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/ by Charles Stedman Bull.**

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Contributions to the Subject of Tumors of the Orbit and Neighboring Cavities

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BY

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CONTRIBUTIONS TO THE SUBJECT OF TUMORS OF THE ORBIT AND NEIGHBORING CAVITIES.¹

CASE I. *Adeno-sarcoma of the Lachrymal Gland.*—The patient, George G——, aged thirty-five, presented himself to me for the first time on May 30, 1887, with the following history: A little more than a year before he had noticed a swelling or tumor, as he thought, of the outer angle of the left upper lid; but after a while he discovered that the swelling was not in the lid, but was a tumor beneath the lid, and on the outer aspect of the left eye. There was at first no interference with the movements either of the lid or globe, and no sense of discomfort; but the tumor gradually increased in size and began to cause the patient some annoyance. It had never been painful nor especially sensitive on pressure, nor was there any interference with the vision. When I saw him, the outer end of the left upper lid was somewhat bulging, and the growth was seen to be applied closely to the eyeball on the upper, outer, and lower quadrants, and presented in the interpalpebral opening. On everting both lids, and making the patient look toward the extreme right, the growth was seen to extend backward and upward into the orbit, and to be connected with a glandular tumor at the site of the lachrymal gland. The tumor was distinctly lobular, reddish in color, somewhat firm in character, and perfectly movable beneath the ocular conjunctiva and upon the globe. The motility of the eye was slightly

¹ Read before the American Ophthalmological Society, at its Twenty-fifth Annual Meeting, New London, July 17, 1889.

interfered with upward and outward. The media and fundus were normal, and vision was $\frac{2}{20} +$. The ocular and palpebral conjunctiva was somewhat injected, but there was no secretion of any kind. A diagnosis was made of tumor of the lachrymal gland, and it was decided to attempt its removal. The patient was etherized, and the upper lid pulled downward as far as possible over the lower lid. The eyebrow was then closely shaved, and an incision was made from the middle of the eyebrow outward, following the line of the supra-orbital margin for the distance of an inch and a half, through the skin and subcutaneous tissue. The tarso-orbital fascia was then divided, care being taken not to wound the tendon of the levator palpebræ muscle. As soon as the orbital cavity was opened and some of the orbital fat pushed aside, the tumor was seen to involve the lachrymal gland. By the aid of the handle of the scalpel and a pair of blunt-pointed scissors the adhesions between the growth and the upper and outer walls of the orbit were carefully divided, no very firm points of adhesion being found. The attachments of the tumor to the eyeball were then easily separated, care being taken to dissect off as much of the ocular conjunctiva from the external face of the tumor as was possible, and the enlarged gland was then removed entire. There was considerable hemorrhage from the divided vessels, which, however, soon ceased, and the cavity was then washed out carefully with a solution of mercuric corrosive chloride (1-1,000). Six deep sutures were then introduced through the entire thickness of the lips of the wound, including the tarso-orbital fascia, and as many more through the external lips of the wound as were necessary to bring the edges into thorough coaptation. Sublimate dressings and a bandage were then applied. The wound healed by first intention, and there was no supuration, and in three weeks all signs of tumor or operation had disappeared. The tumor was hardened in Müller's fluid and alcohol, and numerous sections were made and carefully stained for future study. These showed

that the degeneration had begun near the centre of the gland, for here nearly all traces of the normal glandular structure were absent. It was impossible, however, to determine whether the abnormal growth began in the ependyma of the glandular tubules or in the connective tissue around them. If it be true, as Berlin thinks, that all adenoid tumors belong to the common type of cylindroma, then the tumor in question was a cylindroma. Away from the centre, and near the periphery of the gland, there were found many tubules in a healthy state, but even in the midst of these normal tubules were others in a distinct condition of hypertrophy, with numerous small round cells. In all parts of the growth, the connective-tissue framework was crowded with small round cells, and as the sections approached the centre of the gland these cells became more and more numerous, until all the glandular elements were crowded out and disappeared, and nothing was visible but a closely pressed mass of small round cells in place of glandular tissue. After a careful examination had been made of the various sections, the patient was told that the growth would in all probability return, and that he must report at intervals for examination. The tumor was removed in June, 1887, and the patient has been seen at intervals of two or three months ever since, the last time in March of this year. At this visit nothing abnormal was discovered in the orbit or eyelids. I have termed the growth an adeno-sarcoma of the lachrymal gland, as being most in consonance with the results of the microscopic examination.

CASE II. *Abscess of the Ethmoid Cells, Frontal Sinus, and Orbit.*—The patient, a gentleman, aged forty-six, consulted me on April 16, 1888, with the following history: He had been long subject to naso-pharyngeal catarrh, with frequent acute exacerbations and profuse discharge, and he had been under treatment of one kind or another for many years. About Christmas of 1887 he first noticed a swelling at the upper and inner angle of the right orbit, though he had had a constant dull pain in

this vicinity for more than a year. The swelling continued to slowly increase, without much change in the subjective symptoms, until March, when he began to see double. At this time his headache was constant, and being alarmed he consulted his family physician, who made an examination and discovered that with either eye alone his vision was perfect, but that the diplopia, and consequent disturbance of vision, returned when both eyes were open.

Tincture of iodine was painted over the swelling of the lid, and potassium iodide was given internally, but without producing any beneficial effect, and he was finally advised to consult me, which he did on April 16, 1888. I found a rather marked protrusion of the inner half of the right upper lid, and a dislocation of the right eye outward and downward, and a little forward. The motility of the eye inward and upward was somewhat limited. The lids were normal in action. Vision was $\frac{20}{20}+$, and the media, fundus, and field of vision were perfectly normal in every respect. The tumor or swelling was smooth, elastic, irregularly ovoid in shape, and extended backward some distance into the orbit. It occupied the supero-internal angle and inner wall of the orbit. It was painless on pressure, and showed no signs of any inflammatory process. There was a profuse, almost purulent, discharge from the right nostril. A hypodermic needle was introduced through the skin of the lid, and pus was withdrawn from the cavity. A diagnosis was made of abscess of the frontal sinus, which had probably broken through the bony roof of the orbit, and involved the latter cavity. The patient was told that nothing but operative interference would be of any use, and he consented at once to have the operation done. On April 18th the right eyebrow was shaved, and a long incision was made through all the tissues down to the bone, beginning at a point at the junction of the middle and outer thirds of the eyebrow, and running parallel to, and just above, the supra-orbital margin, across the root of the nose, to the inner end of

the eyebrow on the opposite side. As soon as the knife penetrated the region of the swelling it was followed by a flow of pus, amounting to about half an ounce, as nearly as could be calculated. As soon as the incision was completed the knife was withdrawn and the finger introduced. A large irregular hole was felt just at the inner end of the supra-orbital margin, extending into the frontal sinus, and involving part of the lachrymal bone. Pressure on the closed lids backward caused pus to run from the incision, and the finger pushed into the orbital cavity discovered that the abscess extended backward into the orbit, and that there was an opening in the orbital plate of the ethmoid bone large enough to admit the end of the middle finger. The walls of the frontal sinus were distended in all directions, and were rough and covered with numerous osteophytes; but the bony septum between the frontal sinuses did not appear to be perforated. The frontal sinus was first washed out with a sublimate solution (1-500), bringing away much pus and small particles of bone, and after a brief period the fluid was observed to drop from the right nostril, showing that a communication existed between the frontal sinus and the superior nasal meatus on this side. The same solution was then used to wash out the cavity of the abscess in the orbit, and also the ethmoid cells, and this also brought away a large quantity of pus. After the entire cavity had been cleansed thoroughly, a rubber drainage-tube was introduced into the frontal sinus, and the rest of the external wound kept open by pledgets of sublimated cotton, and the patient was made to lie on his right side. The lids were kept closed, and covered by a piece of gold-beater's skin, in order to prevent, as far as possible, any entrance of the purulent discharge into the conjunctival cul-de-sac. The cavity was washed out twice a day with the sublimate solution, until the discharge of pus grew very scanty, and then the irrigation was practised once a day until all purulent discharge had ceased. The drainage-tube was finally removed at the end of the third week,

at which time all external swelling of the surrounding parts had disappeared, the flow of pus was reduced to a few drops, the eyeball had returned to its normal position, and the diplopia had vanished. At the end of the third month the cavity in the orbit had closed, and shortly afterward the external wound along the orbital margin filled up with granulations, which first appeared from the edges of the opening into the frontal sinus, and gradually the external wound healed under a scab. At the end of the fourth month close observation was needed to discover that an operation had been performed. For about two months previously systematic treatment of the nasal cavities had been carried out, with the result of checking all discharge from the nostrils, and converting the patient from the state of a mouth-breather to a condition of normal respiration. The patient has not been troubled since. This is one of quite a number of cases operated upon in a similar manner, which have all recovered in a comparatively short time, and without any bad results.

CASE III. *Tumor of the Maxillary Antrum, Nasal Fossæ, Ethmoid Cells, Orbit, and Cranial Cavity; Operation for its removal; Death.*—The patient, James M——, aged fifty-one, first consulted me on November 11, 1887, and gave the following history: He had always been subject to profuse naso-pharyngeal catarrh, which had been treated in an intermittent and spasmodic manner for a number of years. In February, 1887, he began to suffer from shooting-pains in the left side of the nose, and along the course of the left supra-orbital and infra-orbital nerves, and as the weeks elapsed this pain increased in severity, and began to be localized in the left orbit. In April there appeared a profuse purulent discharge from the left nostril, and from the pharynx. The pain continued to increase in severity, and early in August the left eye began to protrude from the orbit. The ocular conjunctiva gradually became injected, and the eyelids, particularly the lower lid, became swollen. He at this time consulted Dr. E. G. Janeway, of New York,

who after a careful examination told him that he had a tumor in the left orbit. The symptoms gradually grew worse, and early in October the exophthalmus was so marked that he could scarcely close the lids over the eyeball, and his vision began to be impaired. On November 11th, when I first saw him, his condition was as follows: The left eye protruded forward, outward, and downward, and the lids could not be closed over it. The cornea was clear. The lower lid was everted and partially concealed beneath the protruding globe. The ocular conjunctiva was markedly congested and the chemosis very extensive. The eye was absolutely immovable. Vision was $\frac{20}{100}$, that of the other eye being normal. The ophthalmoscope showed a well-marked condition of "choked disc," with hemorrhages. A protrusion of the growth could be seen anteriorly at the inner angle of the orbit, and an examination with the finger demonstrated that the tumor could be felt at the inner canthus, and backward along the inner wall and floor of the orbit. A careful examination of the anterior and posterior nares showed that the left inferior nasal meatus was entirely occluded by a growth, and it was thought that the latter also extended into the middle nasal meatus. The occlusion of the inferior meatus was caused by the bones being pushed down from above by the growth, this being the opinion of both Drs. Lefferts and Asch, who kindly examined the case with me. The patient was then sent for a further examination to Dr. William T. Bull, of this city, who diagnosed a tumor of the antrum, nasal meatus, and orbit, and advised non-interference, by reason of the probability that the growth involved the deep bones of the face.

The pain was now so severe that the patient had to be kept constantly under the influence of opiates. By December 3d the eye had become entirely blind, and the protrusion forward of the growth was very marked. It was decided to attempt the partial removal of the tumor, as a means of affording the patient some relief from his

suffering. On December 5th the eye was enucleated, under ether, with considerable difficulty, and then complete exenteration of the contents of the orbit was begun. The conjunctiva was divided along the margin of the lids, and the entire contents of the orbit were removed by knife and scissors. The bony floor of the orbit was entirely absent as far back as the apex of the orbit, except a narrow rim along the anterior margin. The maxillary antrum was filled with the growth, and was entirely cleaned out with forceps and curette. The opening from the antrum into the nasal meatus was found enormously enlarged, and the left side of the nose was filled with the growth. Part of the lachrymal bone and the entire orbital plate of the ethmoid were gone, and the ethmoid cells were filled with the growth. There was a large ragged opening through the roof of the orbit into the anterior fossa of the skull, and through this the growth also extended into the cranial cavity. All operative procedures were then stopped, the cavities of the orbit, maxillary sinus, and nasal meatus were carefully washed out with a solution of mercuric bichloride (1-2,000), and antiseptic dressings applied. There was no unusual amount of blood lost during the operation. On recovering from the effects of the anæsthetic the patient complained of great pain in the head, which was relieved by morphia. He remained fairly comfortable until about 9.30 P.M. of December 6th, when his breathing suddenly became stertorous and he was found comatose. In a few minutes the respiration became Cheyne-Stokes in character, but this yielded to hypodermic injections of strychnine. The patient died quietly, in a comatose state, at 7 A.M. of December 7th, with regular respiration. Unfortunately no autopsy could be obtained.

The tumor was carefully hardened in Müller's fluid, for about two months, and numerous sections were then made through various parts of the growth, special care being devoted to the growth removed from the maxillary sinus. At first there was considerable difficulty experi-

enced in classifying the tumor, as the sections seemed to be made up of nothing but cells. Of these there were all kinds—round, ovoid, stellate, and fusiform—the small round cells largely predominating. There was a very scanty fibrillar, intercellular substance, and the general consistency of the growth at the time of its removal was decidedly soft or medullary. This was particularly true of the mass removed from the maxillary antrum. The growth in the orbit and ethmoid cells was decidedly myxosarcomatous in character, and a careful study of sections from all parts of the tumor finally led me to class it as a myxo-sarcoma. In some places, in both the orbital and maxillary growths, there were small cavities, filled in the fresh state with a yellowish fluid, which gave to the part the character of a cysto-sarcoma. In all probability the disease started in the maxillary antrum, possibly as the result of long-continued irritation and inflammation extending from the chronic naso-pharyngitis, and thence growing in every direction—inward to the middle and superior nasal meatus, and thence into the cavity of the ethmoid bone, and upward through the orbital plate of the maxillary bone into the orbit. The absorption of a part of the roof of the orbit, and the extension of the growth into the anterior fossa of the skull, was probably the latest stage of the disease. The direction of the growth inward would of course make the extension outward through the opening of the orbit a slow and protracted process, as was proved in this case, the exophthalmus having been one of the later symptoms. Still, it is the general opinion among surgeons that growths originating in cavities near the orbit, and involving the latter secondarily, are generally of very rapid growth. In the case in question all the subjective symptoms occurred within ten months of the death of the patient.

