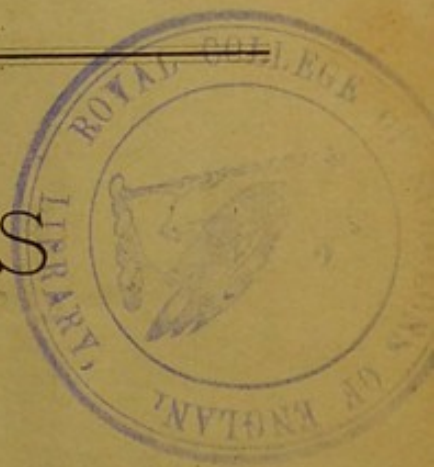
Ligations for the cure of aneurism / by L.C. Lane.



LIGATIONS

—FOR—

THE CURE OF ANEURISM.

By L. C. LANE, M.D., M.R.C.S.

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1863

The following cases of arterial ligation, done for the cure of aneurism, are submitted for publication:

FEMORAL ARTERY.

1. A grocer much addicted to beer, in 1863 presented himself for treatment for a large popliteal aneurism; aged 35, and of fat and plethoric habit. Femoral tied in the Hunterian site, with ordinary silk, one end of the thread escaping from the wound. Alcoholic dressing. Ligature detached about the nineteenth day, followed on the twentieth by a violent hemorrhage from the site of ligature. Bleeding repeatedly occurred, until, as a last resort, the thigh was amputated at its middle. Death, finally, from exhaustion.

2. Mulatto: subject of popliteal aneurism; had the femoral tied in the middle of the thigh. Ligature detached near the end of the third week, when, though the wound was unclosed, to cancel his surgical obligation, he fled the city. I learned afterwards that he was cured.

3. A saloon keeper of lymphatic temperament; aged 28; had the Hunterian ligation done for cure of a popliteal aneurism. Ligature detached on the seventeenth day; three days afterwards violent hemorrhage from the unhealed wound, which despite com-

pression, both proximal and distal, continued to recur, until, as a last refuge, the limb was amputated. Stump healed wholly, except that the ligature on the divided femoral remained until the fifty-fourth day, when it came away. Two days later, there was a severe bleeding from the sinus left by the ligature. The bleeding recurred at short intervals, until at the end of nine weeks after the amputation the man died from exhaustion.

4. A young man, aged 24, of very dissolute habits, was the subject of Hunterian ligation for the cure of a popliteal aneurism, caused by violent jumping. Two weeks after the ligation, there was a slight bleeding from the wound, induced by copulation. The ligature dropped a few days afterwards, followed by immediate and complete recovery.

5. Hunterian ligation for popliteal aneurism, in a man aged 40 years, who was the subject of general vascular atheroma. Silver metallic ligature was used, tied, and cut short. The wound healed immediately, and an early cure was promised, when, owing to coldness of the limb, hot bottles were applied, yet so incautiously used that the leg was badly burned; thence resulted gangrene, for which amputation was done, from the shock of which, with ichoremic complication, death resulted.

6. Hunterian ligation of the femoral, in a miner, for relief of popliteal aneurism. Silk ligature was used, in the passage of which the femoral vein was wounded and bled a few drops. There arose no ill from this mishap. The ligature dropped early, and in eight weeks there was complete recovery.

7. Hunterian ligation for the cure of a popliteal aneurism in a robust miner, aged 40. Patient was uncontrollable, frequently turning in bed. Complete recovery in ten weeks.

8. A baker, fat and plethoric, was the subject of Scarpa's ligation for the cure of a popliteal aneurism; ligation of the femoral just below Poupart's ligament. Secondary bleeding near the end of the third week, which for some days was restrained by proximal and distal mechanical compression; compression finally proving ineffectual the external iliac was tied. After this there was no hemorrhage, though the foot became gangrenous and was amputated. Recovery. Five years afterwards the man died from apoplexy.

9. Scarpa's ligation was done in a youth, aged 18, for the relief of a vascular growth, twelve inches long and three inches wide, on the anterior side of the thigh; aneurismal thrill and blowing sound were audible in all portions of the tumor. Secondary hemorrhage near the close of the third week, which was controlled by digital compression. That was continued for two weeks, when the wound had healed. The pressure was made by a single index on the proximal side of the wound. For some months the growth of the tumor was arrested; later, however, development was renewed, when successful coxo-femoral disarticulation was done. The tumor, which was sarcomatous in species, afterwards reappeared in the pelvis and ended the patient's life.

10. Patient aged 17 years, was the subject of arterio-venous aneurism, of traumatic origin, located in the upper and outer part of the lower leg, the fibular head marking the tumor's upper border. Hunterian ligation with carbolized silk, the ends being cut short. The wound, closed by metallic suture, healed in one week. Soon after the tying, the soft parts of the dorsum of the foot were the seat of stasis, and in a few days became gangrenous, the gangrene ultimately involving all the soft parts lodged in the anterior interosseous space. An amputation below the knee was followed a few days later by secondary bleeding ad deliquium animi. Re-amputation above the knee, with simultaneous transfusion of six ounces of defibrinated blood, introduced by means of a Dieulafoy aspirating syringe. So nearly was life extinct when the transfusion was done that the median cephalic vein, prepared for opening, remained collapsed and bloodless. Speedy improvement followed the introduction of the blood, after which the patient quickly recovered.

11. Was called to a noted charlatan of San Francisco, laboring under popliteal aneurism. The surface of the tumor was inflamed, of livid hue, threatening to rupture externally at an early day. To favor this event he was poulticing it, for the purpose, as he said, "of drawing it to a head." Femoral artery was tied below the profunda with carbolized silk, cut short, and wound closed. Recovery without suppuration in the tumor, though several points on the leg, of limited extent, became gangrenous, and were slow to heal.

EXTERNAL ILIAC ARTERY.

1. For the relief of an aneurism situated in the left femoral artery, just below Poupart's ligament, in a longshoreman, the external iliac artery was tied through a curved incision in the iliac fossa. The vessel was reached through the usual retro-peritoneal route, tied with silk, one end of the cord remaining external. Recovery, and return to his work in three months.

2. For a similar aneurism in an engineer, employed on the Columbia river, Oregon, similar ligation was done. Recovery.

3. For a large aneurism in the femoral artery, the dilatation involving the lower portion of the external iliac, in a farmer from Napa county, Cal., the external iliac was tied near its origin. Recovery.

4. In case number 8, above reported, of ligations for the cure of popliteal aneurism, the external iliac was successfully ligated.

5. In a glover, aged 40, of Alameda, Cal., a fusiform aneurism in the upper third of the femoral artery was treated for some months with direct mechanical pressure. This failing to cure, the external iliac was tied. Recovery.

6. A mechanic, aged 60, was the subject of aneurism involving the lower portion of the external iliac, and the upper part of the femoral. The external iliac was ligated high up; detachment of ligature at the end of four weeks. The man was the subject of urethral stricture, and on the day following the detachment of the ligature, while straining to urinate, secondary bleeding ensued. Later, another severe hemorrhage from the distal end, as shown by the fact, that proximal compression did not control it. An unsuccessful attempt was made to reach the bleeding ends for the purpose of re-ligating. Death at the end of six weeks from exhaustion.

7. Frenchman from Stanislaus county, aged 36, presented himself with a large aneurismal tumor, involving the upper part of the left femoral artery, and which reached as far up as Poupart's ligament. The external iliac was tied in its upper half with carbolized silken cord, cut short, and wound closed. Complete cure in four weeks, when the tumor was reduced to half its original volume.

SUBCLAVIAN ARTERY.

1. An engineer from a Sandwich Island plantation, was brought from the Islands in an ambulance litter, afflicted with aneurism involving the termination of the left subclavian and the entirety of the axillary artery. The tumor, large as a fetal head, had apparently only the cutis for external wall. Through a quadrangular cut, the flap being attached above, the subclavian was reached in its trans-scalene site, and tied close to the muscle. Ligature was of small silk, carbolized, ends cut short and wound closed. The wound healed in two weeks and recovery was complete in two months. To-day, eighteen months after the ligation, the man writes that the tumor has disappeared, his arm is restored, and he is doing his work as engineer.

2. A miner from Alaska, with similar aneurism, though one-third less in volume, had the left subclavian ligated similarly, except that the vessel was reached through a vertical cut. In one week, primary union of the wound. The man, of obstinate temper, near the end of the second week, though cautioned to maintain quiet, rose from his bed and used the close stool. A slight bleeding ensued through the re-opened wound; later, another violent bleeding occurred. On the fourteenth day the wound was opened, and, while the blood that gushed from the distal end was controlled by sponge used as a tampon, the artery was exposed by severing the sternal leg of the st. cl. mastoid muscle, and a thread thrown around the subclavian just as it emerges from the thorax. This so arrested bleeding that a ligature was passed around the vessel close to the aneurism on the proximal side. Though there was no more hemorrhage, and the vitality of the arm was well maintained, yet the man died from exhaustion on the nineteenth day after the first ligation. It should have been remarked that before this man came under my care, there had been made an unsuccessful attempt to cure him by indirect compression digitally applied, at the point where ligation was afterwards done.

DISTAL LIGATION FOR THE CURE OF INNOMINATE ANEURISM.

1. In a laborer, the subject of innominate aneurism, the subclavian for one-half its course being implicated, the latter vessel was ligated near its termination. Some relief from dyspnea was gained during the week that the man survived the operation.

2. In November, 1882, M. Laurent, Frenchman, applied for treatment for an innominate aneurism. The visible part of the tumor, large as a hen's egg, was encroaching on the jugular fossa, and the patient was harassed with cough and dyspnea, and could not utter more than three words coherently, without gasping for breath. He had last been treated by a *charlataness*, who, mistaking the tumor for an abscess, had tried to puncture it to "let out the matter," the unhealed mark of which remained when he came to me.

Eager to escape from his sufferings, he gladly accepted the proposal of ligation. To do this, anesthesia was twice attempted, yet he was so intolerant of it that he begged to be operated upon without chloroform. Besides, for some time, he had not been able to lie down, as the recumbent posture induced suffocation. Hence, yielding to his entreaties, the ligation was done as he sat in his chair. The subclavian was first tied, in its trans-scalene site; immediately afterwards the carotid was also tied below the omo-hyoid muscle. As immediate result the dyspnea was much lessened, so that with Gallic enthusiasm he announced himself much better, (*beaucoup mieux*). His cough also nearly disappeared.

Carbolized silk was here used, cut short, and the wound closed. Each wound speedily healed, though that for the carotid afterwards reopened and suppurated for a few days. No encephalic symptoms resulted from the tied carotid. In two months, pulsation had nearly vanished in the tumor, and the man had so recovered normal health that he resumed his former duties as a watchman. This work he continued for a number of weeks, when he began to be troubled with cough again. On examination, it was found that the subclavian branch of the innominate was dilating on the proximal side of the ligated point, and was inducing the wonted accompaniments of phrenic, pneumogastric and sympathetic irritation. This man lived nearly ten months after the operation, during a portion of which time, as said, he pursued his work as watchman.

Farabeuf, in his "Ligations," cites but six cases of simultaneous tying of the carotid and subclavian, all of which ended fatally in a few days.

AORTIC LIGATION.

A gardener presented himself with an aneurism in the upper portion of the abdominal aorta. Thrill and blowing sounds were present on the left side of the precordia; the same were perceptible behind and on the left side of the spine. The man had been confined to bed for nearly six months. For some weeks previous to my visit he had suffered great pain in the anterior and outer portion of the left thigh, doubtless due to pressure on the roots of the lumbar plexus. This pain had become so acute that existence was a burden, and the patient was ready to submit to any procedure which might offer a conjectural shadow of relief.

The annals of pathological anatomy containing numerous cases of gradual closure of the aorta with subsequent continuance of life, it seemed to the writer possible that Art following closely in Nature's footsteps, might reach the same end. With this view, (Brasdor's) distal ligation was decided upon, and done as follows: An incision was made in the median line, the navel being in the center of the cut. Owing to meteorism, the vessel could not be reached without allowing the intestines to escape. A sacculated aneurism umbelliferous in form was found arising from the aorta near the diaphragm. During arterial diastole, the tumor was thrust against the soft parts in which lies the lumbar plexus. The aortic sheath was seized between the superior and inferior mesenteric arteries, and the apex of the uplifted cone was severed obliquely, thus exposing the front wall of the vessel. Through the elliptical opening thus made the sheath on each side was carefully detached; through the route thus prepared, a medium sized carbolized silken thread was passed around the vessel, and so tied as to allow one-half of the interior calibre (lumen) to remain unclosed. The thread was knotted and cut short. The distended bowel was returned with extreme difficulty, a difficulty that can only be truly appreciated by the laparotomist who has operated for intestinal obstruction. After much forcible manipulation the bowel was restored to its cavity, and the parietal incision closed. Before the end of twenty-four hours peritonitis appeared and rapidly developed, ending the man's life on the third day.

Upon subsequent reflection I am convinced that had the patient been bled prior to the operation, the possibilities for his recovery

would have been much increased, for it would have relieved the blood-vessels of their surplus fluid, and have increased the fibroplastic element of the blood, thus, on the one hand, removing fuel for inflammation, and on the other, creating more material for the occluding clot.

By this new method of ligating, original with me, and which may be named that of *gradual occlusion*, the aortic canal was reduced at once to one-half its normal diameter; the femoral pulse was reduced to the volume of the radial, while that of the tibials was correspondingly diminished. The pulse at no time disappeared from the femoral arteries, and the lower limbs retained their normal sensation and temperature.

Necropsy showed that in the plicated constriction of the aorta, some coagulation had occurred, the small coagula being adherent in the crevices of the inner tunic. From the point of ligation to its bifurcation the aorta was found reduced to less than half its normal calibre; and the primitive iliacs were correspondingly lessened. The constricting ligature had caused no cutting in the wall of the vessel. Above the ligature the aorta was of normal size.

Though this case terminated unfortunately, yet enough was accomplished to justify its adoption in both distal and proximal ligation of the abdominal aorta; distally, for aneurism in the upper part, and proximally, for that in the lower portion, or in the primitive iliacs. The selection of the site of ligature between the mesenteric arteries ensures an ample vascular supply through the arcade of anastomosing trunks even though the aorta should become immediately occluded.

Too sanguine expectation usually accompanies each new procedure or innovation in surgical art, and experience becomes guarded in its predictions; yet when we remember that in the operation of gastrostomy, twenty-eight failures preceded the first successful one, and that innominate ligation defied our art for nearly a score of trials, then there is hope for this new mode of arterial closure, though failure has attended, and may again, attend the first essays of it.

The foregoing ligations were done during a surgical practice reaching through a period of twenty years; each one was witnessed by physicians yet living in California. In several of the cases, it

should have been remarked, that indirect compression had been unsuccessfully tried.

In the later ligations there was a radical departure from classic rule, in this, that no attempt was made to divide the inner and middle coats by tight tying; in fact, that was avoided, as contact of serosa with serosa suffices for ultimate adhesion. And this was rendered possible by the use of antiseptic cord, which could at once be cut short, and the wound closed. The period of healing is thus reduced to days, where weeks were formerly required, and the tedious waiting for the cord to drop becomes a thing of the past. And this new revision of this chapter of surgery is due to one man —Joseph Lister—upon whose ears the salutations of immortality have already fallen too often to be flattered by this tribute.