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*Case of a Tumor, with remarks by J. P. BATCHELDER, M. D.*

THAT every operation in surgery should be based on the anatomy of the region which is the field of operative procedure is an axiom in the science which should never be held in light esteem by the operative surgeon; but it is of the gravest import when operations for the removal of tumors, whose relations involve parts essential to life, are about to be undertaken. The case of a tumor communicated by the writer to the profession, through the medium of the July No. of this Journal, was pre-eminently in point; and he would now with great deference submit another which may be deemed a counterpart to the former. A little girl, the daughter of Mr. Charles M—, of Boonville, in this State, about 7 years of age, had been for some time affected with a tumor situated in the right side of her neck, which commenced between two and three years before, under the ear, very like a common enlargement of the glands of that region.

At the time of the operation, September 16, 1841, it was somewhat larger than a pint bowl, and extended from and beneath the clavicle on the right side to the occiput and mastoid process of the temporal bone, and forward under the mastoid muscle to, and as we found in the operation, behind the trachea between it and the œsophagus, and backward between the trapezius and the levator scapulæ and scaleni muscles to the spinous processes of the third, fourth and fifth cervical vertebræ, depressing the right shoulder and pushing the head over upon the left. Anteriorly and inferiorly it was firmly bound down by the sterno-mastoid and omo-hyoid muscles; posteriorly by the clavico-cervical portion of the trapezius, and over all parts, by the superficial and deep fasciæ of the neck, which, although weak in so young a subject, contributed no doubt, with the above-mentioned muscles, to render the swelling firm and to such a degree fixed, as to make it exceedingly difficult to determine how far it was moveable, if indeed it were at all so. When all the parts were put in the state of the greatest relaxation, by grasping it with the hands, and as it were, pulling it outward, it was thought that a slight degree of backward and forward movement could be impressed upon it; but all attempts to move it longitudinally, *i. e.* in the direction of the muscles, were unavailing, except that by placing the fingers and thumbs above and below in the interstice between the sternocleido-mastoid and trapezius muscles, and applying considerable force, it did seem to be apparently moveable upward and downward, if the

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parts were relaxed, but if tense, little or no impression could be made upon it.\*

This being a tolerably good test, and perhaps the only true one for deciding the mobility of a tumor, much doubt existed as to the precise connection and mobility of the one under consideration; but from its being bound down so firmly by the fascia and muscles, and limited above by the head and below by the clavicle and shoulder, we hoped that its fixedness might not be quite absolute. No pulsation could be felt in any part of it, neither could that of the carotid or subclavian be perceived. As it was not affected by deglutition, it was inferred that it did not adhere to the trachea or larynx, and moreover it was hoped that it might lie anterior to the omo-hyoideus, and consequently not very intimately connected with the carotid and subclavian arteries; and this inference was rather corroborated by the fact that neither the motion nor sensation of the right arm or the pulse in the radial or temporal arteries was affected. If, however, this inference were just, how were we to account satisfactorily for the immobility of the tumor? The movements of the head and shoulder were restrained by the bulk of the tumor and tension of the muscles caused by it; but when either the head or the shoulder was moved backward or forward, the tumor did not appear to be carried along with them. In the interstice between the mastoid and trapezius it was slightly uneven; firm, but not hard. The character of that portion of the tumor which was covered by muscles could not be ascertained, and with the exception above mentioned it was almost entirely so covered, for in its growth it had pushed the sternal portion of the mastoid forward so as to leave scarcely any space between that muscle and the trachea, or between it and the sterno-hyoid and sterno-thyroid.

With reference to an operation, the nature of a tumor, and its connections and relations to surrounding parts, should be settled with as much accuracy as circumstances will admit. First then; What is the nature of the tumor; malignant or not? In the absence of well marked local phenomena which characterize malignity, the rapid enlargement of a tumor, not from excitement or irritation; or constitutional affection associated with one either slow or rapid in its progress, and particularly the latter (constitutional affection), may be considered as indicative of a grave and probably malignant disease; but in the case before us, the chylopoietic viscera are and have been all along in a very tolerable condition, and the constitution, although somewhat affected, did not appear to be so beyond what might be fairly attributed to the size and inconvenience of the tumor; certainly not to a degree commensurate with what might have been expected from a malignant disease of such magnitude,

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\* A tumor, when connected with muscles, can be moved laterally, or at right angles with them, even when they are made tense, and I have known surgeons relying upon this test alone, to be deceived in regard to the mobility of a tumor, when the mistake might have been prevented, had the muscles been put upon the stretch, and the attempt to move it in the direction of their fibres been properly made. By omitting to follow this method mistakes have been committed in regard to the mobility of scirrhus mammæ, and unfortunate they are, for adhesion to the pectoral muscle is a circumstance which, if it do not absolutely forbid, at least throws great doubt over the propriety of an operation. When that contingency exists, I believe the disease always returns; such have been the teachings of my own experience and observation. The operation may indeed prolong the patient's life, but after all it will be but very nicely balancing between two evils.

and of so long standing. We were therefore inclined to the opinion that it did not belong to that class. From the slight inequalities observed in the space between the mastoid and trapezins, the tuberculated sarcoma of Abernethy suggested itself to our minds; but as there were no other tumors of any description to be found, that suggestion was not entertained. Medullary sarcoma was also mentioned, but not taken into the account. It particularly lacked that feel of fluctuation which is so peculiar to that sort of malignant tumor, and which is so apt to deceive the surgeon, especially if he be not one of considerable experience in such cases. Was it a strumous enlargement of the lymphatic glands of the neck? Its location at the commencement; the red flaxen hair, delicate skin and fair complexion of the child seemed to favor that idea; opposed to that view, however, it was considered that there was no affection of the eyes or ears; no tumefaction of the upper lip or abdomen; no articular disease, no irritation of the mucous membranes; none of that flabby softness of the muscles so characteristic of scrofula; no hereditary taint; no tumor in any other part of the body; no change of color, tenderness, pain or signs of suppuration in the tumor itself; that she had resisted the ordinary causes of indisposition, and enjoyed as good health as children in general; that struma in children is never confined to one part; for these considerations, the supposition that it might be a strumous affection was dismissed. If it were not strumous or malignant, was it adipose sarcoma? To this opinion we were inclined, as the most probable. No diagnosis with which we were satisfied was made out; to be honest we did not know what it was. That it would kill the child if not removed, was a conclusion in which all concurred; therefore, the next question involved the propriety of an operation, which must of necessity be protracted and severe, and considering the location and size of the tumor, and the tender age of the patient, extremely hazardous; but by taking time and giving frequent respites from suffering, the conclusion was that she would not sink under it, and as such subjects, if they do not succumb beneath the shock, generally recover, we were in favor of proposing the operation, and after stating all the contingencies, let the parents and friends decide; these decided in the affirmative; the little patient herself, who was very intelligent, also desired it.

#### *Operation.*

The parts to be more particularly regarded in the operation, were the carotid artery, internal jugular vein, trachea, œsophagus, and thyroids:—inferiorly; the subclavian, supra-scapular, transversalis colli and nerves in the supra clavicular region.\* The probable situation of the tumor, behind the deep cervical fascia, and consequently in contact with all these important parts, or only separated from them by a layer of condensed cellular membrane, greatly enhanced the difficulty and danger of the operation. The patient, wrapped round and round in a piece of cloth, which was pinned so as to confine her arms and legs, was laid upon the table upon her left side.† An incision was made through the integuments extending from the clavicle, a little in advance of the inser-

\* The deep fascia, in all its relations and connections with the tumor and other parts, was contemplated with the most anxious attention.

† In operations upon children, I am in the habit of resorting to the above described method of confining their limbs. If well and properly done, it makes the body and limbs all one piece, and gives us a perfect control over even a lusty boy.

tion of the trapezius, near to the point of the mastoid process.\* The middle of this cut was curved backward to the anterior edge of the trapezius. The original plan was to expose the tumor by a crucial incision; the longitudinal cut being crossed by another running from the spinous process of the fourth cervical vertebra to the trachea, dividing the cervical portion of the trapezius, and the mastoid and omo-hyoid muscles; the divided extremities of which, with the deep fascia, were to be dissected back from the tumor, the anterior surface of which was to be thus exposed. The posterior limb of the transverse incision was dispensed with, and the curve in the longitudinal substituted. As the vessels which supplied the tumor with blood, might be derived from the occipital, superior, and perhaps from the inferior thyroid, and also from the supra-scapular, it was designed, in that plan, to commence the dissection for detaching the tumor on its upper side, and carry it round on its inner, lower, and lastly posterior sides. This part of the plan was in accordance with a rule of surgery laid down in a former communication to this journal, to which I would refer the reader. As the vessels in children are small, the rule is of less importance in them than in adults, and in this operation it was not adhered to. The subjacent fascia was then opened and divided, by cutting from within, a director being passed beneath it. The surface of the tumor thus exposed, exhibited a tuberculated appearance. Although the tubercles themselves seemed each to be enclosed in a very delicate membrane of its own, yet the tumor, as a whole, had no envelope except what was formed by the condensation of cellular membrane caused by the growth and consequent pressure of the tumor. In some places this general envelope was more distinctly marked than in others; and there it enabled us to discriminate and separate with facility the morbid from the sound parts. The cut edge of that portion of the deep fascia which extends under the trapezius backward to the ligamentum nuchæ and spinous processes of the cervical vertebrae was raised, and the handle of the scalpel insinuated between the fascia and tumor, and forced upward, and downward, and backward, by which means room was readily made for the introduction of a finger, and also the curved spatula, by which the fascia and tumor were drawn asunder. The handle of the knife was again introduced, and the cellular substance pushed before it until it accumulated, and became so condensed as to resist the progress of the instrument, when the accumulated bands, thus firm and resistant, were severed close to the tumor by the edge of the knife. The tumor was thus separated from the fascia beneath the trapezius, and from the ligamentum nuchæ, and spinous processes, and drawn forward. In detaching it from the transverse processes, which could now be readily felt, care was taken to avoid the superficial cervical artery, which runs near those processes. Although that vessel must

\* This incision was made as follows: A transverse fold of integuments was pinched up and divided with a bistoury passed through it and its adherent side, and brought out at its duplicature. The fold on each side being released from the grasp of the fingers, the incision was extended above and below to the points mentioned. This method of cutting from within outwards, has, especially in children and timid people, much to commend it to the consideration of the surgeon. It gives less pain; is more rapidly and precisely executed, and furnishes the landmarks by which subsequent incisions may be made, and regulated, and prevents the necessity of repeated touches of the knife, every one of which gives almost as much pain as the original cut. I took the hint from Dessault, and have practised upon it as much as possible, through the whole of my professional career.

be very small in such a child, yet the caution was deemed not unnecessary, as a bleeding from even a minute artery in that place might be troublesome and difficult to arrest; therefore the tumor was pulled from its bed, and the fingers thrust beneath it and brought round, while the handle of the knife was employed in pushing the cellular substance away from it (the tumor), by which it was detached from that part without hemorrhage. As has been stated, the original plan was to commence dissecting on the upper, anterior and lower sides of the tumor, where it was supposed we should find the vessels that supplied it with blood; but from the nature of the tumor, it was obvious that no blood would strain through it; that part of the plan was therefore also abandoned, and the operation commenced and carried on as described, until the posterior half of the tumor was separated from the surrounding parts.

The separation was continued from behind forward, and the tumor drawn up as far as possible from the clavicle and the blood-vessels and nerves in that region. While the tumor was pulled and held away from them, the handle of the knife was continually employed in pushing them and the cellular substance away from it (the tumor), and also in being passed along its surface, until its progress was arrested by the accumulation of cellular bands, which were then divided as before described. By thus dissecting from behind forward, and from below upward, the tumor was considerably loosened, but not enough to be drawn out as we had hoped it might be from behind the omo-hyoid and mastoid muscles, which were therefore divided in the following manner: The handle of the knife forced in between the tumor and the deep fascia, which lay betwixt it and those muscles, made room for the introduction of the finger for the purpose of exploring the parts; and as no vessel of importance could be felt, the bistoury was introduced, and the muscles and fascia incised, and their divided extremities dissected up from the tumor, which exposed a considerable portion of its anterior surface. In this stage the curved spatulas were found very useful in holding back the muscles and trachea, away from which the tumor was at the same time drawn and held. In this position of the parts, the cellular substance was detached, and pushed away from the tumor with the handle of the knife; the finger was also introduced, and carried along in one direction or another, pushing before it portions of the connecting medium, until it accumulated so as to stop its further progress, when it was divided with the knife as near the diseased part as possible. By pushing the circumjacent tissues from the tumor, the connecting bands and vessels were so attenuated as mostly to give way to the pressure of the handle of the knife; such as did not were cut near the tumor, and consequently at a considerable distance from their origin, by which means all were reduced to the state of lacerated or insulated vessels which do not bleed.\* In this manner the dissection was carried on to the trachea and larynx, from the side of which, and from behind and between them and the œsophagus,† the anterior edge of the tumor was

\* Upon this simple principle of insulation may be explained the phenomenon that large arteries, as the axillary and femoral, do not bleed when the limbs to which they belong have been torn away by machinery.

† This interposition of a portion of the tumor, between the trachea and œsophagus, explained an unusual prominence of the trachea and larynx, which was noticed, but which, as there was no particular difficulty of swallowing, was not regarded, as it ought to have been, when settling the relations of the tumor. No particular inference was drawn from it.

separated with less difficulty than could have been anticipated, owing to a special arrangement of the deep cervical fascia in this part, which passes directly from the trachea to the œsophagus, without dipping into the space between them, which is somewhat triangular (the fascia, trachea and œsophagus, forming the three sides), and is filled with adipose matter. This disposition of the fascia, moreover, secured the inferior laryngical nerve which passes up between the trachea and œsophagus to the larynx.\* The dissection was pursued in this way until the tumor was wholly insulated, detached and removed. Recognizing in it a morbid structure (the tuberculated sarcoma of Abernethy), which was apt to return, great care was taken to remove everything of a doubtful character which could be suspected as making a part and parcel of the diseased mass, and this part of the task was rendered extremely difficult by the resemblance which some parts of the tumor bore to common fat. In this, however, we were assisted as has been suggested by the lobules being each enclosed in an envelope of its own, and bound together by very firm whitish bands.† The difficulty alluded to, rendered the operation much more tedious and protracted than it would otherwise have been. After the removal of the tumor,‡ while searching the cavity to ascertain whether any portions of it had been left, we discovered the common carotid and internal jugular vein, the subclavian artery, and the nerves going to the axilla, in a frightful state of nudity, and right glad were we to get out of a field of action with the tumor as a trophy, in which we had had so many hair-breadth escapes, that even curiosity lingered not to look for parts of minor importance, which we had never desired to see, although they had been the subjects of much anxious consideration. Notwithstanding the little patient had been on the table an hour or more, less than half of it had been consumed in the operation proper, frequent opportunities being given her to rest. Once it was suspended for some time, in consequence of an apprehension that she was actually sinking; by taking stimuli she revived, and the opera-

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\* Many years before, the writer dissected out a tumor, one limb of which, nearly half an inch thick, and an inch and a quarter or half broad, had passed flatwise through the interstice between the trachea and œsophagus, and showed itself more than half an inch on the opposite side. It had been very gradual in its growth, and lay in a sort of sheath or cyst (itself encysted), formed by pushing this fascia before it; from which it was rather easily turned out. It had considerable firmness, and occasioned, particularly at times, much difficulty of breathing and swallowing, especially the former; but on the whole, less than might have been supposed, owing to the slowness of its growth. It is well for every surgeon to make himself familiar with this arrangement of the fascia, for it will give him much additional boldness in attacking tumors in those parts.

† The tubercles composing the morbid mass were connected so as to form one common body, by the membranes that enveloped each, furnishing a band which extended to a morbid structure, fibrous, firm, dense and white, which formed a bond of union to the whole congeries. By the color and firmness of these bands, we were enabled to discriminate between the tubercles and the adipose matter, which they very much resembled. Whether this dense, firm, white connecting medium furnishes a distinctive pathognomonic mark, by which tuberculated sarcoma may be diagnosed, I cannot say, not having had sufficient experience to warrant the conclusion; generally considered, however, white bands in morbid structures are but too surely indicative of malignity.

‡ For the sake of convenience, the tumor has been spoken of as a whole, but it should be understood that it was tuberculated, and that the description of the operation has all along a more special reference to each lobule or tubercle of much size, situated on the periphery of the morbid mass.

tion was resumed and completed. The fortitude with which she bore this appalling operation was truly womanly and wonderful. The wound was dressed in the ordinary way, and healed almost entirely by the first intention. I regret to be obliged to say that the disease returned and destroyed the patient. A letter dated Boonville, July 14, 1846, from Ralph Lord, M.D., who was her attending physician, states, "that some six months after the operation, the scrofulous diathesis seemed to develop itself more fully and rapidly; other glands commenced enlarging, and from the nest where you cut out the first tumor, another sprung up and grew rapidly until it occupied the whole side of the neck, from the median line in front to the median line in the back of the neck, and from the ear to the joint of the shoulder. It soon became indurated, inflamed; the surface taking on a dark livid hue; finally, about a year ago, it broke out and commenced discharging, and soon ran her life away." Due caution was observed to prevent the admission of air into the veins.

By operating as above described, I have great confidence in the opinion that almost any morbid structure of a distinct organization may be removed by operation with safety, from nearly every part of the body, except the great cavities, provided the surgeon is cool, collected and deliberate, and withal perfectly acquainted with the anatomy of the part or region. Although the plan of an operation is seldom strictly adhered to in its performance, still I cannot help thinking that it is important for the surgeon to have one that is well digested in his own mind at least, if not written out for his guidance in such as are difficult and dangerous. He must, it is true, be governed by circumstances; still a plan will give him a boldness and promptitude in execution which few can possess without it. It is truly distressing to see a surgeon operating without such preparation. He cuts a little here and a little there; pulls this, and pulls that, and finally gets involved in perplexities and difficulties which he did not anticipate, and from which he knows not how to extricate himself, until at last, in desperation, he either commits a disastrous blunder, or abandons his job not finished, or but half done. Poor patient! unhappy surgeon!!

Drs. Lord and McVicker, Potter and George H. Batchelder, assisted in the operation.

84 Chambers Street, New York, August 6, 1846.

