

Case of aneurism of the innominata, treated by ligature of the right carotid artery; with observations / [Sir William Fergusson].

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CASE

Removal of

OF

ANEURISM OF THE INNOMINATA,

TREATED BY

LIGATURE OF THE RIGHT CAROTID ARTERY;

WITH OBSERVATIONS.

BY

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BALFOUR AND JACK, PRINTERS.

CASE OF ANEURISM OF THE INNOMINATA,

TREATED BY

LIGATURE OF THE RIGHT CAROTID ARTERY;

WITH OBSERVATIONS.

Charles Messenger, aged 56, a bricklayer's labourer, was admitted, under my care, into King's College Hospital, on the 12th of June 1841. He then stated that he had enjoyed good health till within the three preceding months, when he experienced severe pain in the right side of the head and neck, extending through the shoulder and arm of the same side. A cough, with which he had been annoyed for many years, became more troublesome, but was not accompanied with pain in the chest, nor in the respiratory passages. Two months before admission he first perceived a small pulsating tumour, about the size of a hazel nut, situated directly above the inner extremity of the collar bone. He had never had much pain in the tumour itself; but the other pains, with the cough, continued until admission. The swelling, since it was first observed, had gradually increased. He felt well in other respects; pulse 80, steady and natural; appetite good; bowels regular. He served as a soldier in the East Indies for nineteen years, during which time he enjoyed good health. About nineteen years ago he returned, since which time he has had no complaints excepting an habitual cough, and an attack of inflammation in the bowels about two years ago. He considered himself a temperate man, though admitting that he was occasionally in the habit of indulging in spirits.

The tumour was seemingly about the size of an orange. When

examined carefully, it was observed to pulsate strongly, and its pulsations were synchronous with those of the arteries: it was very compressible and seemed filled with fluid blood only; it was situated immediately behind the lower extremity of the sternocleido-mastoid muscle of the right side; its pulsations could be distinctly felt on the outer margin of this muscle; it occupied a part of the space between the two mastoid muscles, and extended about two inches above the upper margin of the sternum. The right carotid and subclavian arteries could be felt beyond the tumour, each pulsating regularly in its normal situation. Pressure on the carotid, opposite the larynx, caused sudden diminution in the size of the swelling, and singular slowness in the pulsations, with a feeling of giddiness, sickness, and faintishness. Pressure on the subclavian, outside of the *scaleni* muscles, caused less perceptible change, and produced no other marked effect. Simultaneous pressure on both vessels caused a rapid decrease in the size of the tumour; the skin over it wrinkled, and the pulsations seemed almost to cease. The pulse was less perceptible in the right radial artery than in the left. The veins at the root of the neck and fore part of the right shoulder, were fuller and more conspicuous than on the left side. The viscera of the chest seemed healthy; the action of the heart was natural; and there was no reason to suppose that the arch of the aorta, root of the innominata, and arterial system, elsewhere than in the seat of the tumour, were not in as healthy a condition as is natural at the patient's period of life.

As there could be little doubt that this tumour was an aneurism of the innominata, and as the case seemed in every respect favourable for the ligature of one or both arteries beyond the disease, I determined, after having taken the opinions of my colleagues, of Mr Arnott, Mr Wardrop and others, to place a ligature on the carotid; entertaining the hope that obstruction of this vessel might alone suffice for the cure; having however the intention, should this expectation not be fulfilled, of tying the subclavian at some future period.

The patient, who had, previous to his arrival in town, been under the care of Mr Bulley of Reading, was placed upon a spare farinaceous diet; had several doses of laxative medicine; was ordered a fourth of a grain of tartarized antimony thrice a-day; was bled from the arm to eight ounces, and kept quiet for ten days, during which time no marked change occurred, either in his health or in the condition of the tumour, unless it was, that the latter had slightly increased in size.

On the 22d of June 1841, at one o'clock P.M., he was carried into the operating theatre of the hospital, and, in the presence of my colleagues, Mr Wardrop, Mr Arnott, Mr May of Reading, Mr Bulley, a number of other professional friends, and

the pupils of the hospital, I placed a ligature on the common carotid, immediately below its bifurcation. Having ascertained from Mr Bulley, that the patient had actually fainted on one occasion, in consequence of pressure with the fingers in the course of the carotid, I resolved, before tightening the ligature, to mark the effects of obstructing the course of the blood in that vessel by itself; and accordingly, when the needle was under the artery, I ascertained, by pressing with the fore finger, that sudden obstruction produced no immediate remarkable symptom, such as had been previously experienced. I therefore, without further hesitation, cast a firm noose upon the vessel, and, after removing one end of the thread, brought the edges of the wound into apposition, and kept them thus by means of stitches and adhesive straps. Nothing very unusual occurred during the operation. I made the incisions very oblique to the course of the artery, with the object of leaving the tumour undisturbed, and thus averting as much as possible any immediate danger of wounding the sac, or the chance of subsequent inflammation. The ligature was consequently placed very high. The artery was only uncovered to such an extent as to allow the needle to be slipped around it. The proceedings were somewhat retarded by hemorrhage from a small artery and a vein situated immediately under the skin; but by means of a ligature, and the pressure of a curved copper spatula, which was used to assist in keeping the wound open, this annoyance was quickly overcome. Before the patient was removed from the table, the tumour seemed slightly diminished in size, and the pulse in the right wrist was fuller and more bounding than it had been previous to the operation, and much more distinct than that in the left; on being placed in bed, he expressed himself cheerfully, and seemed unconscious of any change produced by the recent proceedings.

At seven o'clock—pulse 80; complains of slight dizziness, and difficulty of breathing; otherwise comfortable.

At nine o'clock—the giddiness and difficulty of breathing have gone off.

At eleven o'clock—pulsation in the tumour much the same as immediately after the operation; a slight thrill is perceptible in the right temporal artery; pulse 80, soft, and now nearly the same in both wrists; feels easy; has dozed at intervals, and has now taken an opiate draught.

23d. Nine A.M. Did not sleep till morning; perspired freely during the night; pulse 90, soft; complains of slight pain in the neck during deglutition.

One P.M. Pulse 100, full and strong; tongue moist; slight thirst; skin covered with gentle perspiration; cough less troublesome than before the operation.

Nine P.M. Pulse 110, soft and compressible; skin moist; no thirst; bowels have been opened once.

24th. One A.M. Has slept during the greater part of the night, and muttered a little; pulse 110, soft; skin and tongue moist; bowels open; still complains of pain in swallowing. Stitches removed from wound, which has united throughout its entire extent, excepting where the ligature is placed. The tumour is decidedly smaller, and the throbbing is less distinct.

25th. Slept well during the night; pulse 110, soft and compressible; rather stronger in the left wrist than in the right; the clavicle and sternum now much more distinct than before the operation; expresses himself and looks much better to-day.

26th. Still continues to do well.

27th. One P.M. Has been much troubled during the night with cough, attended with difficult expectoration, but has slept tolerably well during the morning; pulse 100; stream of blood through the right radial artery giving the impression of a smaller current than in the opposite arm.

Ten P.M. Pulse 110; skin cool and moist; cough troublesome. He is much annoyed by mucus collecting in the larynx; bowels confined; to have a purge of calomel and jalap. To-day the bronchial tubes seem partially filled with an excess of mucus, and he has occasionally, though with seeming reluctance, complained of slight pain in the chest whilst coughing.

28th. One P.M. Has slept tolerably during the night, though much troubled by cough and difficult expectoration; pulse 110, and much the same in both wrists; breathing somewhat hurried; countenance anxious, and in his manner there is an appearance of distress, for which it is difficult to ascribe a direct cause. There is evidently slight bronchitis, but this does not seem sufficient to account for his present condition. Bowels being still confined, I ordered an enema, and $\bar{\zeta}$ xii. of blood to be taken from the left arm.

Ten P.M. Cough more troublesome; respiration hurried and more difficult; blood drawn in the morning, cupped and buffed; pulse 120. The wound in the vein reopened, and blood allowed to flow to the extent of $\bar{\zeta}$ xxviii, when the patient became pallid and faint, the pulse at the wrist being nearly imperceptible. At this period, the tumour decreased in size, and its pulsations were much weakened. Bowels opened by the enema; the small doses of tart. of antimony, which have been continued throughout the treatment, ordered to be omitted; three grs. of calomel, one of opium, and one of extract of hyosciamus to be taken immediately.

29th. Blood drawn last night of an inflammatory character. Cough and expectoration have ceased since the bleeding; great

difficulty of breathing throughout the night; respiration hurried; countenance anxious and pallid. Pain in deglutition, which has always been felt since the day following the operation, not so great; mouth dry; hands and feet cold; pulse 120, small and weak. Wound has continued to look well; the left side of the neck opposite the larynx seems fuller than heretofore. Ordered to have three grs. of carb. of ammonia in ʒss. of spirit. ether. nit. every hour; wine and brandy, ad libitum, and sinapisms to the calves of legs.

Four P.M. Distress and difficulty of breathing greater; respiration very hurried; pulse 130, small and scarcely to be felt at wrist; hands and feet very cold; lies constantly, as indeed he has done ever since the operation, on his left side; pays little heed to what goes on around him, and only answers questions when they are put in a loud tone of voice; complains of pain in the epigastrium, for which a blister has been ordered. Stimulants to be continued.

Eight P.M. Has continued to sink gradually since the last report, and at this hour death has supervened, unattended with any remarkable symptoms.

Sectio cadaveris, eighteen hours after death.

The external aspect of the body presented no unusual appearance. The tumour was almost as perceptible as it had ever been; it felt firm, and was not so compressible as before death. The thorax was opened, by turning up the lower portion of the sternum; the upper part of this bone being, for the present, left *in situ*. The right lung appeared remarkably healthy, and there was no effusion in the cavity of the pleura. The left lung was slightly adherent at its middle lobe to the pleura costalis; apparently the result of inflammation of a former date. The upper lobe was, to all appearance healthy, as was also the lower; the middle was of a darker colour, and felt more consolidated than any other part of the organ. There was no effusion into the pleura, and this membrane presented no marks of recent inflammation. Sections of any part of the right lung presented no unusual or remarkable appearance, excepting that in all parts there seemed a greater quantity of mucus than was natural; the same remarks are applicable to the upper and lower portions of the left lung; the parenchyma of the middle lobe, however, was gorged with blood and mucus; here and there patches of recent lymph were observable, and several of these were mingled with small effusions of pus.

The larynx, trachea, and bronchial tubes were loaded with ropy mucus, and their lining membrane was very vascular.

The heart was slightly enlarged; there was a patch of lymph on its anterior surface of old date, but otherwise it was healthy in appearance. About an ounce of fluid was found within the

pericardium. The valves of the aorta were healthy, and this vessel, though somewhat enlarged, presented nearly the usual appearance at this age. The innominate, left carotid, and left subclavian originated in their usual manner; the two latter were of a natural appearance throughout their extent; the innominate at its origin was of a size proportioned to that of the aorta, but otherwise healthy and natural in condition; about three-fourths of an inch above its origin, it suddenly enlarged, and projected forwards against the sternum; and this swelling was found to be continuous with the tumour at the root of the neck.

The skin of the neck being raised, the sterno mastoid muscle was found slightly spread, and covering the swelling; the lower parts of the sterno hyoid and sterno thyroid muscles were lost in its substance; the subclavian artery, outside of the scaleni muscles, was found in its natural situation and condition on the upper surface of the first rib, and the carotid, behind and above the tumour, was pushed slightly to the right side; it appeared healthy, and of its usual size. The ligature was still very firm, and was placed about one-fourth of an inch below the bifurcation. Little more than one-eighth of an inch of the vessel had been exposed during the operation, and the par vagum and internal jugular were undisturbed in their usual relative position.

Between the artery at the seat of ligature, and the larynx, the cellular texture presented all the appearance of recent inflammation, and several little abscesses, surrounded by cysts of recent lymph, were found in its substance.

The tumour, with the upper portion of the sternum, and inner ends of the clavicles, was now carefully removed, along with the larynx, trachea, and larger vessels at the root of the neck. It was observed to push the trachea a little to the left side, but had produced no change on the right bronchus. A further investigation showed, that it originated entirely from the anterior and upper part of the innominate. The carotid, on a close inspection, though in close contact with the swelling, was not in any way affected, nor did it form any portion of the sac; the subclavian was slightly dilated at its origin, and its anterior wall swelled out, and was continuous with the aneurismal tumour.

The aorta, innominate, subclavian, and carotid were laid open behind; a clot of fibrin, similar to that which is frequently met with as a post-mortem occurrence, was found in the arch of the aorta; a portion extended into the innominate, and was continuous with a larger clot of fibrin, which nearly filled the sac. There was no clot in the subclavian, nor was there any in the carotid, even as high up as the ligature.

The tumour was opened in front, above the sternum, and was found to be nearly filled with pretty firm clots of fibrin, different in appearance from that in the aorta; being similar to such as

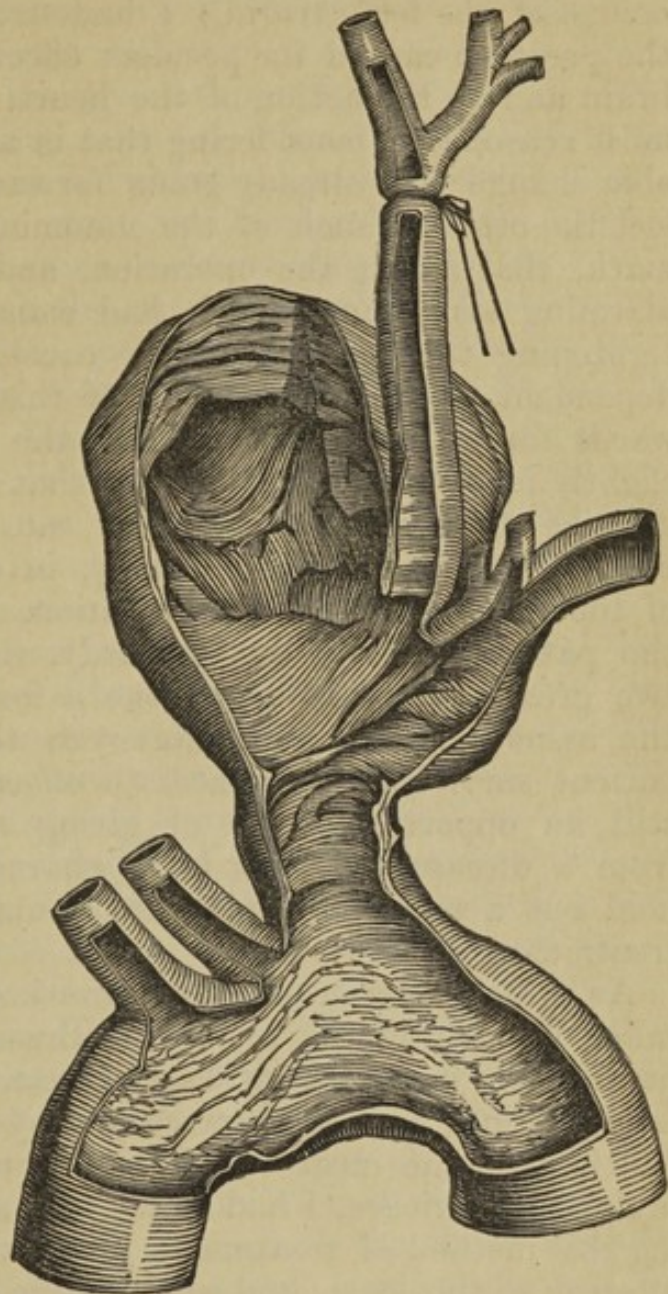
are met with in aneurismal sacs, about the same period after the Hunterian operation has been performed.

The par vagum was found in close contact with the right side of the tumour, the recurrent was behind it, and both were in intimate connection with the sac; each being in some degree flattened, but in no other respect altered in appearance. The internal jugular and subclavian veins were of their natural appearance; the innominate of the left side was slightly elongated, being pushed downwards and forwards; that of the right side was in some degree displaced and compressed; but in neither was there any change of the tunics.

The parts when prepared for preservation are faithfully represented in the accompanying sketch.

The head and abdomen were opened, but no morbid appearances were observed.

The above case adds another to the list of aneurisms treated by the method so strenuously and ably proposed and advocated by Mr Wardrop. In coming to the resolution of obstructing the circulation in the carotid only, I was influenced in part by the opinion of that gentleman, that no farther operation might be required, and partly by the circumstance, that in most of the cases of aneurism at the root of the neck, which had been treated by this operation, the ligature of this vessel seemed to have been sufficient to produce the immediate and ultimate beneficial effects of this novel method of cure. I was also prepossessed in favour of this operation, by the more marked effects produced on the tumour, whilst pressure was applied in the course of the carotid, as well as by the pulse in the right wrist being less distinct than in the opposite side. Though, on the first of these points, (as similar symptoms were observed by pressing on the



course of the left carotid,) I had strong reason to suppose that the pressure caused its peculiar effects, by its influence on the brain and on the action of the heart, or *vice versa*, I deemed it most reasonable, considering that in all probability some favourable change was already going forward in the subclavian, to select the other branch of the innominata. It is worthy of remark, that during the operation, and after its completion, the alarming symptoms, which had caused me to hesitate about tightening the ligature on the carotid, were proved to be not dependent on the obstruction of this vessel; and it was afterwards found on dissection that the subclavian artery was so slightly involved in the disease, that it is scarcely possible to imagine that such a condition caused the difference in the pulse of the two arms. Finally, in selecting only one branch of the innominata for an operation, I concluded that I placed the patient's life in less jeopardy, than by subjecting him to two great operations (each one a formidable risk in itself) at the same period; and, moreover, that in the event of the patient surviving the immediate effects of one operation, I had still an opportunity left of giving another chance of safety from a disease too fatal in its character to enable any one to hold out a reasonable prospect of cure by any other method of treatment.

As a teacher of a practical branch of medicine, I had always taken interest in the history of Brasdor's operation, and more particularly in the scientific modification of that celebrated proceeding, first put into execution by Mr Wardrop, and with which his name must ever be connected; yet, in the course of my own experience, I had never had an opportunity of witnessing this method of treatment. I therefore felt more than usual interest in this case, and was gratified, that through the kindness of Messrs May and Bulley of Reading, I should have an opportunity of speaking to my pupils from personal observation on this subject.

In conversing on the history of this operation with several professional friends, whose knowledge and judgment I hold in the highest estimation, I had no difficulty in perceiving, that, though in many respects they were favourably impressed with its general results, there was still, as they thought, something wanting in this country, to give it the stamp of general professional approbation; and it occurred to me, that further experience in hospital practice constituted the chief desideratum above alluded to. I hazard this opinion with great deference and respect towards the various practitioners who have, in the course of private practice, performed such operations; for it is impossible to overlook such valuable histories as that given by Mr Evans of Belper, of the case in which he successfully treated an

aneurism of the innominata and root of the carotid, by ligature of the latter vessel. Mr Fearn of Derby, whose name is honourably connected with the history of this operation, I have the pleasure of ranking among my personal friends; and, during a season of his studies passed in Edinburgh, I had too much experience of that gentleman's great zeal, and professional knowledge, to allow me for one instant to doubt his skill, or the value of his observations. Though the revered names of Deschamps, Astley Cooper, Home, Mott, and Dupuytren, are inseparably connected with this history, (and to this list might be added those of White, Wardrop, Lambert, Bush, Langier, Montgomery, Morrison, Scott, Key, Wickham, and perhaps others,) yet it must be confessed that the surgeons of the numerous and great hospitals in Britain, have not displayed their wonted zeal in elucidating this most practical question.

It is a subject of deep regret to me, and I hope it will be looked upon in the same light by others, that in the case whose history has now been given, death ensued at a period so soon after the operation, that no opportunity was given to permit of a decision being formed regarding its permanent effects on the disease. It can scarcely be doubted that death was occasioned by the operation; that the changes in deglutition, respiration, and in the lungs, particularly the left, were the immediate effects of the wound in the neck, and the sudden alteration in the arterial circulation. But in drawing this conclusion, it does not follow from thence, that death is attributable to the peculiar operation pursued in this case. No one, now-a-days, will condemn the principle of the Hunterian operation, because of the failure of one or more cases; neither, in my opinion, is it correct to condemn Wardrop's operation, on proof such as the above instance affords. Had any other great operation been performed on this individual, in all likelihood a similar result would have followed; and I am firmly convinced, that if the lower part of the carotid had been tied for an aneurism of the upper portion of the vessel, a similar train of symptoms, and the like event would have followed. I attribute death in this case to the same causes which bring to a fatal termination many other operations in surgery, undertaken by the most judicious practitioners, and in the most favourable cases; causes, whose existence the surgeon's foreknowledge cannot enable him to appreciate or detect, and over whose injurious influence he has unfortunately little control.

From the latter remarks it will be observed, that I do not feel inclined to allow, that the death of this patient should at all influence our opinions of Wardrop's operation; and I must reiterate my regret that a longer time has not been permitted me to judge of its more permanent effects on the disease. I should however be doing injustice to the limited opportunity already

afforded, were I not to express my conviction, that in this case, in so far as the aneurismal sac was concerned, the changes considered favourable for a permanent cure, had gone on in a most satisfactory manner. The sac had diminished in size, and after death, was found filled by clots of fibrin, which I am satisfied were only formed after the operation.

The symptoms after the operation were in some respects peculiar; as, for example, the difficulty of swallowing, and also another which is not referred to in the report, viz. an inability to modulate the tone of the voice, which, when he spoke, resembled that of a boy at the age of puberty. The former of these, and perhaps also the latter, may be attributed to the inflammation and suppuration in the textures between the wound and the side of the larynx. The same condition of the parts may account for the increased fulness observed in the left side of the neck; the parts covering the larynx and trachea perhaps yielding more readily to pressure from swelling, than the textures on the right side, already condensed by inflammation. It will be remarked, in the report, that the pulse gradually rose from the second day after the operation; a circumstance which made me more uneasy than I might otherwise have been: I must confess, however, that, though convinced of the existence of bronchitis, I had no suspicion that there was such an extent of inflammation in the left lung, as appearances on dissection evinced; and it is remarkable that the patient should have made no particular complaint of pain in this region. The softness of the pulse, the cool and moist state of the skin, and the absence of all those symptoms usually denoting serious inflammation in the chest, seemed to me sufficient to lull all suspicion of wrong. I have often wondered since, whether the action of the tartarized antimony on the heart and on the skin, could have given rise to deception? and also, what might have been the effect of abstraction of blood at an earlier period in the treatment? The latter question I deem one of great practical importance, in reference to the treatment of aneurismal cases after operations; but its discussion would lead me beyond the scope of this paper, which, I fear, has already extended beyond all reasonable limits.