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BENEVOLENT ASYLUM, SYDNEY, NEW SOUTH WALES,

March 26, 1832.

OPERATION OF TYING THE ARTERIA INNOMINATA.

By W. BLAND, Esq., Surgeon.

Case.

JOHN MULLEN, aged 31, the subject of this operation, had perceived a small and throbbing tumour immediately above, and about mid-length of, the right collar-bone, two years ago; six months afterwards he became affected with superficial pain across the breast, resembling a sensation of tightness, but without any dyspnea. There were also considerable pain and numbness extending along the right arm down to the wrist, and sometimes as far as the extremity of the first phalanx of the fingers, although the sensibility of the whole limb continued equal to that of the left side. He was now placed under surgical treatment, the tumour at this time, according to his statement, throbbing considerably, although not larger than a small pigeon's egg, and, in fact, hardly perceptible when the patient was in a recumbent position. From that period to the present, when he placed himself under my care, the treatment had been merely palliative, having consisted of two bleedings about six months ago—during the first six months, the application of a rag kept wet with cold water night and day—and an aperient pill every morning, with some other occasional laxative as required. Also, now and then, when there was considerable pain, a grain of opium at bedtime. The increase of the tumour from its observed commencement has been gradual and regular. The general health, which continued good during the earlier periods of the disease, has of late become gradually impaired, and within the last few days seriously so. He has, however,

no other perceptible aneurismal affection, nor any disease of the heart. The pulse, which, two or three days before the operation, at which time he first came under my care, had ranged between 100 and 104, but was regular, on the day before, and the day of, the operation, fell to about 60, had become intermitting, and in every other respect was irregular. There was also almost insupportable pain of the left side; the tongue arid, and the dorsum covered with a dense blackish fur, with inability to lie any length of time on his left, in consequence of the above severe pain, and finding equal difficulty of lying on the right side, which had continued during the latter periods of the complaint, and was occasioned by it.

Operation.

The operation, in which I was assisted by Dr. Fattorini, my medical colleague at this institution, was performed this day in the presence of Drs. Smith, Ross, Rutherford, and Jacob.

The patient being placed in a horizontal position on a table with the head supported by pillows, an incision was made through the integuments, extending upwards about two inches from the atlantal edge of the sternum, in the direction of the fibres of the subjacent sterno-hyoid and thyroid muscles, and about one inch and a half downwards below the atlantal margin of that bone, for the purpose of obtaining sufficient room for the subsequent steps of the operation. The sternal insertion of the mastoid muscle was now divided, and the dissection further prosecuted by the careful separation of the fibres of the sterno-thyroid and hyoid muscles, in their longitudinal direction, partly with the edge, and partly with the handle of the scalpel. The fore-finger was now cautiously insinuated through the cellular substance and down to the arteria innominata, and that vessel having been separated from the adjacent nerves, the needle was slowly and deliberately introduced. The ligature, consisting of two threads, was now tied with much care, and with sufficient firmness, it was conceived, to cause the division of the inner coat of the

vessel, and the wound was covered with light dressings. Immediately after the operation, *haustus c. liq. morph. acet. m. xxv et aqua.*

Progress of the Case.

Nine p.m. No pain except that of the left side. V.S. ad $\xi xvij$.

March 27. Quarter to three a.m. Free from all pain; composed; short sleeps; pulse 132.

Five o'clock. Two cathartic pills.

Half-past six. Pulse 144.

Two p.m. Pulse 138. V.S. ad ξx .

Half-past seven. Pulse 138; patient lying on the right side; inclined to sleep; no motion; repet. pilulæ.

28. Half-past five a.m. Calm night; slept at intervals as hitherto; in good spirits; tongue moist, less coated and dark; no motion; perspires freely, and has done so almost ever since the operation. Right upper extremity perspiring freely, warm, of about the same temperature as the left; no numbness, except in the fingers; tumour subsiding rapidly; no disturbance of the sensorium, nor at any time since the operation. Turns (though desired to do so with much caution) and lies on either side with perfect ease; no motion; pulse 126. V.S. ad $\xi xvij$; repeat pills; two hours afterwards a dose of salts.

Half-past three. Pulse 132, full; tongue moist, less coated and dark; one scanty motion. V.S. ad ξxj ; repeat pills and magnes. sulph.; should it become necessary in two hours afterwards, enema.

Seven p.m. Pulse 138. Two motions. *Haust. anodynus.*

29. Half-past four a.m. Two motions; free perspiration; no pain; sleep at intervals; pulse 120, regular, rather full and firm; diet tea, with milk; wound dressed for the first time; healthy.

Half-past seven. Pulse 132, full, hard; languor; drowsiness. V.S. ad ξij .

Half-past nine. Much relief; pulse 120, regular, moderately full. Lemonade; an egg; in other respects, diet as hitherto. *Pilulæ catharticæ.*

Quarter to one p.m. Head quite relieved; pulse 126, regular, and neither hard nor full.

Quarter past six. Pulse 126; calmness; good spirits as in general; no motion. Repet. pilulæ. Magnitude of the tumour reduced one-third; no perceptible pulsation in any of the branches, either of the right carotid artery or right subclavian. Perfect use of both arms.

March 30th, half-past two a.m. A good night; pulse 114, firm, full; no motion. V.S. ad $\xi ijss$. Wound dressed (second time). Repeat pills, one egg.

Seven o'clock. Pulse 108, regular, full, firm; as usual good spirits; no motion. *Pilulæ catharticæ.*

Half-past two p.m. No change.

Half-past nine. Pulse 108, full and firm; slight pain at the scrobiculus cordis; one copious motion; wound dressed; PAIN GONE; breakfast, one egg, one biscuit, one cup of coffee with milk; dinner, half a biscuit, tea with milk; favourite beverage, lemonade. V.S. ad ξij .

31st, half-past six. A good night; pulse 96, full, firm; tongue moist, less and less coated; two scanty blackish motions; wound dressed, healthy. V.S. ad ξij . Transverse admeasurement of the tumour in various directions from three inches to three and a quarter.

Half-past ten p.m. Pulse 108, full, firm; patient stronger, and feels better than at any time since the operation; no pain of any kind, but at times much restlessness. V.S. ad ξv . Wound dressed.

April 1st. An excellent night; pulse 96, full, soft, regular; wound healthy, dressed. V.S. ad ξvj . Permitted to rise at his own earnest entreaty for half an hour.

Half-past eight. Pulse 108, full, firm; pain of the left side, in the same spot in which it had been felt just previously to the operation; one motion. V.S. ad ξij , empl. lyttæ later. Omit egg. Diet to consist solely of gruel, barley-water, rice-water, and these always tepid.

2nd, half-past seven a.m. A good night, though with little sleep; pain utterly gone; no motion; pulse 120, soft, regular, and moderately full; blister dressed; blood not in the least buffed. Aperient pills to be repeated, if requisite, in three hours.

Half-past six p.m. Pulse 102, full but soft; two motions. V.S. ad ξxij .

3rd, half-past seven a.m. An excellent night; composure, calmness; pulse 94, moderately full. Perstet.

Half-past nine p.m. Pulse 102, soft, moderately full; one motion; return of slight degree of numbness in the right arm and hand; bread and tea three times a day; rice-water.

4th (ninth day). A good night; pulse 96, during sleep, after dressing the wound 90; soft, full. Perstet.

Half-past eight p.m. Pulse from 90 to 96; one motion; tongue a little furred.

5th (tenth day). A good night; pulse 90 to 96, full, soft, regular; wound fast filling; discharge creamy, less and less copious; tongue somewhat more furred than yesterday, or the last two days. Bread, tea, lemonade.

Ten p. m. Pulse 96, rather more full and firm than for the last two days. Some morbid heat; slight headache; tongue coated; two motions; keen appetite. Average transverse admeasurement of tumour from three to four inches. V. S. ad z^{v} . Bread, tea, rice-water, lemonade.

6th (eleventh day). A good night; pulse 88 to 90, soft, moderately full; tongue less coated; no motion; wound healthy, fills fast. *Pilulæ catharticae*.

Half-past nine p.m. Two motions; pulse 88 to 90, soft; tongue becoming more clean.

7th (twelfth day). Excellent night; pulse 84, clean, regular, moderately firm; wound healing fast; tongue more clean; appetite good; one motion. *Perstet*.

8th (thirteenth day). Pulse 84; appetite good; one motion; wound healing.

9th (fourteenth day). Pulse 108 (but only half an hour, as it should seem, after his dinner). V. S. ad z^{ij} .

10th (fifteenth day). A moderately good night; but, this morning, considerable soreness of the throat (i.e. of tonsils and pharynx), similar, he states, to an attack he had had a short time before he came under my care, and for which at that time he was wearing a piece of flannel; some dysphagia; pulse 108, somewhat full, hard; wound nearly closed; discharge scanty, but slightly sanious; some febrile heat; one good motion. V. S. ad z^{xiv} . Immediate relief.

Half-past nine p.m. Pulse 108; slight headache; cyanche stationary.

11th. Pulse 102, regular and soft; cyanche stationary; no motion; wound healthy; discharge, however, still slightly sanious. *Pilulæ cartharticae*.

Ten p.m. Pulse 102; surface dry, hot; tongue coated; throat tender, painful; one motion; no food, except a little tea, either to-day or yesterday.

Pulv. Diaphoret. c. pulv. ant. and potass nitrat. Empl. lyttæ extern: faucib., appd.

April 12th (seventeenth day). Half-past four a. m. One motion; hemorrhage from the wound to the apparent extent of about four or five ounces, but which has now ceased; pulse 96, regular, but somewhat weak; febrile symptoms relieved; blister dressed; throat better; wound nearly closed. *Repet. pulv.*

Habeat etiam omnib. hor. tinct. digit. gtt. x.

Fruit, by his own desire; lemonade.

Half-past ten a.m. Pulse 108, somewhat contracted, hard. V. S. ad z^{vi} immediately after bleeding, soft, full, and regular. He has eaten one roasted apple, and taken some tea and bread.

Half-past seven p.m. Second bleeding from wound of only a few ounces, and which had ceased, as in the former instance, before my arrival; in other respects a good day. Obscure pulsations, or faint, irregular, thrilling motions perceptible in the tumour, and which appears to be, and is found to be, increased in size, viz. from the average transverse measurement of $2\frac{1}{2}$ inches to $3\frac{1}{2}$ inches since morning. Director passed to the depth of about three-fourths of an inch by the side of the ligature, but no appearance of blood. V. S. ad z^{xiv} . Surface of the wound sponged with warm water, and left covered only with his clothes. Directions, that it should immediately on the return of hemorrhage be exposed to the air while I was being sent for. Pulse 108, V. S. ad z^{xij} ; subsequently to bleeding, the same in number, but more soft and weak, yielding to pressure, though still regular. One motion during the day; except tea, no sustenance since last visit; no pain; good spirits; throat nearly well; flannel to throat. *Haust. anodynus*.

April 13 (18th day). Two o'clock, slight bleeding, but which immediately ceased, and I was therefore not sent for. Hemorrhage a second time at six, to the amount apparently of ten or twelve ounces; in other respects an excellent night, effect, perhaps, of the anodyne. He is at present disposed to sleep; the hemorrhage has ceased; pulse, however, weak, contracted, intermitting, and in other respects irregular; extremities yet warm, except the right arm; complains of no pain or uneasiness; says he is only weak; soon afterwards, however, desires that the right-hand might be cooled, though it is as cold as marble, and, on being questioned, says no other part feels too hot. Drank by his own desire a little lemonade. Sensorium perfectly undisturbed, and so remained till within a minute or two of his decease, at seven o'clock.

Dissection.

Present, Drs. Smith, Rutherford, Ross, Johnson, and some other medical friends.

The thorax having been carefully and extensively opened, the heart, together with the arch of the aorta, arteria innominata, right carotid artery, and subclavian, including the aneurismal tumour, were removed; and in the course of, and subsequent to, which dissection, the following circumstances were observed:—

1st. That the pleura and contiguous cellular substance had been in no way injured by the operation.

2nd. That the wound had been almost entirely closed from its fundus up to the surface, so that no more than about a teaspoonful of matter was found in its cavity.

3rd. That the ligature which encircled the artery close to its grand division into the right subclavian and carotid, had almost completed the division of the artery.

4th. That the carotid artery had become closed throughout its entire extent by solid coagula, and that about two thirds of the *arteria innominata* itself had become closed by a solid plug of coagulum adhering to its walls, while, on the contrary, the subclavian, from its commencement up to the aneu-

rismal tumour itself, still remained pervious, and whence alone, no doubt, the fatal hemorrhage had proceeded.

This portion of the subclavian also seemed, on careful examination, to be slightly enlarged, and its coats somewhat thickened. The axillary artery was pervious, and contained no coagula.

The remainder of the thoracic and the whole of the abdominal viscera, were in a sound state.

The heart, together with the portions of the arterial tube implicated in the disease, or concerned in the operation, has been carefully preserved. The above is a correct sketch of the parts.

Observations.

The principal difficulty experienced in the operation was the separation of the artery, and the passing of the ligature; to obviate such difficulty on future occasions, I have had a needle constructed upon an entirely new plan, which will accompany this paper, and I hope will be found to answer the object intended. (*See annexed engraving.*)

Respecting the propriety of the operation, I beg to observe, that it was the opinion of the medical gentlemen present, that no other operation (from the advanced state of the case) seemed to offer any chance of success, while it was the unanimous opinion, that without an operation the patient, who at this time was under extreme bodily suffering, as well as mental anxiety, could not have survived more than a few weeks, or perhaps days, and that the operation was adopted at the repeatedly-expressed and earnest wish of the patient himself. The after treatment was conducted with the general view of allaying irritation, and reducing the sanguiferous system to as low a state as seemed consistent with the safety of the patient, and the rapid repair of the unavoidable injury from the operation, and then of carefully preserving it in this state. Hence, considering the reduced condition of the patient (the consequence of his long-protracted painful disease), the copious bleedings at the commencement, accompanied with the lowest possible diet, and again the repeated small bleedings afterwards. The fatal result I attribute partly, perhaps, to the somewhat diseased state of the artery, but still more to a want of decision on the 14th and 15th days after the operation, in not having bled with a more *liberal hand*, an error which arose almost solely from my doubt as to the cause of the excitement, inasmuch as I had discovered that an equal or greater degree of excitement had occurred in a former instance (see 1st April) from the extreme imprudence of the patient, and of which he would have left me uninformed. The inflammatory seizure in the last instance seemed to be the mere effect of cold, caught, as was afterwards ascertained, by the patient imprudently throwing aside the additional flannels used as a protection to the right side of the trunk, and the upper extremity and neck.

The principal, if not the sole source of the hemorrhage, might have been inferred prior to the death of the patient, from the previous history of the case, together with the obscure and irregular thrilling motion in the tumour, as well as its increased magnitude, noticed on the 12th of April, the day before his decease.

Description of the Needle.

a the flat part, or handle, of the needle, on which the lever (*c c*) rests that is to elevate or depress the curved end of the needle *b*, which end *b* is attached to the handle *a* by a hinge. In the curved piece are two small holes for the ligature. *d* a moveable flap which may be brought down so as to form a straight line with the flat part *a*, to which it is attached by a hinge. Or it may be elevated so as to form nearly a right angle with the handle *a*, in which position it will depress the curved piece *b*, till the extreme point of *b* is in a straight line with *a*. When *d* is depressed to its full extent, the end of *b* will be brought forward towards *d* until the end of *b* curves at least half-an-inch over the handle *a*, that is, in a position which would allow of a straight line to be drawn from the extreme end of *b* to the point marked near *e*.

f is a little bridge which keeps *c c* in its proper place.

g is a spring attached by a screw to *a*, with a little elevation of its end to allow the thumb to press it back from the lever *a* when the curved end is about to be depressed. At this part in the lever *c* there are six small cogs, or teeth, in which a little tooth at the end of the spring *g* catches when at rest, preventing *d* from being elevated until the spring *g* is pushed away, but from the direction of the cogs allowing the curve *b* to be pulled forwards and elevated when *d* is depressed.

The left hand end of *c* is attached to a short neck, which is fixed to *b* and united to *c* by a hinge. The whole is constructed of steel. The drawing is a full length representation of the instrument.