

[Account of a case in which the subclavian artery was tied successfully / by Robert Liston,].

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To James Bryer Esq.
with the Author's most
Respectful Complts

ACCOUNT

OF A

CASE

IN WHICH

THE SUBCLAVIAN ARTERY

WAS

TIED SUCCESSFULLY.

BY ROBERT LISTON, SURGEON,

&c. &c. &c.

CASE OF ANEURISM

IN THE

AXILLARY PORTION OF THE LEFT BRACHIAL ARTERY,

IN WHICH

LIGATURE OF THE SUBCLAVIAN WAS SUCCESSFULLY PERFORMED.

BY ROBERT LISTON, SURGEON,

TEACHER OF ANATOMY AND SURGERY, &c. &c. EDINBURGH.

[From the Edinburgh Medical and Surgical Journal, No. LXIV.]

ON the 31st March 1820, I was asked to see the subject of the following case,—Alexander Gibson, a coachman, aged 35. A soft tumour, the size of a small melon, and of a conical form externally, was situated rather above the level, immediately under and closely in contact with the left clavicle. The pulsation through the whole of it was most distinct, and seemed to extend even above the bone. It could be almost entirely commanded by firm compression with the finger on the vessel at the side of the neck; but all attempts of this kind, after he came under my care, were abstained from on account of the excruciating agony produced by them. The pain thus caused had previously deprived him entirely of rest; indeed the paroxysms were so extremely violent, that he could sometimes be with difficulty retained in bed. The whole arm and fore-arm were benumbed, the hand slightly œdematous, and the circulation in the limb very feeble. The constant torture, greatly aggravated at night, referable to the stretching of the axillary plexus of nerves over the parietes of the tumour, increased by the frequent handling and pressure, had almost entirely made sleep a stranger to him for many weeks. He enjoyed a little rest only after being quite worn out and exhausted by suffer-

ing, and with the assistance of from two to three drachms of laudanum. His shrieks are described by his wife to have been dreadful, so as even to alarm the neighbourhood.

The origin of the disease he refers to a fall from the high foot pavement upon the street five months ago, in which he pitched on the shoulder. Since that time he has complained of what he supposed to be rheumatism in that extremity. The tumour was only perceived six or seven weeks ago, during the process of rubbing the parts with some anodyne. It was small comparatively at that time, but has made its way gradually towards the clavicle, where little resistance is afforded by the loose fatty matter betwixt that bone and the pectoralis minor. The variety of medical men who have seen him, and the consultations on his case have been innumerable. For some time he has been confined to the horizontal posture, bled repeatedly, purged, and religiously starved, according to the plan of Valsalva. So strictly was this fast observed, that, at one time, to abate his thirst, he was allowed only two oranges during twenty-four hours. Nevertheless, in spite of all this severe discipline, the tumour increased with great rapidity, and seemed to be extending above the clavicle, which it had very considerably displaced upwards. When he came under my care I immediately proposed the operation as his only hope of life, at the same time representing the chances for and against him. He instantly agreed to it, but insisted on its being delayed to the 3d of April, which I unwillingly consented to.

On that day, having placed my patient in a proper light, with his head slightly raised by pillows, I commenced my operation by a division of the integuments immediately above the clavicle, in a line with it, and about two and a half inches long, and another incision on the outer side of the sterno-mastoid muscle of one inch and a half, falling perpendicularly upon the middle of the first. The two flaps were then dissected back so as to expose the external jugular vein, which, as lying in the way, was cut across, and the lower orifice (that pointing upwards) which alone bled, secured. Though I had determined to tie every vessel of consequence as I went along, still I was unwilling to put ligatures on the veins if I could possibly avoid it. The other orifice of the jugular, as it gave no trouble, was therefore left untied. In this stage of the operation, the transversalis humeri or supra-scapular artery, was necessarily divided and tied; after dividing part of the omo-hyoideus, I then pursued my dissection to the level of the axillary plexus of nerves. Having cut carefully on their anterior surface so as to feel pulsation distinctly, and detaching what I imagined to be the artery, I

passed a ligature round it. I then carried the ends of the cord through a *serre ligature* so as to ascertain if, by compression of this body, I could stop the circulation or not. In doing this, one of the sides of the ligature was cut through in the eye of the instrument, which had not been properly rounded off, but at a considerable distance from the bottom of the wound. Having laid hold of the end again, and ascertained that one of the nerves, to which the pulsation had been communicated, was surrounded instead of the vessel, I retained the ligature for the purpose of holding the parts out of the way, till by a little cautious dissection I exposed the artery as it passes through the *scaleni*. Here, however, I had reason to believe the vessel unsound, partaking so far of the aneurismal dilatation, and determined on securing it nearer the heart. In this part of the operation, I received the greatest assistance from the spatulas recommended by Dr Colles of Dublin. I was indebted to an old pupil of his for a set of them, which he brought me before the operation. Those I used were made of sheet copper; they are so soft as to be bent easily to any shape, which they retain. With them my assistants, whilst their hands were out of the way, were enabled to hold aside the surrounding soft parts on all sides, so as to protect them from the knife; to prevent oozing from the small vessels; and at the same time, give me a complete view of the bottom of the wound. These spatulas are of the greatest use in the ligature of all deep-seated vessels, the *iliacs*, &c. or in any deep dissection whatever. In fact, I consider them as the greatest addition made to our surgical instruments for many years. Having thus, then, gained a view of the vessel, and ascertained its condition, I proceeded cautiously to divide the *scalenus anticus*. Having cut through its whole thickness, to about its middle, in order to avoid the *phrenic nerve*, I contented myself with denuding the artery by separating those fibres next it, leaving the more superficial ones entire. In this way, as if by burrowing under the muscle, the artery was fully exposed for the passage of the ligature. This part of the operation, by all who have attempted it is considered the most difficult, and for which so many proposals have been made and instruments invented, was at once accomplished with the simple needle, which I had employed in many cases of aneurism, in different situations, previously. For a number of years I had practised this operation, as well as others, on the dead subject; and, from the repeated trials I had made, was satisfied that, even in great deepening of the wound from elevation of the *clavicle*, I should be enabled more readily to achieve my purpose with this instrument than

with any other, of whatever fashion. The difficulty appeared to be, not in bringing up the point of the needle so as to catch the loop of the ligature, but in getting it beyond the vessel. This is readily accomplished with the instrument I used, and which is delineated in the accompanying plate. From its construction at the point, as soon as this can be seen or felt, the ligature is immediately laid hold of by the hook or forceps. Having passed the needle, armed with a strong round silk ligature, under the vessel with but little difficulty, I soon exposed the point, by rubbing the cellular substance betwixt it and my finger, and, with a small hook laying hold of the loop, withdrew the instrument. I then, by tightening the two ends of the cord, and pressing with my finger betwixt them, so as to command the pulsation, assured myself that the ligature was properly placed. From the very great depth and contracted nature of the wound, it was impossible to draw the knot with the fingers, and accordingly it became necessary to have recourse to some mechanical means. The purpose was fully answered by the very simple contrivance of my friend Mr Nasmyth, who obligingly assisted me at the operation. The instrument and mode of using it, is shewn in the plate. We had previously tried it on the dead body, and ascertained its efficacy. The ligature was thus easily secured by a reef knot, with the effect of immediately arresting the pulsation in the tumour and wrist. The patient bore the operation with the greatest courage; with all the preparations, removal, and replacement in bed, it occupied about half an hour. The wound was brought together by three stitches, and covered with dry lint.

The constitutional derangement consequent to the operation was but slight. The pulse, in any part of the body, never was much above 100; nor did the action of the heart or large vessels seem at all disturbed. The patient was instantly relieved from pain, so as to sleep with but a very small dose of laudanum (one-third of what he was in the habit of taking without effect), and the heat of the arm was never at all lessened. The pulsation in the tumour returned on the day after the operation, shewing the great activity of the anastomosing vessels, but disappeared again entirely in two days. On the fourth day, I dressed the wound, and found it adhering completely; but a little matter oozed along the ligature, with some small clots of blood. Next morning, betwixt twelve and one o'clock, I was sent for on account of violent hæmorrhage. On my arrival, I found him a good deal exhausted, and surrounded with blood, apparently venous. On opening the wound, the stream was

perceived to issue from the upper orifice of the external jugular, which had given way on some slight exertion, after the clots had been removed by the suppuration. A firm graduated compress was applied on the parts, and a little wine and water given him, which was continued to the extent of a few ounces every day, to bring about his strength again. No other unfavourable occurrence took place. The ligature separated on the twelfth day from the operation, which demonstrates satisfactorily that nothing but the vessel was included. At this period, a kind of thrilling could be felt in the radial artery, which has increased to pretty distinct pulsation. Three weeks from the operation, he begun to sit up a little in bed; a month after it he walked out; and to day (May 8th) the wound is completely cicatrized. The tumour is greatly diminished in size, and his health is rapidly improving. He walks out daily, entirely free from pain, and sleeps without an anodyne.

The detail of this case must, I doubt not, be interesting, as being the only successful one out of a considerable number operated on in Great Britain. The success met with will, I hope, encourage others to repeat it, and many patients may they thus save from an inevitable and dreadful death.

EXPLANATION OF THE PLATE.

Fig. I. exhibits the mode of tightening the knot of the ligature by means of the instrument,

Fig. II., which may be made of strong brass or iron wire.

Fig. III. represents the needle alluded to in the description of the case. It is made of soft and malleable iron, and may be put into any shape, though the slight curve here shewn is generally preferable. It will be observed, that the eye is small and close to the point, which is as sharp as it can be made without having a cutting edge. Both instruments are very considerably reduced in size.

perceived to issue from the upper orifice of the external jugular vein, which had given way on some slight exertion, after the clot had been removed by the suppurator. A thin graduated compress was applied on the part, and a little wine and water given him, which was continued to the extent of a few ounces every day, to bring about his strength again. No other untoward accident occurred. The ligature separated on the seventh day from the operation, which circumstances satisfied us that nothing but the vessel was included. At this period a kind of thrill could be felt in the radial artery, which was increased to a very distinct pulsation. Three weeks from the operation, he began to get up a little in bed; a month after it he walked out; and to-day (May 18th) the wound is completely cicatrized. The tumor is greatly diminished in size, and his health is rapidly improving. The weeks out daily, entirely free from pain, and without any other inconvenience. A new vein is formed. The details of this case, I do not deem it interesting, as being the only successful one out of a considerable number operated on in Great Britain. The success, not with will, I hope encourages others to repeat it, and many patients may be saved from an inevitable and dreadful death.

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