefully examined by the finger. It presented an irregular surface, or floor, lined by the membrane above described, but evidently depressed below the general or proper level of the internal table : no pulsation was now perceptible, and no orifice leading through the internal table and communicating with the meninges, was discoverable. Some more small pieces of bone were then removed, but the patient had by this time become so faint and exhausted, that it was thought prudent to discontinue the operation, hoping that the remainder of the bony case or covering might be subsequently detached, or destroyed by acids or by other means.

A little dry lint was therefore applied to the surface of the cavity, and the flaps of the scalp simply laid over it ; when she was taken to bed nearly exhausted.

About four hours after the operation, I found the pulse much accelerated, and the pain of the part very severe : cold lotions relieved the pain, but in the evening it returned by violent paroxysms every ten minutes ; this pain was referred to the wound itself, and to the frontal sinus, and extended to the left temple. Pulse, at 9 o'clock, *p. m.* was 100 ; skin hot ; tongue covered with a white fur ; the

neutral draught, with liquor antimonalis, was directed; and she had taken forty drops of laudanum soon after the operation.

4th April.—She has rested but little during the night. The pain now complained of is continued, not occurring by paroxysms. Pulse, at eight in the morning, 104; at eleven o'clock, pulse 120. Pain referred to the wound only; tongue white and furred.

Eight o'clock, *p.m.*—The bowels having acted without giving relief to the pain, and the action of the pulse being rather increased, twelve ounces of blood were taken away. The blood was buffy, and its abstraction relieved the severity of the symptoms.

5th April.—She has felt much pain, though she had dozed about four hours during the night; the bowels had acted, and she had less thirst than last night. Pulse still between 130 and 140; the wound looked well; suppuration advancing; tongue more dry; pain still referred to external parts. Eight ounces of blood were taken away in the evening, which was less buffy than that of last night.

6th April, eleven o'clock, *a.m.*—She had three or four hours' sleep during the night. Pulse 130; less fever, and rather less pain. The cavity of the tumor tightly filled with coagulum, which now begins to separate. The bowels are kept open by

sulphate of magnesia added to the saline and antimonial medicine.

Eleven o'clock, *p. m.*—The heat of skin has increased, together with pain in the head; she complains also of considerable pain in the left side; the pulse is more frequent, and more full and wiry; now 150; twelve ounces more blood were taken away.

7th April, eight o'clock, *a. m.*—She has had a quieter night; pulse under 130; her tongue is not so dry, but she has still much burning pain in the tumor.

Eleven o'clock, *a. m.*—Pain in tumor still violent, as well as in the side; pulse very rapid. The blood taken away last night evinces no marks of inflammation; and the pain in the side appearing to me to be spasmodic, I gave her a large dose of æther and laudanum, which quickly relieved it.

8th April.—She had a tolerable night; pain in tumor less; complains of general pains in limbs; pain in side relieved, but not removed, by the anodyne; a blister was therefore applied, and at nine o'clock, *p. m.* she was much more easy and comfortable in every respect.

Sunday, 9th April.—She has passed a good

night, and is tolerably free from pain; during the day she was alarmed by hæmorrhage from a branch of the temporal artery, which was stopped by gentle pressure. In the evening, the pain in the tumor returned, and she complained of uneasiness about the throat, and distress from cough; these were relieved by tinct. camph. compos. The wound looks well, and suppuration goes on favourably.

10th April, eleven o'clock, *a. m.*—She is better this morning, though she has not slept much during the night. Pulse 110; cough better; complains of pain coming on generally over the head; skin cool; tongue moist; bowels regular.

Eleven o'clock, *p. m.*—She feels this evening more easy, quiet, and comfortable, than she has been since the operation; the wound discharges freely.

20th April.—From the 10th to this period she has gone on well; pieces of bone have been removed from day to day, and she has felt no pain.

13th May.—Kali purum has been occasionally applied to the bone to promote exfoliation, and pieces continue to be removed; the granulations, however, fill up the cavity and line the internal surface of the bone so rapidly, that it is with great difficulty kept exposed.

7th July.—The same kind of process has been going on, and the tumor is very much diminished in size.

She was now made an out-patient, but the same mode of treatment was continued.

10th September.—The caustic has been frequently applied to the granulations on the inner surface of the bone, and pieces have been occasionally removed; many parts have healed, especially on the outer side near the temple. Her health has been generally good, and she has been free from pain, except that occasioned by the caustic. On the left side of the wound, where the surface had healed very quickly after the operation, a small puffy tumor appeared about a month after she quitted the hospital, which I considered to be a part of the original cyst filling again; a small portion of its surface has been destroyed by the contact of the kali purum applied to the neighbouring granulations and bone, but no sensible increase or diminution has lately taken place in it.

On the evening of the 13th September she was seized with rigor and subsequent hot fit; pain in the wound and left side of head and face, with erysipelatous suffusion and tumefaction. With these symptoms continuing, she was this day (16th September), re-admitted into the hospital. Pulse 126. By gentle purgatives, diaphoretics, and other

usual remedies, she soon recovered, and left the hospital in good health. The kali purum was discontinued from this time, and we determined to let the wound heal, (which was rapidly effected) and to watch the event.

January, 1817.—The puffy tumor above-mentioned has gradually increased in size, and it is now nearly as large as the original tumor. Whenever it becomes very tense, the membrane and thin cuticle give way, and the contents (the same sort of thin limpid fluid that was originally discharged) are evacuated, when the cyst collapses, the opening heals, and the tumor fills again, and the same process goes on. This has been the case for two or three months; but as she has never had a return of pain or of the distressing symptoms which demanded the original operation, she is averse to the trial of any farther means for its removal.

February 10.—The tumor or cyst, which, as stated above, has occasionally given way and discharged its limpid contents since she left the hospital in July, 1816, has now increased to a great extent, and protrudes beyond the limits of its former bony covering; the bony base, even of the tumor, is elevated where it was originally removed by the saw to the level of the surrounding bone; and the general circumference of the base is evidently enlarged.

She has lately also felt more pain in the tumor and in the left temple; her health, too, has been slightly affected, particularly in the recurrence of pain in the side, with disordered stomach and bowels; the pulse is quick and weak, and the tongue white.

Under these circumstances she was this day, February 10th, re-admitted into the hospital.

By attention to the constitutional symptoms the health was soon restored. In the mean time, on 12th February I punctured the cyst, and about four ounces of a clear straw-coloured fluid escaped; the cyst collapsed, but under it there appeared to be a soft tumor filling the cavity within the bony prominence; this gave me some apprehensions as to the nature of the disease, but I determined to make a larger opening when the cyst should again be filled; accordingly, on the 17th, I applied kali purum to the tense surface of the tumor.

21st February.—The contents of the tumor, nearly four ounces, have been this day evacuated from the opening made by the caustic; and a membranous bag, evidently an hydatid, though unluckily ruptured, has come away with the discharge. This appearance of an hydatid gave me confidence as to the mode of treatment, and I repeated the application of the kali purum till the whole covering of the tumor was destroyed. This disclosed a number of separate cysts lining the

cavity; and to these the caustic was freely and constantly applied from February to June, as well as to the granulations lining the inner surface of the remaining upper plate of bone. Nitric acid, sulphas cupri, and other escharotics, have also been applied; but the cysts are slowly destroyed, or rapidly reproduced, and the bone exfoliates but slowly.

In consultation on the 25th of June, it was determined to try the actual cautery, which was applied, on the 27th, to the inner surface of the cavity, and of the elevated bony plate. To avoid the alarm, however, which the red-hot iron was calculated to produce, it was used at the temperature only of boiling water. This application gave her intense pain, not only in the tumor, but over the head generally, and which continued so as to destroy her rest for two nights, producing also accelerated pulse, hot skin, great thirst, and disordered bowels.

29th June.—The cautery not having produced, on the parts to which it was applied, any better effect than the kali purum, the latter was resumed and continued to the 23rd August, when her health began again to suffer, and she left the hospital for change of air on the 3rd September; up to which period about twenty-eight hydatids had been destroyed.

In the beginning of October she again became an in-patient, being anxious to persevere in the plan, which seemed to be destroying, though tardily, the disease under which she had so long suffered.

The kali purum having been so slow in its effects, I determined to try, with caution, the arsenical caustic; which was accordingly applied on the 8th of October. A very large and deep slough was produced by this application, which appeared to remove the greater part of the remaining hydatids. There were still, however, imperfect cysts, particularly at the outer part of the tumor near the left temple, and at the upper part of its base, to which, emboldened by the success of the first trial, I again, on the 21st, applied the arsenical caustic. On the evening of this day she was seized with rigors and vomiting, which lasted during the night: but after taking effervescing neutral draughts, with potassæ sulphuretum, these symptoms subsided during the day of the 22nd. They returned again in the evening, and yielded to the same treatment; after which they did not recur; the ejected contents of the stomach were of a very bright green colour.

28th October.—The slough, from the arsenical caustic of the 21st, separated this day from nearly the whole internal surface of the cavity, leaving only two distinct cysts visible at the lower and anterior part just over each frontal sinus. I passed

a probe into each ; the cavity was trifling, and did not penetrate the sinus ; but on pressing the bottom of the left cavity, she felt acute pain in the eye of that side.

30th October.—She has for the last two or three days suffered severe pain in the head, particularly a sense of tightness across the forehead, and pain in the globes of the eyes. Leeches freely applied, and frequently repeated, removed these symptoms.

25th November.—The arsenical caustic has not been ventured on since the 21st October ; but as her health improved, the cysts have been touched with kali purum, argenti nitras, cupri sulphas, &c. and a small portion of bone has exfoliated. Some new appearances of hydatids, however, have shewn themselves on the upper and left side of the tumor.

She complains so much of the continual pains inflicted by these severe applications, although she has borne them all with exemplary patience and fortitude, that she has at length assented to my proposal, again to cut down upon the bone externally, in order to remove the whole remaining eminence by the saw. The proposed operation was performed on the 5th December, 1817.

The integuments were turned back from the outer surface of the prominence, and the base was

laid bare through its whole circumference. The lower portion was first removed by a strong metacarpal saw, and subsequently the upper portion; so that the whole prominent bony ring was sawn through close to the sound and healthy surface of the surrounding bone; the largest diameter of the base thus cut through by the saw was four inches and a half; the smallest diameter, four inches.

In the very hard and compact bony substance forming the base of this extraordinary tumor, were found five or six cells containing hydatid cysts. Three of these cells in the upper part of the base were divided by the saw through their centres, and two or three in the lower portion of the base; so that the inferior sections of the cells or cavities were left as depressions in the surface, lined with corresponding portions of the cysts; these cysts were carefully removed, and the bone exposed. The original large cavity, which had formed the centre and greater mass of the tumor, from whence there had been such a rapid and inveterate growth of hydatids, was also denuded throughout of its cysts and granulations, and the inner table of the cranium entirely exposed. A large cell over the frontal sinus was similarly treated; and lint, impregnated with a strong solution of sulphate of copper, was applied to the whole of the denuded surfaces.

16th December.—Notwithstanding the repeated applications of this lint, healthy granulations have

risen from the whole surface of the exposed inner table. The cells in the compact bony texture of the base have been rubbed with nitrate of silver, as well as sulphate of copper; their surfaces are still exposed, and exfoliations will apparently take place.

It had been necessary, on the 13th December, to apply a dozen leeches to the temples, for the relief of pain in the head, and a sense of pressure over the temples; and, on the 24th, the leeches were repeated. No other untoward symptoms occurred, except a great disposition to diarrhoea. The granulations were very healthy, and were rapidly filling up the larger cavity; she was able to walk about, and cicatrization had commenced, when, on the 26th January, 1818, she was seized with rigors, pain in the chest, cough, and every other indication of a severe inflammatory attack of the lungs. She immediately lost twenty-four ounces of blood, and ten ounces more in the evening; had a blister applied to the chest, and proper medicines directed by the physicians; on the following day the bleeding was obliged to be repeated to twelve ounces. On the 28th, she was better; but some pain of the chest and fulness of pulse remaining, she was again bled to ten ounces, and the blister was repeated.

31st January.—She has been gradually improving, and the pain has been decreasing since the

28th; but the bleeding was repeated, for the fifth time, last night, on account of increased heat of skin and rapidity of pulse, though the pain of the chest was but little augmented.

This attack confined her to bed for about three weeks; and during this time, the secretion from the wound, and the growth of granulations nearly ceased, while cicatrization proceeded rapidly over the general surface, except where the bone was exposed and destroyed by caustics, from whence small exfoliations were from time to time taking place. The cavity is therefore greater than, from the previous growth of granulations, we had reason to expect.

On the 7th March, 1818, she left the hospital for the last time, in a very delicate state of health. During the last fortnight she had one or two severe attacks of pain in the left temple, which yielded, as usual, to leeches and a purgative. She had another similar attack a few days after she left the hospital, for which the leeches were again applied.

From this time to the 5th April, she went on well, gaining health and strength, and the wound healing every where but over the exposed pieces of bone, which were in process of exfoliating. The weather had for some days been very cold, with north-east winds, to which she had imprudently exposed herself; and on this day, 5th April, she

was seized with rigors, fainting, excruciating pain in the chest, and palpitation of the heart; in short, with all the symptoms of carditis. The violence of these symptoms was somewhat relieved by the immediate loss of twenty ounces of blood, with a large blister on the chest, and the medicines prescribed by her medical attendant (Mr. Freeman, of Spring Gardens), before I was sent for. Dr. Chambers, under whose occasional medical care she had been while in the hospital, was obliging enough to visit her with me at her own residence, and the repetition of copious bleedings, blisters, and the proper medicines, restored her, after some days, to a state of convalescence. She was obliged, however, to lose 12 ounces of blood so late as the 2nd May; since that period she continued to improve in health, and went soon afterwards into the country, where bits of bone have occasionally exfoliated, till at length the whole wound is healed, and her health greatly restored, as I have learnt by a letter from her uncle, in which he says,—“ It is with
“ much pleasure I inform you, that Maria’s head is
“ quite healed, and her general health greatly im-
“ proved. Several pieces of bone came away be-
“ fore it healed. She will come to town the early
“ part of next month.

“ I am, &c.

E. ARNOLD.

21, *New Street, Spring Gardens,*
September 26th, 1818.”

I have a cast of the head and tumor taken pre-

viously to the first operation on the 3rd of April, 1815, and one taken subsequently, at the time of her quitting the hospital in July, 1815.

Maria Arnold came to town in perfect health on the 22nd October.

October 30th, 1818.

P.S.—20th February.—I have again seen her this day; she remains quite well, and the appearance of the head is more natural and favourable than when the last sketch was taken.