HISTORY
OF
A TUMOR
SUCCESSFULLY REMOVED
FROM THE
FACE AND NECK,
BY PREVIOUSLY
TYING THE CAROTID ARTERY.
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COMMUNICATED BY
MR. ABERNETHY.

Read Feb. 6, 1816.

THE carotid arteries furnish so large a portion of the blood transmitted to the brain, that practitioners have been till very lately deterred from securing them by ligature, lest the functions of that important organ should be so much impaired as to destroy life. Mr. Abernethy was the first who tied the left carotid, which he did in a man who had the internal, and many branches of the external artery, divided by the horn of a cow. The patient lived only thirty hours, and died from the functions of the brain being injured.

This operation was, therefore, so little encouraging, as to be justifiable only where death must otherwise be inevitable ; since that period, the carotid has been tied by Mr. A. Cooper, and by Mr. Travers ; but I believe there is no instance on record, of its being secured by ligature, in order to render the removal of a tumor practicable ; the following instance of its successful adoption will therefore, I hope, be worthy the acceptance of the Society.

On Thursday, August 31st, I was desired to visit Mrs. Kershaw, of Middleton, a thin, middle-aged woman, upon whose case a consultation had been held the preceding day, at Manchester ; the general result of which was, that no operation was advisable. She had a large tumor extending from near the external canthus of the left eye, down the cheek to the infra-orbitary foramen and the root of the ear, which was elevated by the tumor, and, passing under it, it extended behind the mastoid process. Anteriorly, it extended to the chin, and to the trachea, which it partially covered, and hung pendulous over the clavicle. The circumference of the base of the tumor, when last measured, was twenty inches, since which period it had increased rapidly, but I regret not having ascertained its exact size ; it must, however, from the space it occupied, have been at least twenty-eight inches.

In the upper portion, comprized between the

cornu of the os hyoides upwards to above the zygoma; the tumor in the base was as large as, or larger than in its middle or apex, but below this point, its attachment to the neck was less extensive; and though hanging pendulous over the clavicle, its lowest connection with the neck was three quarters of an inch distant from that bone. On elevating the tumor in this lower space with a hand on each side, and passing the fingers at the same time under it, it might clearly be ascertained that there was no connection with the vessels; but as it hung over the trachea, and was connected with it, it required a very careful examination to be convinced that they were not united. The cornu of the os hyoides was however moveable under the tumor, and independent of it; respiration was tolerably free, when in an erect posture, and on passing the fingers forcibly between these parts, I was pretty well convinced that they might be separated. The œsophagus here was too deep to be implicated in the disease.

Above the cornu of the hyoid bone, the base of the tumor was very extensive, and deep, impeding deglutition considerably. On directing the finger, passed into the mouth, towards the base of the ramus and angle of the maxillary bone, and into the fauces; the intervening substance appeared considerable, and authorized an opinion that the fauces would not be cut into, nor indeed exposed, by its removal. The submaxillary gland was press-

ed inwards, but did not appear enlarged or hardened, and the membrane of the cheek was also healthy, though the tumor appeared in contact with it.

The disease commenced behind the angle of the jaw, and now extended beyond the mastoid process, and was so closely connected with the subjacent parts, that the finger could not be passed under it. Its connections here, therefore, were only to be ascertained by collateral circumstances; and as the whole site of the parotid gland was covered by it, it became a question worthy of serious consideration, how far that substance was enveloped in the disease, particularly as it had been stated on most respectable authority, that its removal was impracticable. The patient's being able to open the mouth and masticate, was a complete proof, that if the whole substance of the gland were diseased, it had become dragged from its situation by the weight of the tumor, and that the tumor itself did not dip into the fossa behind it. Yet every other circumstance rendered it certain that the parotid gland was enveloped in the disease, which was indeed verified in the operation. But the extent of the disease here became of less importance if the carotid artery were previously secured, as I intended. I ought to have observed, that the tumor was perfectly moveable, though its motions were very limited, and that it had,

therefore, no bony attachment either to the jaw or to the zygoma.

The surface of the tumor was divided into large tubercles, and the apex of each tubercle was rendered more prominent by a collection of fluid : it was fleshy, but had neither the hardness nor any other external character of carcinoma. There was no absorbent gland affected in its neighbourhood, and though ulcerated in two points, one of which was extensive, the aspect of the ulcer was not forbidding, being partially granulating and partly sloughing. Fungus hæmatodes was therefore not to be dreaded. Yet a discouraging circumstance arose from a Charlatan's having, as he believed, succeeded in removing the complaint by the knife, at an early period of its history, on which occasion the hæmorrhage was very alarming. After a short time, the disease reappeared, and had only been nine months in attaining its present enormous size. Large varicose veins spread over the surface, and as the skin was uniformly diseased, ulceration might be expected to extend to them, and hæmorrhage to be an inevitable consequence.

The woman's health was tolerable, though her strength was reduced; and the weight of the tumor, which she generally rested on the shoulder, prevented her from using exercise. She had applied to many practitioners, and to a neighbouring infirm-

ary ; but the result had uniformly been unfavourable to her wishes. The consultation which I have mentioned, was called by my friend Mr. Killer, to whom, at the recommendation of a practitioner in the neighbourhood, she had applied as a last resource, and nothing discouraged at the result of it, she was resolutely determined to have the tumor removed, if any one would second her noble resolution by making the attempt.

The objections to the operation were twofold, and depended on the hæmorrhage threatening immediately to destroy the patient ; or, this being removed, on the disease being reproduced. The former objection was obviated by tying the carotid artery, and there was no doubt of the disease being removable except at the part I have mentioned ; and as it was agreed by all the consultants that her death was otherwise inevitable, and must soon take place, there appeared at least a chance of her being saved, and however small that chance, I considered a surgeon justifiable in seizing it. The question then turned on the propriety of tying the carotid artery. I had a firm conviction that in both Mr. A. Cooper's cases the patient died* ; and this conviction was so strong that I did not refer to them. But though this had been the fact, no surgeon would hesitate in cases of aneurism, to give his patient the small chance of recovery which an operation offered, after the encouragement, which the

* One of these patients recovered.

insulated instance, as I believed, of success in Mr. Travers's case, afforded, rather than suffer him to die inevitably by the progress of the disease ; and if we consider the causes of death, it will appear that none of these causes would be enhanced by the peculiarities of the present case, and the additional operation. The chance of irritation in the trachea, œsophagus, &c. producing cough, and destroying adhesion in the vessel ; or in the par vagum, disordering the stomach, was equal in either case ; but the danger most to be apprehended from hæmorrhage was less considerable than in aneurism, from the artery being almost certainly healthy. If inflammatory symptoms supervened, they were also likely to be relieved by the discharge of a large suppurating sore ; and the loss of blood during the operation, though considerable, would be in this respect advantageous and desirable.

Another consideration was the power of restoration, for the skin covering the tumor was diseased ; a large suppurating surface must therefore be exposed and filled by granulations. It was not certain that sufficient power would remain in the part for these operations, especially as the sources from whence they must proceed, were previously weakened by disease. But having expressed my willingness to encounter these difficulties, the woman was importunate for the attempt ; and as an alarming hæmorrhage supervened on the third day after my visit, her life could not be materially shortened, and

no time ought to be lost. I, therefore, with the consent of Mr. Killer, who had obligingly offered me his assistance, appointed Tuesday, September the 5th, to meet my friends at Middleton, for that purpose. I was disappointed in not having Mr. Killer's valuable assistance, but his place was kindly supplied by my ingenious friend Mr. Jordan, of Manchester, who with accurate anatomical knowledge combines great coolness and dexterity; and in the presence of Messrs. Brigham, Woodcock, Morris, Bingham, and several other gentlemen, the operation was performed in the following manner: the patient being previously laid upon a table, with her head as low as she could bear, from the danger of suffocation by the pressure of the tumor.

An incision about four inches in length was made through the integuments, from the points A B*, and the tumor at the same time brought as much as possible from over the trachea, to reach the edge of the sterno-mastoid muscle; the course of which could not previously be traced, the sternal edge of its tendinous insertion being only just perceptible; blood followed the incision very profusely, but having dissected the sac of the tumor from the neighbouring integument, the inner edge of the muscle came into view, and the platysma myoides being more freely divided, the artery was plainly felt beating at the bottom of the wound. The knife

* See plate I.

was now laid aside, the cellular membrane separated by the fingers, the arterial sheath exposed, and the vessels secured between the finger and thumb : I endeavoured to separate the fibres of the fascia by the nails of the fore-finger and thumb, so as to pass the finger beneath the artery, and by its constant apposition with the vessel, prevent any other part from being included. The resistance to this attempt was great, and the eyed end of a probe which I had formerly found useful, was directed to the outside of the vessel, so as to press against the finger on the opposite side ; but though bent at different angles to accommodate it to the wound, the shaft of the strongest probe was too slender to be directed with accuracy to so great a depth, and generally turned in the wound. The size of the tumor very much added to the difficulties of this stage of the operation, not only by rendering the wound deeper, but as it was necessary to keep it aside, and this necessarily impeded the fingers ; whilst, if left at liberty, by pressing upon the probe, it changed its direction. The point of an aneurismal needle was next tried with no better success, but on directing the shaft of the needle into the wound, it was pressed against the finger with great facility, and when convinced that no part intervened, for the vessel had been stripped of its fascia, except at its posterior part, where on insinuating it between the thumb and finger, passed on each side, only a few fibres were left undivided, and the division of these being accomplished, the finger was gradually and

cautiously passed under the vessel, with the needle in contact with it, passed from without inwards. But it had to be turned, which in so deep a wound was with difficulty accomplished ; and though the greatest care was observed by keeping the finger of the left hand between the end of the instrument and the trachea, and pressing at the extremities of the instrument to bend and accommodate it to the cavity, more violence was done to the vessel than was desirable.

The patient bore this tedious operation with great fortitude, only endeavouring to relieve the irritation which the fingers produced, by a frequent attempt to swallow. A considerable quantity of blood was already lost, and the ligature was therefore immediately tied as low as possible in the wound. She complained of much pain, when the thread was drawn tight, extending from the wound to the whole of that side of the head.

The fluid contained in the apex of each tubercle was next discharged to reduce the size of the tumor, and render it more easily handled, as well as to lessen the pressure on the trachea, of which the patient complained heavily. The incision being then carried along the base of the tumor to its upper part, it was dissected from the cheek ; though during this, and the remaining part of the operation, the fingers were used wherever practicable ; but occasionally stronger ligamentous bands ren-

dered division by the knife necessary. The hæmorrhage, on dividing the integument, which connected the upper portion of the tumor to the head, where the external veins were ramified over it, was considerable, and on dissecting downwards the ramus of the jaw became cognizable; and in this part, as well as under and behind the ear, each stroke of the knife was followed by a gush of blood, and occasionally in a tremendous stream, which, after continuing for a few seconds, ceased. The patient was very faint when the operation was finished, but a little wine at intervals soon restored her to complete perception.

Besides a general oozing, there were a few points from which blood flowed rather freely, though the blood was venous; and as a matter of caution rather than of necessity, they were secured by ligature. The wound now exhibited the following appearances: the whole sterno-mastoid muscle was exposed, and its fibres dissected clean, except about half an inch from its insertion into the clavicle. The wound extended backwards from behind the mastoid process, to the trachea anteriorly, but became narrowed in the direction of the muscle at the lower part of the neck. The submaxillary gland was exposed, and about one fifth of its substance, not appearing healthy, was removed. The digastric and the greater portion of the milo-hyoideus were exposed, the ramus of the jaw was only covered by periosteum, except where covered

by the masseter muscle, part of which, not appearing healthy, was dissected away; the whole of the condyloid process of that bone was laid bare in the same manner, and behind it the pterygoid muscles were also exposed. The membrane of the cheek was only covered by a cellular substance, which did not appear healthy; but sufficient skin was saved to cover the zygoma. The parotid gland was entirely removed.

After cleansing the wound, the skin wrapped over as much as possible, was secured by adhesive plaster, covered with a pledget of lint spread with cerate. The patient expressed herself comfortable, though very faint; and the table being brought to the bed-side, she was lifted into it. Her pulse was 110 and very weak.

11, *p. m.* She is very comfortable, except from thirst, and soreness in the throat, which impedes swallowing. Her pulse is risen, though not less frequent. She has made water freely.

Wednesday, 9, *a. m.* (second day.) She was troubled with thirst till midnight, but afterwards slept comfortably; the soreness in the throat is abated, though on swallowing it is perceptible. At four, *a. m.* she perspired copiously, and her skin is now moist. Pulse 108 and soft: she has passed urine freely; no discharge from the bowels, but she had three motions yesterday previous to the operation,

There is a copious secretion of tough mucus from the trachea, no headache or sickness, and the wound is easy. A general oozing of blood has stained the dressings.

9, *p. m.* Pulse 120, skin rather hot and dry; occasional pulsation in the head; no thirst. Discharge of bloody serum from the wound continues. To have an opiate if restless; and an enema early in the morning if the bowels have not been opened.

Thursday, 9, *a. m.* (third day.) The patient has had a good night without the opiate, having scarcely awoke. Her pulse is now 106 and soft, no pain in the wound, though the face is somewhat swollen. She had a shivering in the night which was immediately removed by warm covering, but succeeded by considerable heat.

In addition to the soreness of the throat, she has a trifling cough, which gives no pain. The enema procured three large motions of a good colour and consistence; she makes water freely; and has taken tea and gruel comfortably, but in small quantities.

9, *p. m.* The pulse is again risen to 120 and full. She complains also of some headache, and the throbbing extends down the face; her bowels have not been again moved. She has neither thirst nor heat. The oozing of blood appears to have

ceased, and the soreness in the œsophagus and secretion of mucus are somewhat moderated. Her head and neck have been kept moist with tepid water, and she is directed to take one of the following powders every four hours.

R. Hydrarg: submuriat: grs. vj.

Pulveris: Antimonial: grs. xvj. M. et divide in chart: vj.

Friday, 9, *a. m.* (fourth day.) I found her with her skin cool and moist, pulse 100 and soft. She passed the night comfortably, the beating in her head is less troublesome, and is perhaps of little consequence, as she is subject to it. The wound discharges copiously, which will relieve any determination to the head. Her bowels have been again opened this morning. She has still tenderness on swallowing, and a considerable flow of mucus; but her cough, which has been very trifling, has left her.

Friday evening, 8, *p. m.* Pulse 104, but possesses a peculiar vibrating feel, her head is easy, she has no heat, little thirst, and is without cough. The mucous secretion does not increase, though the soreness is extended to the root of the tongue. The catamenia, which had begun to flow this morning, have ceased. Her bowels have been again opened. If the headache return, or the soreness in the

throat increase, let an enema be injected. To continue her powders, and to take milk freely.

Saturday, 9, *a. m.* (fifth day.) Pulse 104 and soft; there is neither thirst nor headache complained of; the skin is cool.

The pain on deglutition, and the ptyalism as usual; but the former is complained of chiefly after sleep. The night was passed comfortably.

The dressings were removed, and the following appearances were noted down. The wound is very extensive, and covered in its upper portion with a dark-coloured mucous matter, which adheres to it. There is also some dark-coloured coagulated blood oozing from several points. The lower half of the wound is not at all granulating, but of a palish ash colour, and the skin in some parts of its edge vesicatory. The discharge is considerable and watery.

Dry lint was applied, and the patient was ordered to take wine or porter in small quantities, in addition to her milk and broth.

R. Decoct: cinchonæ lancif: f. ʒvij.

Tinct: cinch. Comp: f. ʒss.

Acid: Sulph: dilut: f. ʒj.

Tinct: Opii *m* XL M. Capiat cochl. ij.
quartâ quâque horâ.

Vespere.—Skin cool, pulse 100. She has taken broth, milk, &c. and a small quantity of wine; but the pulse having risen it has been omitted. The bowels have not been moved since this morning's visit; a purging powder was therefore given, and the bark and wine discontinued till the bowels are opened.

Sunday, 10, *a. m.* (sixth day.) Pulse 98 and soft, the skin cool, no headache or thirst, and the difficulty in swallowing abated. About three o'clock she awoke from a dream, and was much agitated; her pulse was then very quick, and the throbbing in the head very violent, with acute pain; but in half an hour she again slept, and passed the remainder of the night comfortably. There is some sensation in the cheek, and the warmth has been always natural. Her bowels have not been opened.

The upper surface of the wound is sloughy, the lower part granulating, but the granulations are very pale. A slough also lines the orifice, which passes to the artery.

Monday, 10, *a. m.* (seventh day.) The patient has passed a good night, the pulse is 100 and soft, and she is free from thirst or fever. Her appetite is good, and she takes plentifully of milk, pottage, and broth. A motion was yesterday procured by an enema, she had another this morning. The secretion of mucus and the pain on swallowing are

abated. There is some deficiency of saliva, the mouth being generally dry after sleeping. The discharge is partly puriform, but there is a very copious flow of saliva from the submaxillary gland. The slough is thinner, having here and there points of granulation rising through it, in one place the size of a sixpence. In the neck the granulations are pale, but there is a disposition to cicatrize on the posterior edge, where the mastoid muscle passes. The pulsation in the right carotid extends to the left side, and that of the left subclavian seems to be communicated to the vessel which has been tied, and excites suspicions of its being still pervious.

Tuesday, 9, *a. m.* (eighth day.) The sloughs continue to separate, and the granulating surface is less pale. The discharge is copious, and from the neck puriform. There is also some discharge from the orifice through which the ligature passes to the artery, but it is very healthy, and the slough lining it has separated. The last ligature on the small vessels also came away this morning. The patient passed a good night, and her strength increases.

Wednesday. She was restless till one *a. m.* but her bowels were then moved, and she afterwards slept comfortably, yet is not so well this morning. Her pulse 110 and irritable. Her appetite fails, having a dislike to any thing but gruel; yet her

tongue is clean, her skin moist, her bowels have been again opened, and the discharge is natural. She had yesterday some throbbing near the ligature, but to-day the wound is easy. The ulcer on the neck contracts rapidly, the granulations, though pale, being healthy; but in the upper part, covering the cheek, the surface is glassy and irritable, with streaks of vessels running over it. The sloughs are mostly separated, except one, the size of a shilling, below the ear; and another in the deepest part of the wound, at the lower edge of the sub-maxillary gland. The flow of saliva from this part is very great; below it, the discharge is healthy, but upon the cheek glutinous. A very little healthy looking pus may be pressed out of the orifice through which the ligature passes, but the granulations are rapidly closing around it, and it is now a mere fistulous opening. Dry lint was applied to absorb the moisture, and over it adhesive plaisters.

I visited her again this evening, and found her pulse 104 and softer. The perspirations have been considerable, and the bowels again move naturally. She was directed to eat ripe fruit, and omit the wine.

Thursday (the tenth day). The following report was collected at this morning's visit. The patient passed a good night,—her appetite is returned, and her pulse early this morning 94. The wound looks

much better, and contracts rapidly ; the upper portion beginning to heal, particularly near the ear.

Friday (eleventh day). Much as yesterday, in all respects going on well. The pulse 102. She has been allowed to sit up, the last three days takes food well, her bowels regular and the discharge puriform. The ligature has risen considerably out of the wound.

Saturday (twelfth day). The ligature came away this morning, without the smallest hæmorrhage ; her pulse is 92 and soft. She slept well after midnight ; her appetite is excellent, bowels regular, and the wound healing rapidly.

Sunday (thirteenth day). Much as yesterday, pulse 92. She sat up an hour yesterday without fatigue, and slept well.

Tuesday (fifteenth day). The pulse yesterday morning, in consequence of being agitated, 108 and irregular ; to-day it is only 82, soft and regular. The patient improves progressively, but the granulations rise above the surface, and there has been a large secretion of saliva : the surface was therefore occasionally washed with a solution of the nitrate of silver, which has repressed both these inconveniences. The wound leading to the artery is entirely filled up. The general health is good,

and on the seventeenth day after the operation, she sat up three hours without fatigue.

It is unnecessary to occupy the time of the Society by a further detail of her advancement towards a complete recovery. In ten weeks the wound was healed ; but the granulations were never florid or pointed, and the secretion of saliva was long considerable, though it did not appear to retard the cicatrization of the ulcer. There has been no symptom of a return of this formidable tumor.

I cannot close my account without calling the attention of the Society to the improvement which this branch of surgery is likely to derive from this operation ; for the extirpation of any tumor behind the jaw, which is not connected deeper than the muscles attached to the styloid process, may with safety be removed by it, and very few instances of disease here have a deeper origin. The surgeon cannot however be too cautious, that neither the larynx nor pharynx are attached to it.

I know of no case, where the disease was at all comparable in extent, with a similar result. The rapidity of the growth of the tumor shews its extreme vascularity, and the flow of blood was so considerable, even with the carotid tied, as to convince me, if the subject had previously admitted of a

doubt, that the most dextrous operator could not have completed it without that preparatory step *. It was not merely the security which was thus afforded to the operator, but the chance of the tumor being reproduced was also lessened ; for if any portion of the diseased structure escaped observation, by cutting off so directly the flow of blood, there was great reason to conclude it would die from mere exposure. I hailed the sloughing surface, therefore, as a favourable circumstance, whilst it did not extend too deep ; for there could be no hesitation in attributing it to the right cause, as the constitutional symptoms were mild. The vesicatory tendency in the skin along the edges of the wound, though partial, in all likelihood depended on some portion being left to cover the wound, which had been previously weakened by disease, and shews that the parts must be healthy to recover from so direct a privation. The sphacelation of the skin over aneurismal tumors, after the operation, is no doubt owing to the same cause.

A question would arise from this view, as to the propriety of merely performing the preparatory

* In a similar case, especially if the tumor were well defined, the operation would be much simplified, if, instead of tying the artery, the surgeon were to cut down upon, and command the current of blood through it, by an assistant pressing it either upon the vertebræ, or between his finger and thumb, until the tumor were removed, and the divided branches secured.

operation, and leaving the diseased mass to slough away. But it appears to me unadvisable, since the sloughing of so large a substance would produce more constitutional derangement than its removal by the knife, and retard, if it would not prevent, the adhesion of the arterial coats.

I do not dwell on the additional confidence which is now afforded, in tying the principal blood-vessels, where there has been no obstruction to the circulation; for though a point of much practical importance, there is already a thorough conviction of its necessity and propriety; and for this conviction we are indebted to Mr. Abernethy, and other surgeons of the present day.

But these operations, always delicate, may be much facilitated by improvement in the instruments with which they are performed. The great variety used, shews that none of them are well calculated for accomplishing the principal objects of the operation. For if strong enough to be directed and passed under the vessel, the instrument has to be turned in the wound, and the property which rendered it valuable in the first stage of the operation, becomes now a great disadvantage. I am happy to present an instrument invented by Mr. Jordan, possessing both these properties, by a contrivance which displays great ingenuity. The following is

an extract from Mr. Jordan's letter, explanatory of it; which with a needle on his principle, I beg leave to submit to this Society.

“When an aneurismal needle is passed under an artery and turned in the wound, the length of the needle is the diameter of a circle, a segment of which must be formed, or the parts forced from their natural position; and although the diameter may be diminished by increasing the curve of the instrument, to do this with the common aneurismal needle, requires more force than it is desirable to use. When the instrument is passed under the vessel, its shaft is worse than useless, but, if we could convert the shaft into an elastic substance, its flexibility would render the turning of the instrument easy: with this view I have formed the inclosed needle.

“Cut off about five-sixths of the shaft of a common aneurismal needle, and to the curved portion, join a piece of elastic steel of a convenient length, in the upper part of which is an eye for the passage of the ligature. To give this the necessary firmness, I have a small silver sheath, which slides upon the steel and covers it, except at the superior part where the eye is formed. This sheath opens laterally, and may be taken off when the firmness of the needle is no longer necessary.”

For the accompanying drawing *, which represents the characters of the tumor more correctly than any description, I am indebted to my friend Mr. Brigham, of Manchester, who favoured me with his attendance at the operation, and took the sketch previous to its performance.

* See Plate I.

Engraved by J. Stewart.