A CASE

OF

ANEURISM OF THE CAROTID ARTERY.

BY ASTLEY COOPER, Esq. F. R. S.
SURGEON TO GUY'S HOSPITAL.

Read Jan. 29, 1806.

MARY EDWARDS, aged 44, was brought to my house by Mr. Robert Pugh, of Gracechurch-street, that I might examine a tumor in the neck, which was obviously an Aneurism of the right Carotid Artery. I advised her to become a patient in Guy's Hospital, and she was admitted on the 23d of October, 1805. The account she gave of the disease was, that the tumor appeared five months before, situated rather above the middle of the neck; its size at first being only that of the end of the finger; that it beat with very great force, and occasioned a strong pulsation in the brain; that it gradually increased upwards, until it reached the lower jaw, and extended downwards below the middle of the neck; that for
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a fortnight previous to her admission, the pulsation in it and in the brain had been so strong as to prevent her sleeping; that the scalp on that side was tender, so as scarcely to bear the touch; that she had great difficulty in taking any solid food, and was constantly teased with a violent cough.

Upon examination of the swelling I found that it occupied two-thirds of the neck; it had a very strong pulsatory motion, and the skin was thin at its most prominent part. When the swelling was examined at the hospital, great doubts were entertained if there was sufficient space between the clavicle and the tumor for the application of a ligature, and as her husband objected to the operation, she quitted the hospital.

In a few days, hearing that all her symptoms were increased, I called at her house, and strongly pointing out the probability of a fatal termination of the disease, I gained her consent and that of her relations to an operation.

On Friday, Nov. 1st, 1805, the operation was performed, in the presence of Mr. Pearce, Surgeon, and Mr. Owen, Apothecary to the Universal Dispensary, Ratcliffe Highway, of Mr. Travers, Surgeon, and that of five other Medical Gentlemen.

The tumor at this time reached from near the chin beyond the angle of the jaw, and extended
downward to within 2½ inches of the clavicle. I made an incision two inches long, on the inner edge of the sterno-mastoid muscle, from the lower part of the tumor to the clavicle, which laid bare the omo- and sterno-hyoideus muscles, which being drawn aside towards the trachea, exposed the jugular vein. The motion of this vein produced the only difficulty in the operation, as under the different states of breathing it sometimes presented itself to the knife, tense, and distended, and then as suddenly collapsed. Passing my finger into the wound to confine that vein, I made an incision upon the carotid artery, and having it laid bare, I separated it from the par vagum, and introduced a curved aneurismal needle under it, taking care to exclude the recurrent nerve on the one hand, and the par vagum on the other. The two threads were then tied about half an inch asunder, being the greatest distance to which they could be separated; I thought it proper not to run the risk of a hæmorrhage by dividing the artery, as I was fearful the ligatures would be thrown off by the force of the heart, and the distance was too small to allow of any means being used to prevent it. As soon as the threads were tied, all pulsation in the tumor ceased, and the operation being concluded, and the wound superficially dressed, she rose from the chair in which she sat during the operation, and was immediately seized with a fit of coughing, which I thought would have terminated her existence. This seemed to arise from an accumulation of mucus in the trachea, which she could
not expel; it continued about half an hour when she became more tranquil.

**Saturday, Nov. 2.** — Mr. Owen, who had sat up with her, reported that she had slept six hours during the night, but was now and then disturbed by her cough. The pulsation in the tumor has not returned; that in the brain has ceased, and there is no appearance of diminution of nervous energy in any part of the body.

**Sunday, Nov. 3.** — Last night as she had some pain in her head, leeches were applied. To-day the pain in her head is gone; her cough is less troublesome; her stools and urine are natural; pulse 96.

**Monday, Nov. 4.** — Slept six hours last night; her spirits are good; pulse 100.

**Tuesday, Nov. 5.** — In the afternoon, I found her, as may be supposed contrary to my orders, sitting before the fire with three other persons, drinking tea, which she swallowed with great difficulty; she had no pain in her head; her pulse 96, and the only circumstance of which she complains, is that her cough is troublesome.

**Wednesday, Nov. 6.** — In a violent fit of coughing last night, a slight discharge of venous blood took place from the wound. Mr. Hopkie, of Ratcliffe Highway, was called to her; but the bleeding ceased
with the cough, and a piece of lint was laid lightly on the wound; in the afternoon her cough was less troublesome; her pulse only 92.

_Thursday, Nov. 7._—My colleague, Mr. Forster, accompanied me to see her and to make a drawing of the tumor, which he thought was reduced one-third. She slept eight hours last night; her pulse 94.

_Friday, Nov. 8._—Evening; I was sent for by Mr. Owen and Mr. Roberts, who alternately sat up with her, on account of their observing, that her left arm and leg were paralytic. I found them benumbed, and she moved them with great difficulty; but as her pulse was weak, and she laboured under considerable constitutional irritation, I thought the powers of these parts would be restored as her health improved. She had passed a very restless night, complaining that her bones were sore, and that her teeth felt as if softened. Her head is free from pain.

_Saturday, Nov. 9._—Her cough is less troublesome; her pulse is 90; her spirits good; she talks with cheerfulness, and moves her arm with more facility than yesterday. She slept eight hours last night; she said she must have something to eat; but upon attempting to swallow solids she was incapable of doing so. She has no pain either in the head or tumor, but says, when she coughs she feels a prickling pain in the wound.
Sunday, Nov. 10. — I did not see her.

Monday, Nov. 11. — She had passed a good night; her left arm she now moves with more facility, but I thought with not quite so much ease as the other. She is in good spirits, and has some appetite, but cannot swallow solids. Her chief sustenance is arrow root, to which, as she had been very much accustomed to take spirits, a little wine is added. — Her cough is sometimes very violent; her pulse is only 84; the ligatures are projecting further from the wound, than at any time since the operation.

Tuesday, Nov. 12. — My colleague, Mr. Lucas, accompanied me to see the woman, this day. We found her in good spirits, and the pulse only 82, her cough less troublesome, and she was able to sit up and use her arm with so much facility, that it required that the attention should be particularly directed to the part, to discover any difference in the powers of the two arms.

When the dressings were removed, the ligatures were drawn from the wound, including the intervening portion of artery. The edges of the wound were then brought together by adhesive plaster.

Wednesday, Nov. 13. — Her cough is less troublesome; she swallows liquids with more ease. The only complaint she makes is of a pain in the back, of which she was relieved by a dose of magnesia vitriolata.
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Thursday, Nov. 14. — She slept eight hours last night, and her state is in every respect improved; she swallows with less difficulty; the tumor is reducing in size, and is entirely unattended with pain. As I now considered her out of danger I did not visit her on Friday or Saturday; but Mr. Jones, one of my house-pupils, visited her and found the wound nearly closed.

Sunday, Nov. 17. — I was much disappointed to find her labouring under a high degree of constitutional irritation; the tumor was also increased and very sore upon pressure; the wound was as large as immediately after the operation, and discharged a sanious serum; she complained of a great difficulty in swallowing, and of a most distressing cough, after the fits, of which she hooped violently; her pulse 96; and her left arm again weaker than the other.

Monday, Nov. 18. — She had passed a restless night; complains of pain in her head, and the size of the tumor has increased; there is great soreness upon the neck, when it is pressed; the pulse is quick, and the tongue is furred.

Tuesday, Nov. 19. — Her pulse is very quick; she had no sleep last night, although she took forty drops of tincture of opium; the tumor is still more increased, and the skin over it of a brownish red colour.
Wednesday, Nov. 20.—She had slept three hours last night; her pulse is 108, and small; she is unable to swallow even her saliva, which constantly dribbles from her mouth and every attempt at deglutition; produces a violent cough.

Evening.—Her pulse 120; she is in a profuse sweat; and still unable to swallow.

Thursday, Nov. 21.—She died.

DISSECTION.

The aneurismal sac was found inflamed, and around the clot of blood which it contained, there was a considerable quantity of pus.

The inflammation extended on the outside of the sac along the par vagum, nearly to the basis of the skull.

The glottis was almost closed, and the internal surface of the trachea was inflamed, coagulating lymph adhering to its mucous membrane.

The sudden increase which the parts had undergone from inflammation, added to the size of the
tumor previous to the operation, had occasioned so much pressure upon the pharynx, that it would not easily admit a bougie of the size of a goose quill.

The nerves, as may be seen, sustained no injury, the ligature having passed between the recurrent and the artery on the one hand, and the par vagum on the other.

The cause of her death then, was the inflammation of the aneurismal sac and the parts adjacent, by which the size of the tumor became increased so as to press on the pharynx and prevent deglutition, and upon the larynx, so as to excite violent fits of coughing, and ultimately to impede respiration.

A similar event, however, may be in future prevented, by performing the operation when the tumor is small, and pressure has not been made by it upon important parts, or if it is of considerable size, as in this case, by opening the tumor and discharging the coagulum, as soon as inflammation appears.*

As I could not obtain permission to open the head, the cause of the paralysis remains unknown. It did not immediately succeed the operation, but was observed first on the eighth day after it. It

* Since this paper was read to the Society, another case has occurred which has terminated successfully and will be given at the end of this volume.
came on while she laboured under great constitutional irritation, lessened as it decreased, and returned when the irritation became greater; but as it appeared that the irritation which she suffered was owing to the operation being too long deferred, it will not prevent my performing it in any case in which the disease is somewhat less advanced.

It appears that no objection can be made to this operation on account of any unusual danger of bleeding at the time the ligatures separate, since, although they were discharged from the wound on the twelfth day, and they were certainly separated from the artery on the eleventh, the ulcerated extremity of the vessel had been closed by the adhesive process and by a clot of blood which adhered strongly to its coats. Hence we may conclude, therefore, that the carotid artery may be, in this respect, as safely tied as any other artery in the body.*

* It gives me pleasure to find, that the carotid artery has been since successfully tied by my friend, Mr. Travers. See Medico-Chirurgical Transactions, vol. II. page 1.
EXPLANATION OF THE PLATES.

PLATE THE FIRST.

FIG. I.

A. Trachea.
B. Larynx.
C. Larynx inflamed and ulcerated.
D. Jugular vein.
EE. Par Vagum.
F. Recurrent Nerve.
G. Arteria Innominata.
H. Right Subclavian Artery.
I. Carotid Artery above the tumor.
K. Carotid Artery, with a portion of it removed to shew the clot within it.
L. The Clot continued within the Arteria Innominata.
M. Clot in the Artery above the tumor.
N. The ulcerated Artery, where the ligature had been applied.
PLATE THE SECOND.

FIG. I.

A. Trachea.
B. Epiglottis.
C. Oesophagus.
D. Pharynx; contracted by the pressure of the tumor.
E. Arteria Innominata.
F. Right Subclavian Artery.
G. Par Vagum.
H. Recurrent Nerve.
I. Phrenic Nerve.
K. Aneurismal Sac.
L. Coagulum in the Aneurismal Sac.

FIG. II.

I have added to this plate a view of a Carotid Artery which had been obliterated by pressure. It was taken from a man who died in Guy's Hospital with an Aneurism in the Curvature of the Aorta. — The disease passed into the neck behind the Sternum, and reached as high as the side of the Larynx, producing great difficulty in deglutition and breathing. His mind continued perfect till his dissolution, and he had no paralytic symptoms. On examination, the left Carotid Artery was found obliterated as far as its division into external and internal.

A. The Common Carotid. B. External Carotid.
E. The clot adhering to the inner coat of the artery.

Dr. Baillie has described a curious case of obliteration of this Artery, in the "Transactions of a Society for the Encouragement of Medical and Chirurgical Knowledge."
SECOND CASE

OF

\[ \text{CAROTID ANEURISM.} \]

BY ASTLEY COOPER, ESQ. F.R.S.

SURGEON TO GUY'S HOSPITAL.

\[ \text{Read Feb. 21, 1809.} \]

In the year 1806, I had the honour of presenting to this Society an account of an operation for carotid aneurism, which terminated unsuccessfually.

I then took the liberty of observing, that I thought that the result of that case ought to have no influence in preventing a similar operation under more favourable circumstances, as the death of the patient was attributable to the advanced stage of the disease at the time of the operation. The aneurismal tumour had become so large, as to press upon the air tube, and occasion cough, difficulty of breathing, and even effusion of coagulable lymph upon its internal surface; and it had also compressed the pharynx, in a degree to prevent even the passage of fluids into the stomach.
CAROTID ANEURISM.

I had no apprehension of the functions of the brain sustaining any permanent injury from a ligation on the carotid artery, having the evidence of Dr. Baillie to prove, that one carotid had been entirely obstructed, and the diameter of the other considerably lessened in the same person, without any apparent ill effects. I have also given a drawing in my former paper, of the left carotid artery being obstructed by the pressure of an aneurism of the aorta; and we have the analogy of animals to show, that both carotids may be tied without any visible effect upon the functions of the nervous system. I had many years ago made the experiment of tying these vessels in the dog, and immediately as it was concluded the animal was placed upon the ground, and shewed no diminution of voluntary powers. It exhibited the same fears and affections as before, and betrayed no greater loss of appetite, or disposition to sleep than an animal usually does who has been the subject of an experiment which gives some pain, but does not injure the vital functions. A preparation made from this dog has been long preserved in the collection at St. Thomas's Hospital; and the parts have been injected to shew the principal vessels which carry on the circulation, which are the two thyroidal arteries, and two branches from each vertebral, passing under the angles of the lower jaw.

I was therefore resolved to take the first opportunity of repeating the operation before the disease...
had advanced so far as to interrupt, in a considerable degree, any other function than that of the passage of blood through the carotid artery; and my friend, Mr. George Young, surgeon, had the kindness to furnish me with a case of the most favourable nature, by sending, first to my house, and afterwards to Guy’s Hospital, a man who was in all respects the subject I should have chosen. He had a mind cool and firm, yet obedient to every injunction: a body equally unirritable as his mind — the tumour only about two inches and a half in diameter, and the neck of considerable length, so as to give ample space for exposing the carotid artery. The history of this case is as follows: —

HUMPHREY HUMPHREYS, aged fifty, who has been employed to carry loads of iron* as a porter, observed six or seven months ago, a tumour, having a pulsatory motion, and about the size of a walnut, on the left side of the neck, just under the angle of the jaw, and extending from thence downwards to the thyroid cartilage. It was accompanied with great pain on the left side of the head, which began about five months ago, and was attended with a sense of pulsatory motion in the brain. The tumour affected his speech, so as to make him extremely hoarse; and he had more recently a cough, attended with slight

* The employment consists in this: — A collar of wood is placed around the neck and upon the shoulders, and he carries bars of iron on each shoulder, thus protected.
difficulty of breathing, and which seemed to be the effect of the pressure of the swelling on the larynx. His appetite was sometimes affected by it; for three or four days he ate heartily, and then for many lost his relish for food. He had a sense of coldness succeeded by heat in his left ear, and he often became sick when eating, but did not vomit. Upon attempting to stoop at any time from that period, he had an insupportable feeling as if his head would burst; a giddiness; loss of sight; and almost total insensibility.

The left eye, which had for some time been gradually closing, appeared now not above half as large as the right; yet its power of vision was equally perfect.

A blister was at this time ordered to be applied on the head by Dr. Hamilton, which lessened his pain. A month ago he applied another with the same relief; but it lasted only for a few days. He continued at work until the day previous to the operation.

The dilatation of the carotid artery was seated just below the angle of the jaw, and about the acute angle which is made by the great division of the common carotid. The tumour was about the size of a pullet’s egg, and prominent in its middle.

The pulsation of the aneurism on the day of the
operation was remarkably strong; when the sac was emptied by pressure on the artery below, the tumour sprang to its original size with one contraction of the heart.

I proposed to tie the common carotid below the dilated part, and the operation was performed at one o'clock on the twenty-second of June 1808, at Guy's Hospital.

I began my incision opposite the middle of the thyroid cartilage from the base of the tumour, and extended it to within an inch of the clavicle, on the inner side of the mastoid muscle. On raising the margin of this muscle, the omo-hyoideus could be distinctly seen crossing the sheath of the vessels, and the nervus descendens noni was also exposed. I next separated the mastoid from the omo-hyoideus muscle, and the jugular vein became apparent, which being distended at every expiration spread itself over the artery. Drawing aside the vein, the par vagum was evident, lying between it and the carotid artery, but a little to its outer side. This nerve was easily avoided.

A blunt iron probe constructed for the purpose was then passed under the artery, carrying a double ligature with it. Two ligatures being thus conveyed under the artery the lower was immediately tied. I next detached the artery from the surrounding,
CAROTID ANEURISM.

parts, to the extent of an inch above the lower ligature, and then tied the upper. Lastly, a needle and thread were passed through the artery above one ligature and below the other. The division of the artery was then performed.

Nothing now remained but to dress the patient, and this was done by drawing the parts together, by adhesive straps, the ligatures hanging from each end of the wound, and by laying on a piece of lint retained by straps of adhesive plaster.

Mr. Vose, my dresser, (whose attention to the case was unremitted, and to whose care and knowledge many of my patients have been indebted for their recovery) now asked the patient if he experienced any unusual sensations about his head. He answered, that for the first time since two months after the formation of the tumour, he was relieved from a distressing pain which extended up the left temple, accompanied by a violent throbbing of all the arteries of that side. This pain never returned.

The pulsation in the tumour, however, had not entirely ceased, although it was so much diminished as to become obscure; but it was felt by my colleague, Mr. Forster, by Mr. George Young, Mr. Dubois, jun. from Paris, who accompanied Mr. Young, by Dr. de Souza, and many others who were present at the operation. I concluded it to be the effect of
the return of blood by the internal carotid artery from the brain, in consequence of the free anastomosis which exists between the blood-vessels within the skull.

The patient was put to bed, with his head elevated, and in this position he felt quite comfortable.

*Three p.m.* Pulse was moderate, skin cool, suffered very little pain. Pulsation in the tumour perceptible, but inconsiderable, when contrasted with its force before the vessel was tied.

*Five p.m.* Pulse stronger and fuller, but in other respects as before; head entirely free from pain.

*Eight p.m.* Patient's pulse reduced to the healthy standard, skin cool; says he feels no pain.

*June 23.*—*Six a.m.* Patient passed a good night.

*One p.m.* I saw the patient; he had a slight cough; has had no evacuation since the operation; pulse was not quicker than natural.

*Ten p.m.* The patient got out of bed, and went to the water-closet, and had an evacuation.

*June 24.*—*Six a.m.* Pulse natural; pulsation in
the tumour continues; tumour sore when compressed; has become firm, for the blood which was fluid in it prior to the operation and all yesterday is now coagulated; pain, and a sense of fulness felt on the right side of the head.

*June 25.*—*Six a. m.* Patient says he no longer feels pain in any part; has had a good night; has only one troublesome symptom, viz. an occasional rattling in the larynx from accumulated mucus; pulse this morning quite temperate.

*Three p. m.* The tumour is considerably diminished; pulse moderate; no constitutional irritation.

*June 26.*—*Eight a. m.* Patient had a good night; pulse still moderate; skin cool.

*Eleven p. m.* Still free from any disagreeable symptom.

*June 27.*—*Seven a. m.* Patient very restless during the night; coughed much and had pain in the head: spirits depressed; pulse natural.

*Half past one p. m.* Pulse eighty-four; feels much better than in the morning; has had an evacuation from the bowels since last night.

*June 28.*—*Seven a. m.* Pulse natural; had a tolerable night; bowels open; no pain.
CAROTID ANEURISM.

One p. m. I saw the patient; pulse eighty-four; slight pulsation still to be felt in the tumour, which is much diminished.

June 29. Pulse natural; no pain, pulsation still perceptible; tumour so much less that the skin is wrinkled over it.

June 30. Wound dressed the first time, and has united by the first intention as far as the ligatures would permit; he is free from irritation.

July 1. Pulse natural; man tranquil; pulsation very obscure; tumour firm; he is very hoarse.

July 2. No stool; ordered opening medicine; very hoarse, so as to speak only in a loud whisper.

July 3. Pulsation doubtful; man healthy.

July 4. Going on well.

July 5. Wound looks well; man appears natural; but the hoarseness continues.

July 6. He is free from any symptoms of irritation.

July 8. Patient says the tumour is now only half its size at the time of the operation.
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July 12. Ligatures projecting more; and much more discharge from the wound.

July 14. Upper ligature came away, being removed by Mr. Vose.

July 15. Lower ligature came away; pulsation very obscure.

July 17. Man walked out of his ward; the tumour at this period was reduced to less than half its size. The pulsation in it was with difficulty perceived; but it continued until the beginning of September, at which period all who saw him agreed that the pulsation had ceased, and the tumour was then scarcely apparent. The facial and temporal arteries on the left side cannot be felt.

The wound was a long time in healing, first from a sinus in the course of the ligatures, and afterwards from a fungus where the sinus had been placed.

The man was discharged cured, on the 14th day of September, and returned to the occupation of a porter at Crawshay's iron wharf; Thames-street.

The result of this case afforded me a degree of pleasure which compensated for the disappointment.
I felt in the issue of the former. In a professional point of view, it was highly desirable to ascertain the possibility of saving life in a case which had hitherto proved generally fatal; and I could not but feel more than common interest in the fate of a man, who, although he well knew that the trial was new, and the risk considerable, never betrayed the smallest signs of apprehension.

Near eight months have now elapsed since the operation was performed, and he has returned to his former employment without any diminution of his mental or corporeal powers, excepting the lessened action of the temporal and facial arteries on the side in which he was operated. The tumour has disappeared, and he has not been since subject to that pain in the head, by which he had been so much distressed prior to the operation.

This aneurism, from the depth of its situation, was, I believe, seated in the internal carotid artery, and this led me to hope that the regurgitation of the blood, although at first sufficient to produce a slight pulsation in the tumour, would not continue to support its growth, because as the internal carotid passes through a foramen in the skull, a little above the swelling, it could not dilate at that part to bring down any additional quantity of blood into the sac; so that its first effect was likely to be as great as any it could produce. But if the aneurism had been of the external carotid artery, owing to the number of
communicating vessels, I should not have been equally sanguine in my expectation that the pulsation would have ceased, as I have known two instances, one of a wounded radial artery, and the other of aneurism of the anterior tibial, in which the tumour continued to grow by anastomosis, after the arteries had been tied above the swellings.