

Dr Watson on Varices

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AN INQUIRY

INTO

PATROLOGY AND TREATMENT OF FARISES

BY JOHN WATSON, M.D.

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AN INQUIRY

INTO THE

PATHOLOGY AND TREATMENT OF VARICES.

BY JOHN WATSON, M.D.

Surgeon to the New York Hospital.

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## AN INQUIRY, &c.

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To determine the safest and most effectual mode of curing varices, is a question that of late has excited much attention. Prior to the experiments of Sir Everard Home by the application of a ligature to the veins, the pathology of these vessels had only begun to excite attention. Since that period the subject has been more thoroughly investigated, and has led to greater caution in interfering with the affections now under consideration. But notwithstanding the unfavourable results that have so frequently marked the various modes of treating varices, those most familiar with the sufferings, dangers, and sometimes fatal consequences attending these diseases when allowed to progress, still look upon the question of their treatment as one of absorbing interest.

With a view to throw some further light upon this inquiry, it will be my object in this paper to offer some remarks upon the pathology of varices: to review in a summary way the various modes of treatment hitherto employed for the cure of them; and to give the details of the operative procedures to which I have myself resorted.

I shall pursue the subject in the order in which it has grown upon me; namely, by the study of individual cases.

*Part First.—Cases and Comments.* CASE I.—Mr. M., a teacher, about 30 years of age, came to the city from Orange county, to be cured of a troublesome varicose affection in his left leg, of several years duration; and of late so painful and annoying, as to prevent him from attending to his usual occupation.

The disease involved the whole of the great saphena, but was most marked in the internal saphena and its principal branches, many of which were excessively dilated, contorted, and nodulated.

The operation proposed by Dr. Stevens, with whom I saw the patient, and which he performed May 27th, 1839, was the sub-cutaneous division of the saphena major, just below the middle of the thigh. The vessel was raised with the integuments covering it, and divided from beneath outward, without wounding the skin except at the point of puncture. A compress and roller were afterwards applied, and the patient was directed to keep the limb at rest in the horizontal position.

*June 3d.* The dressings were removed for the first time. The wound had healed; there was still slight ecchymosis around it, but neither swelling nor inflammation. The varices, when the patient put his foot to the ground,

instantly reappeared, and were as well marked as before the operation; although perhaps not quite so large. *The course of the blood did not appear to be interrupted at the point of incision.* The edges of the wound in the vessel had in all probability united by adhesion, without obstructing its calibre; as they almost invariably do after ordinary venesection.

4th. The patient being anxious for more effectual relief, Dr. S. at my suggestion, performed the following operation:

An incision about an inch and a half long was carried through the skin, in the course of the vein, a few inches above the knee. After thus exposing the vessel it was raised on a probe and about half an inch of its calibre was excised. Free hemorrhage followed from both extremities of the cut. Slight pressure after a few moments put a permanent stop to the bleeding from the upper part of the vessel; that from the lower part was arrested by the application of a ligature. The edges of the wound were then drawn together by adhesive straps, and a compress and roller were applied as on the former occasion.

13th. The ligature came away; the wound was suppurating slightly; the surrounding parts were free from inflammation.

23d. The wound had cicatrised; the bandage was entirely removed. The varices appeared to be effaced, except at the inner and upper part of the leg, where the principal swellings had existed. The bandage was replaced, and the limb again put in the horizontal position.

28th. The patient returned to the country much relieved, but not entirely cured; the principal varix at the upper part of the leg being still apparent, and the blood filling the vessel even up to the level of the cicatrix.

I saw this patient several months after the operation. The varices had reappeared in all the branches of the internal saphena; but were less distended than they had formerly been, and gave him less uneasiness.

The first point established by this case is,—that the simple subcutaneous division of a varicose vein, is not a certain means of obstructing the passage of the blood through the vessel. This fact might, indeed, have been deduced from the results of ordinary phlebotomy. Every practitioner is aware that the arms of his patients may be marked by numerous cicatrices, the result of repeated venesection in the same vessel, and almost all at the same point, without diverting the current of the blood from its natural channel, or diminishing the calibre of the vein; although many of these lancet wounds may have been free in the division of integument, and of sufficient depth and extent to have completely divided the vessel; and all of them, as in this case, followed by compression.

The second deduction, and one perhaps of more importance, is that the excision of a considerable portion of a varicose vein, although it effectually interrupts the course of the blood at a given point, does not necessarily produce an obliteration of the vessel, either above or below that point; and is not a certain means of curing varices, either in the vessel itself, or in any of its branches.

CASE II.—Z. P. Esq., of Green county, N. Y., a gentleman about 56 years of age, tall and of spare habit, but accustomed to vigorous exercise, came to the city for advice on account of extensive varices in all the superfi-

cial veins of his right leg. Having in a measure failed to effect a cure in the foregoing case, it was not thought advisable to repeat the operation; and as the starched bandage was much in vogue about this period, and had recently been tried in a few similar cases at the Bellevue Hospital, I took occasion to try it on this patient. The leg was accordingly encased with a moderate degree of tightness in the starched apparatus, and the patient was directed to walk about as usual, and to allow the bandages to remain upon the limb as long as they would retain their proper position, provided they gave him no uneasiness.

I saw this gentleman about a year afterwards. He had worn the bandages about three months, during which time he had exercised much on foot, and had experienced much relief, and, as he said, comfort, in the use of the apparatus. But after its removal the varices were found to be as large and troublesome as ever. At this time he applied to me for advice on account of a pruriginous eruption with which he had been long affected, and which appeared to have some connection with the varices.

From the trial of the starched bandage in this case, I was induced to believe that, as a palliative measure, it possesses some advantages over the ordinary roller, as also over the military gaiter and laced stocking. When properly applied, the support rendered by this bandage is uniform; it is not readily disarranged, and may be worn without changing, for several weeks together.

CASE III.—Thomas Fitz Herbert, of Ireland, wire-worker, aged 40, was brought into the New York Hospital, late on the evening of May 17th, 1841, in a state of extreme exhaustion from loss of blood. He had long been subject to varicose veins, accompanied with an ulcer on one of his legs. While passing along Water street in the dark, he struck his diseased leg against a cellar door. The injury though slight in itself, gave rise to hemorrhage from one of the enlarged vessels; and before his friends had time to bring him to the Hospital, (no measures having previously been taken to arrest the discharge), he had lost so much blood as to be beyond the power of recovery. He died in a few minutes after admission.

The result of this case is sufficient to prove that varicose veins of the lower extremity constitute something more serious than "a trifling inconvenience;" and to justify the cautious and enlightened surgeon in further efforts to discover some certain mode of treating these affections, or to modify old modes in such a way as to render them more simple and efficacious.

CASE IV.—Mr. W., of Plainfield, N. J., hatter, aged 35, had for several years been troubled with an ulcer on his right shin, and a varicose state of the veins of the leg. On the 27th of May, 1841, he called upon me for advice. The integuments for some space around the sore were of a deep purplish hue almost black; the ulcer was small but irritable, and seated in the midst of an old cicatrix. The whole limb was somewhat swollen, and the external saphena, and its branches as low down as the foot, were enlarged, nodulated, tortuous, and painful to pressure: the internal saphena was unaffected. The varices were of more recent date than the ulcer, and appeared to have much influence in preventing it from healing. The disease

prevented the patient from pursuing his occupation, and he was anxious to submit to any treatment likely to afford him permanent relief.

I directed simple dressings to the ulcer, a roller to the limb, with repose in a horizontal position; and if at the end of a month the ulcer still persisted, I suggested the propriety of an operation upon the veins. The palliative treatment was pursued for the time specified, with little or no other effect than a slight diminution in the size of the ulcer. On the 17th of June I was summoned to Plainfield to perform the operation.

The patient being in a recumbent position, a fillet was applied around the lower part of the thigh for the purpose of rendering the vessels turgid. An incision about an inch and a half long was then made in the course of the external saphena, near the outer and lower edge of the popliteal space, with a small straight bistoury. After exposing the vein it was elevated on a probe, and thus left for the instant. A second incision was next made over a large branch of the same vessel, at an anastomosing point near the middle of the leg, and a probe inserted beneath the vein as at the first point. The same procedure was repeated on an enlarged vein just below the ulcer, above the ankle, at another point of anastomosis; and lastly, on a dilated vein upon the dorsum of the foot.

After thus completing the first steps of the operation, the fillet was removed. And while pressure was applied by the fingers of an assistant in the course of the vein, both above and below the last incision, with a pair of forceps I raised the vessel from the bottom of the wound, and with a pair of scissors removed about half an inch of its substance. No hemorrhage followed the excision of the vein. The same procedure was repeated on all the other portions of veins that had been exposed by the incisions, without giving rise to any bleeding. The edges of the wounds were then drawn carefully together by adhesive straps, and each wound covered with a compress. Finally, the whole limb was enveloped in a roller from the foot to the middle of the thigh. The patient was now directed to remain on his back for at least a week, and for the first twenty-four hours to be kept under the influence of anodynes. On the day following the operation, the roller, giving him no uneasiness, was coated with paste; and another roller placed over it, and also pasted, so as to render the whole dressing firm, and to prevent it from wrinkling.

The coats of the two uppermost pieces of vein that had been removed, were at least half a line in thickness. The inner tunic was of a pale flesh colour, and by the contraction of the vessel, thrown into longitudinal rugæ,—giving it the appearance of muscular fibre. The middle coat, more hypertrophied than the rest, was of a cartilaginous colour and consistence. The two lower pieces of vein, though dilated, were more nearly of a healthy structure; the inner lining, glossy and of its natural colour; the middle coat, sufficiently hypertrophied to prevent the vessel from collapsing.

No untoward symptoms followed the operation. The bandages were removed on the eighth day. The incisions had already united, the varices had been effaced, and the ulcer had cicatrised. To prevent a recurrence of the disease, before allowing the patient to use the limb, the starched bandages were reapplied. He continued to wear them while attending to his business, for nearly three months, and then left off every sort of dressing.

I last heard from this patient in April, 1842. He had had no return either of the ulcer or the varices; and the discolouration of the integuments around the cicatrix of the ulcer had nearly disappeared.

The treatment in the case now described being somewhat original; its

simplicity, its efficacy, and the promptness and durability of the cure, gave me considerable satisfaction; and determined me to pursue the operation, or to improve upon it in other cases. I had been led by reflection to its adoption after perusing the able memoir of M. Bonnet on the subject of varices, in which he undertakes to show that in order to their effectual cure, it is necessary in most cases, to interrupt the course of the blood through the diseased vessels, at numerous points along the limb. The suggestion is not new, inasmuch as it had been practised upon at least as early as the days of Celsus; and in modern times by Hunter, Brodie, Davat, and others. But it is of more importance than would appear from the writings of any of these authors; and M. Bonnet has presented it in a manner so forcible, as almost to deserve the credit of originating it.

Mr. Bonnet's modes of treatment in detail, however, I did not feel justified in imitating, sufficiently aware that there are serious objections against the pins and twisted sutures, as well as against the caustic, employed and recommended by this author, and that without having determined the fact by experiment, the operation by numerous excisions appeared to have many advantages over these.

In the first place it appeared to be more thorough and permanent in its effects; the pins as well as caustic often failing to obliterate the vessel, or to obliterate it permanently; and sometimes even failing to embrace it. Secondly, the immediate effects of the operation by excision did not appear likely to be serious, or attended with much pain; the wound usually healing by adhesion, or after slight suppuration. Whereas, by the other methods, sloughing and ulceration are necessary consequences. Thirdly, the cure appeared to be more rapid. Fourthly, by leaving the vessel in the same condition as after amputation or other ordinary operations involving a division of the veins; the process of excision, although it furnishes no immunity against either suppurative or erratic phlebitis, must almost of necessity be less frequently the cause of such accidents.

CASE V.—William Sutherland, of Canada, boatman, aged 21, was admitted into the New York Hospital, May 5th, 1842, with an ulcer about as large as a dollar on his left leg, produced three years previously by an injury; and with a varicose condition of the internal saphena and its principal branches, on the same leg, existing two years.

After admission he was kept in bed, with simple dressings to the sore and a roller over the whole limb, for about two weeks; by which time the ulcer had cicatrised. On the 21st of May he underwent an operation for the cure of the varices.

The steps of the operation were the same as those detailed in case fourth. The veins were exposed, and the excision of a portion of the vessels was effected at four different points, commencing just below the knee, and proceeding downward, as in the former case. The principal peculiarities met with in this instance, independent of the loss of blood to the amount, perhaps, of ten or twelve ounces, were, first, that the veins lay deeper and were covered with a much denser layer of fascia; second, that at the upper-

most incision, in the course of the internal saphena, there was a concomitant vein lying over the principal one, that this smaller vessel was first exposed and taken for the main trunk; and that the principal vessel was separated from it by a very dense fascia, and was not exposed until after the division of the concomitant vein. The coats of all the vessels were found to be even thicker than in the foregoing case; and their inner lining was also corrugated longitudinally, and redder than natural.

The mode of dressing the wounds after the operation, and the subsequent treatment of the case, were in all respects the same as in the other case. The bandages were not disturbed until the end of the second week. On removing them we found the patient's limb free from varices, and all the wounds united by adhesion. In a day or two afterwards the bandages were reapplied, and the patient was allowed to walk about. There was no appearance of any return of the disease at the date of his discharge, June 19th.

Any attempt to treat the foregoing case either by the use of pins or of caustic, must, as appears to me, almost of necessity have failed; first, from the fact that the internal saphena lay so deeply as not to have been readily discovered, and much less reached by either of these means; and secondly, from the fact that the concomitant vein which lay above it, and was at first mistaken for it, if obliterated by either of these modes of treatment, would have a tendency rather to increase than to diminish the amount of blood circulating through the principal vessel, and thus to aggravate the disease rather than to cure it.

CASE VI.—Catharine Fitzgerald, of Ireland, a cook, single, aged 46, was admitted in the New York Hospital, March 5th, 1842, with numerous varices on both legs, but much the worst on the left leg. The disease was attended with an œdematous condition of both limbs, and involved the smaller as well as the larger vessels. The minute veins of the integuments were in numerous patches so much dilated as to render the surface purplish and arborescent. The disease had existed about five years. In consequence of the œdema and the burning and heavy sensation in the limbs when she remained standing for any length of time, she was unable to attend to her occupation. Her countenance was sallow, she was of a lymphatic temperament; and on closer examination I ascertained that for some months past she had suffered from a too frequent and profuse menstrual discharge, her periods returning upon her at the end of every second week.

Deeming the case, from this circumstance, an improper one for surgical interference, I directed her to be transferred to the medical department of the Hospital. Here under an appropriate course of treatment, (of which, however, I have no minutes), she was relieved of this difficulty; and about the first of May, she returned to the surgical department, to be relieved of her varices.

The operation was performed on the 21st of May, on the same day as in the preceding case. There were five different incisions, two of which were on the external saphena and its branches, and three on the internal saphena and the vessels going from it, at their anastomosing points; all of them below the knee. The veins, though much dilated, were not so much hypertrophied as in either of the former cases, and their inner lining was smooth and of its natural appearance. They lay immediately beneath the skin, imbedded in adipose tissue, and without the dense fibres or cellular coverings

described in the former case. The patient lost little or no blood during the operation. The subsequent treatment was as before described. That is to say, the patient, in order to allay the pain of the incision, and to prevent constitutional excitement, was kept for the first twenty-four hours, under the influence of anodynes. About the fourth day, the patient having hitherto been free from pain or excitement, a small circumscribed swelling was observed about the middle of the thigh, attended with slight pain and redness, and lying in the course of the saphena major. A blister was applied over this; and after a dose of castor oil had operated, the patient was again put upon the use of anodynes. No further inconvenience ensued, the swelling gradually subsided, but left an indurated spot which continued for some weeks.

The bandages were removed, and the incisions found to be cicatrised, at the close of the second week. The varices were now no longer visible, except that a few of the cutaneous venules were still apparent, giving to the skin the arborescent appearance already noticed. The bandage was again applied, and the patient allowed to use the limb. She remained in the hospital up to the 16th of July, using the limb every day without any disposition to a return of the disease. She would have submitted to an operation in the vessels of the other limb, had I thought the severity of the disease there sufficient to have required it.

The main peculiarities of this case were, that both the internal and external saphena and their branches were involved; and that this circumstance, contrary to the opinion of Bonnet, gave rise to no inconvenience. Other circumstances more or less worthy of notice, were that the limb was free from ulceration; that vast numbers of minute venules in all parts of the leg and foot, were proportionally as much dilated as the principal vessels, if not more so; that though tortuous, lengthened, and dilated, the vessels were not proportionally thickened, their coats having apparently suffered from simple passive enlargement. From the number of vessels involved, and from the extension of the disease to the ultimate branches of the veins, the operation was undertaken with less confidence of ultimate success, than the result of the case would have justified.

CASE VII.—Michael Neale, of Ireland, seaman, aged 29, was admitted June 21st, 1842, with a small ulcer on each shin, and varices on both legs. He stated that about five years previous, while in the East Indies, he had been confined to his bed by sickness for several months; after which, in attempting to walk, his limbs became swollen, and the varices soon afterwards appeared. Those on the left leg having been the largest from the first, were the first to give rise to ulceration. The ulcer on the other leg had existed about three years. Both of these sores had several times cicatrised and as often reappeared. Soon after the first occurrence of the varices on the left leg, an attempt was made to cure them by a deep longitudinal incision through the diseased veins near the upper part of the leg. The wound gave issue to very free hemorrhage, which returned every time the patient put his foot to the ground, for several days subsequently; but had no effect in diminishing the disease. Both legs have ever since continued swollen; the varices are gradually enlarging. The distress attending these frequently obliges him to remain on his back, and neglect his business,

After his admission he was for a few days confined to his bed, with simple dressings to the sore, and a roller over each leg; and with laxatives and low diet to relieve any inflammatory tendency, and prepare him for the operation.

On the 25th of June, the operation was performed on his left leg. The varices were so numerous as to require nine different incisions; one of which was on the saphena major, a few inches above the knee, five upon the internal saphena, between the knee and ankle; and three upon the external saphena and its branches, or the communicating vessels between it and the internal saphena, at their points of anastomosis. The veins though much dilated, were not generally as thick as usual; but in this respect they varied at the different points of incision.

No unpleasant symptoms occurred. The dressings were removed at the end of the second week. The ulcer had healed and all the cuts but two had united by the first intention; and these two cicatrised soon afterwards.

On the 20th of July, the disease in the left limb having been effectually cured, the patient underwent another operation on account of the varices on the right leg, the ulcer there having already disappeared. Three incisions only were required, all of them below the knee, the first in the internal saphena, the second on a branch of this, and the last on a mesh of varices at the posterior and lower part of the leg, in one of the main branches of the external saphena.

At the end of a week the dressings were removed; the wounds had united, and the varices had disappeared. The patient was discharged, cured, August 9th.

The most striking peculiarity of this case is, that in operating on the right limb, while attempting to pass the probe beneath the vein at the bottom of the second incision, the vessel was found in close contact with a cutaneous nerve of considerable size, which was indeed at first mistaken for the vein itself. The probe having passed beneath this, gave so much pain along the whole limb and down as far as the toes, that the mistake was at once detected. In detaching the vein some caution was necessary to prevent this nerve from being injured. A similar complication by almost every other mode of operation, whether by subcutaneous section, by pins, or by caustic, might have led to serious consequences; whereas, by exposing the vessel, as in the mode described, the nerve may be avoided with scarcely any risk of danger.

The other points of interest in this case, are—1st, the great number of incisions necessary in the first operation; and 2d, the interception of the blood through both the external and internal saphenas, in both limbs.

CASE VIII.—Mrs. Cahill, widow, a native of Ireland, aged 40, a washerwoman of full habit, but in feeble health; had suffered from extensive varices for six years, which, as she thinks, were originally caused by hard work. In June, 1838, she first came under my care, having at that time had several severe hemorrhages from a small ulcerated spot just below the knee on the left leg. The bleeding had recurred every day for eight or ten days in succession, and had reduced her excessively. Having no means of treating her conveniently elsewhere, I had her transferred to the hospital. On the evening of her admission, whilst in bed, and with a bandage on the limb, the hemorrhage started anew, and before the nurse had time to summon the

house surgeon, the patient had lost, according to the reckoning of those about her, at least two chamber-potfuls of blood. A pin was immediately passed transversely beneath the bleeding vein at the point of ulceration, and compression effected by means of a thread, adhesive straps, a compress and roller. The limb was kept elevated for several days afterwards. The wound healed; there was no recurrence of hemorrhage from this point; and the patient in a week or ten days left the hospital, with the varicose condition of her limbs as bad as at the time of her admission.

In August, 1841, she had a return of hemorrhage from another minute point of ulceration at the upper and outer part of the right leg. This was arrested by compression, aided by a few days repose in bed. From that period up to the 13th of August, she had no return of bleeding; but the varices were continually increasing, giving her much pain, causing her feet and legs to swell, frequently preventing her from attending to her work, and oftentimes confining her to her bed.

She called upon me, much alarmed, on the morning of the 15th of August, 1842, stating that on the night of the 13th, while engaged in ironing clothes, one of the diseased veins near the outer ankle of the right limb suddenly burst with so much force as to throw the blood to the distance of several feet from her, and that before it was arrested she had lost at least a quart. I found the veins in both limbs exceedingly enlarged; but those on the right leg, in respect to the number and size of the varices, in a worse condition than I had ever before witnessed, presenting by their elevations and numerous convolutions, the appearance of a cluster of small snakes winding around the limb in all directions. The enlargement and varicose convolutions extended throughout the whole length of the saphena major, involved all the superficial veins of the leg—and probably many of the venules in the subcutaneous cellular tissue, as well as in the skin. The irritation of the varices had excited a chronic pruriginous papular eruption, which formed large patches on different parts of the legs, but most extensive about the feet and ankles. She had often attempted to wear a bandage on the limbs; but, as she stated, it caused the veins to swell and to become very hard and painful, so that of late she has not ventured to use it. For some days prior to each recurrence of hemorrhage, she had observed a small red sore spot over the vein from which the bleeding at length issued. The point from which the last bleeding issued was not larger than a pin's head, and had already ceased to be swollen or inflamed. I applied a compress over this part, and secured it with a roller, which was carried over the whole leg as tightly as the sensitive integument would bear it. On her way home, the pain of walking obliged her to rest at the house of a friend; and while there the blood again started with violence from the same point. The loss of blood at this time was greater than at any former period, and was arrested by the syncope which it induced. I saw her in the course of the afternoon. She was still in a state bordering on syncope. The varicose enlargement had to all appearance been entirely effaced by the bleeding. The compress and roller were again adjusted. A slight oozing again occurred during the night. On the following morning she was admitted into the hospital.

In a few days after admission, she complained of nausea, loss of appetite, and slight headache, and was somewhat depressed in spirits. She was confined to her bed, and put on low diet and laxative medicine. The cathartic, however, rather aggravated her symptoms, irritated her stomach and bowels, and excited vomiting. These unpleasant feelings were relieved by small doses of Dover's powder. She could not at first bear much pressure on the

right leg—the veins being somewhat tender. An evaporating lotion was applied to them, which relieved the soreness.

On the 20th of August, her unpleasant symptoms having subsided, (although her tongue was pale and glossy, and her spirits still somewhat depressed,) the operation was performed on the right leg. Seven sections were necessary; one of which was on the saphena major, just above the knee; all the rest were on the internal saphena and its branches, the lowest of them being just above the inner ankle, in a mass of varices with which the small vein that had given issue to the recent hemorrhages communicated, by winding from below the outer ankle upwards and backwards, behind the tendo Achillis.

The vessels were unusually thin, and when once exposed and separated from their cellular attachments, they suddenly contracted, apparently to their natural size. In consequence of their tenuity, much caution was necessary to prevent them from being injured before isolating them. One of them was in fact perforated with a director by one of my colleagues, in attempting to pass the instrument under a thin layer of fascia which I was about to divide. At the bottom of one of the incisions, after passing the probe beneath a superficial vein, it was found that several other veins, still larger, lay somewhat deeper, and were yet covered by dense cellular tissue. This was divided, and these deeper veins lying immediately upon the sheath of the muscles, were taken upon the probe with the other, and in due time divided. The dressings and treatment immediately after the operation, were the same as in former cases.

About seven hours afterwards the patient became somewhat feverish, with headache, nausea, disposition to vomit, with pains in her back and lower part of the bowels. Her pulse was slow, however, and the appearance of her tongue as before the operation. A small dose of solut. sulph. morph. was administered and followed occasionally through the night with effervescent mixture. The excitement was somewhat increased on the two following days; but it was soon ascertained that the patient's menses had appeared immediately after the operation, and her state of excitement was attributed to that circumstance.

On the 23d the febrile symptoms had mostly subsided, but the patient had some soreness in the limb. The bandages were at first loosened, and at the end of a week entirely removed. Some of the incisions had closed by adhesion, one or two were suppurating slightly; but two of them had become more inflamed than usual, and threatened to excite severe inflammation in the loose cellular tissue of the calf of the leg. One or two small abscesses did in fact appear. At the close of the second week, the inflammation had entirely disappeared, and in the course of a few days afterwards, all the incisions had healed, and the patient resumed the use of the limb entirely free from varices except in the venules of the skin. But some of the convolutions of the veins were still visible by their bluish colour. She was discharged cured of the disease in the right limb, Sept. 16th, 1842. The patient was anxious to undergo the operation for the cure of the disease in the other leg, but the state of her family at home required her presence, and she was obliged to leave.

The peculiarities of this case are—the number and extent of the varices; their complication with a pruriginous eruption; the frequency and alarming severity of the hemorrhages; the thinness of the coats of the vessels and their marked disposition to contract the calibre of the veins after being ex-

posed and detached from their cellular envelopes; and finally, the febrile symptoms and suppurative inflammation, following the operation.

Thus far the operation by repeated exsections had been attended with uniform and marked success. Before proceeding to relate my two remaining cases, which terminated unfavourably, I shall offer some observations on the most striking peculiarities of six others, in which the operation was seven times performed by my colleagues; all with complete success.

CASE IX.—On the 7th of June, 1842, Dr. J. Kearney Rodgers operated on a patient, making six exsections in the course of the internal saphena and its branches, either over large varicose masses, or at distinct anastomosing points. His mode of operating consisted in cutting boldly down upon the veins, and removing portions of them, without previously elevating them on a probe, and finishing the exsection at one point before commencing the incisions at the points below. This method has the advantage of being more expeditious than the other; but, on the contrary, it exposes the patient to a greater loss of blood.

In this case the disease had existed six years, and was complicated with a chronic ulcer. The patient, a currier, aged 24, had been operated upon about three years previously, by a physician in Connecticut, who applied a ligature upon the saphena major about one-third way up the thigh. The ligature was cut away on the fifth day: the wound healed by suppuration, and as soon as he began again to use the limb the varices were found to be as large and troublesome as ever. About a year after this he submitted to a second operation in the Massachusetts Hospital. Here caustic potassa was applied along the course of the vessel, on the skin, just below the point of the first operation. The result of this second operation was as ineffectual as that of the first. The vessel appeared to be as large and full at the point of the primary ligature as at any other place, and, as far as I could judge, the caustic had not produced an eschar of sufficient depth to reach the vein at all.

After the third operation, the limb was dressed as before described; no unpleasant symptoms ensued. The bandages were removed at the close of the second week, by which time the ulcer had closed; the varices had disappeared; almost all the incisions had cicatrised; one or two remaining open a few days longer. The patient was discharged cured on the 1st of July.

On the 23d of June, Dr. R. operated on two other cases. The first of these,

CASE X., was an Irish porter, aged 38, who was brought to the hospital in a state of insensibility, and sinking from sudden and profuse flow of blood. The point from which the blood had issued was a small indurated and elevated ulcer over a varicose vein, at the upper and inner part of the leg. About seven years previously he had had a similar bleeding from a ruptured varix near the same point; and about two years ago a second bleeding from an ulcerated spot similar to the present. The first attack came on soon after heavy lifting; the second whilst he was getting out of bed in the morning; and this last, in which the loss of blood was more profuse than in either of the others, came on whilst he was descending a flight of stairs. The varices had existed many years; were originally caused by hard labour. He had never had any large ulcer on the leg, and no other

sore than the small indurations that occur over the varicose swellings, and from which, by sudden giving way of the skin at a very minute point, all the hemorrhagies have issued.

In this case there were seven incisions made in the internal saphena and its branches, and about an inch of the vein removed from each. The bandages were removed at the end of a fortnight, by which time the cure had been effected. The patient was discharged on the 26th of July.

CASE XI.—Dr. R.'s third case had been several months in the hospital under treatment for varicose ulcers on both legs. The ulcers had preceded the varices, and these had existed about two years; and were worse on the left leg, whence they extended to the common saphena. The superficial epigastric vein on the right side was also slightly varicose. The ulcers had nearly healed at the time of the operation, which was performed only on the left leg. Four incisions were necessary, all on the internal saphena: three above and one below the ulcer. The progress and result in this case were the same as in the foregoing instance. The patient was discharged, cured, on the 25th of July.

On minute examination of the excised portions of veins in these two cases, I found them contorted, nodulated, and dilated, as usual. Their coats irregularly hypertrophied, were at some places nearly the tenth of an inch thick, and the outer coat in various points almost as hard as cartilage. The inner coat was corrugated into longitudinal folds of a pale pinkish colour, which changed after a few minutes exposure to a deeper red, giving the corrugated surface the appearance of muscular fibre. The valves were neither thickened nor irregular; so far as I could judge, they appeared to be perfectly healthy. Besides the longitudinally folded appearance of the inner coat, there were also numerous transverse folds involving all the coats of the vessels, puckering them and throwing their sides into little pouches and irregular convolutions, which could not be effaced or straightened out, even after the vessels had been separated from the dense cellular bands on their outer surfaces that appeared to hold them in these irregular positions. The coats of the vein at the concave side of these convolutions, were usually thicker and harder than at other parts. These morbid appearances in the vessels, as well as in their cellular investments, appeared to have been the result of chronic inflammation. The vessels, after their removal and longitudinal division, appeared to contract considerably in their transverse measurement.

CASE XII.—On the 23d of July, 1842, Dr. Hoffman operated on the right leg of a patient for the cure of varices complicated with an ulcer and with a chronic eczematous eruption, the result of the varices. The patient lost considerable blood. There were four points of incision; three on the inner saphena and its branches, and one on the outer. The dressings were removed on the 9th day: all the cuts, with one exception, had then been cicatrised and the varices had disappeared.

CASE XIII.—In this patient, (a German seaman of middle age and good general health,) Dr. Buck operated on both legs: on the right leg, August 18th, 1842; and on the left, September the 17th, following. The varices were so prominent on the right leg, as to enable the operator to dispense

with the use of the fillet around the lower part of the thigh. Seven incisions were necessary over the internal saphena and its branches. Subsequent to the operation, the patient had an attack of inflammation of the absorbents along the thigh, which soon subsided; but in the progress of the case he had considerable inflammatory reaction, and several of the incisions suppurated. In the second operation, (which was not performed until all the former cuts had closed and the patient was able to walk about,) there were four incisions: three on the internal saphena and its branches, one on the external. In the upper cuts on the former vessel, great masses of varices were exposed and found to be so convoluted and concatenated as to render the isolation of a single convolution less easy than the removal of the mass. No unpleasant symptoms followed this operation. The cure on both limbs was effectual.

In this case the disease had existed since boyhood. The varices were of an enormous size, so much so, especially on the left leg, as to render the limb deformed. He had for years been subject to small indolent ulcers on different parts of his legs, usually in the course of the veins. At the time of the first operation his limb was studded with several small indurated swellings in a state of chronic inflammation, with dark spots in the centre, like the eschars resulting from dry gangrene, and these were seated in the integuments immediately covering varices more tender than the rest, and apparently adhering to the skin. The convolutions at some of the points of incision were so short as to give the veins the spiral and twisted appearance of a cork-screw. The veins in the right leg were much thicker and more numerous and convoluted than in the left. When divided their coats were found to be nearly the eighth of an inch thick, uniformly hypertrophied and free from nodules: their inner coat presenting the appearance of pale and dense muscular fibres running longitudinally; and transverse ridges and depressions extending through both coats as in former cases. The valves of the veins were healthy. The fascia investing the vessels and binding the convolutions to one another, was very thick and strong, and appeared to be the result of long continued chronic inflammation in the cellular investment of the vessels, by which it had been contracted and consolidated.

CASE XIV.—This was a patient with a chronic ulcer in the leg, which had given rise to varices in the course of the limb. The operation for the cure of these was performed as before described, by Dr. Cheesman. The vessels were divided at four different points. In consequence of undue tension of the bandages, it was found necessary to remove them on the third or fourth day. The cure was as rapid and effectual as in the preceding cases.

CASE XV.—Susan Hyde, a negro woman, aged 33, a servant, was sent to me by a medical friend on account of varices on her right leg. The disease had existed five years. In the interval she had had a chronic ulcer on the shin of the same leg, which is now cicatrised; had suffered from an attack of bilious fever, and within the past year, from what was supposed to

be a disease of the liver. But, although somewhat emaciated, she stated that she had recently enjoyed tolerable health. On the 9th of September I had her admitted into the Hospital. After a few days preparatory treatment she appeared to be in a favourable condition for the operation, which was performed on the 15th.

A small ulcerated spot from which the hemorrhage had issued, as she stated, had first become sore about a month before admission, in consequence of a slight blow. It was seated in front of the ankle, on one of the terminal branches of the internal saphena. Just before the hemorrhages occurred she had suffered very acute pain in this part; the pain appeared to extend in the course of the veins all the way up to the thigh, and was followed by a sudden rupture of the vein at the point already mentioned, and the immediate loss of at least a pint of blood. A second hemorrhage occurred in three or four days afterwards, whilst she was in a recumbent position, and was much more profuse than the first. When I first saw her the varices were very numerous, and the veins greatly enlarged; but in consequence of the repose of the limb and the pressure of the bandage, at the time of the operation, they were greatly reduced so that the main trunk of the saphena in the thigh, and its continuation on the inner side of the knee downwards to the ankle, were the only vessels prominent beneath the skin. These to the finger were exceedingly resisting, and appeared to be consolidated. The application of the fillet was unnecessary, except for raising the vein at the lowest incision, and then it was applied around the leg just above this. There were but three incisions made, all of them on the main track of the internal saphena between the knee and ankle. The operation gave rise to scarcely sufficient hemorrhage to stain the instruments. About half an inch of the vein was removed at each incision, the last of which was at two inches above the point of ulceration. The vessels were absolutely empty, very much thickened, the inner coat corrugated as usual, and the calibre so contracted before the division, as scarcely to have admitted the smallest probe.

*Sept. 16th.* Patient had passed a comfortable night, and was still somewhat under the influence of the anodynes which she had taken subsequent to the operation. Skin warm, pulse 120. The pain in the leg caused by the incisions had nearly subsided. No tension or tenderness either of the foot or of the thigh, above the bandage.

*17th.* The anodyne taken last night had not procured her much sleep. Her tongue was thickly coated, and rather broad and swollen; pulse 140, small and rather weak. Had recently taken a dose of castor oil, which was still operating. She complains of thirst, and has no desire for food. No tenderness in the limb. She was permitted to drink weak lemonade. To-day for the first time, the starched bandage was applied over the simple roller. During its application she had some chilliness, which was attributed to the cool air from an open window near her, and was very transient. An anodyne was administered at night, consisting, as usual, of the solution of the sulphate of morphia, *gtt. xxx.*

*18th.* Had passed a watchful night without pain. Her general condition precisely as on the preceding day, except that there was some œdema of the foot, which when pressed was found to be rather tender; she spoke of a slight headache. The frequency of the pulse was the only symptom that appeared to indicate much constitutional excitement. I questioned her closely in respect to her history and previous state of health, but could elicit

nothing further from her than that her last menstrual period had just passed at the time of her admission into the Hospital; and that she had long been habituated to the use of opiates. The tenderness of the foot appeared to be caused by the tightness of the bandage. This was divided for a few inches upwards, and a looser one applied on the part. In the afternoon the patient had a rigor, which was followed by increased tension of the limb. The whole of the bandage was now divided, and a looser one applied. In the afternoon and until bed-time, the nurse informed me the patient appeared to be more comfortable than at any period within the two or three days past; but about midnight she began to moan and appeared to be in considerable pain. About 3 o'clock in the morning, supposing the patient required her assistance, the nurse arose, and to her surprise found her in a state of collapse. The house-surgeon was instantly summoned. He had scarcely time to see the patient, and administer a few tea-spoonfuls of brandy, before she expired.

*Post mortem examination*, between eight and nine hours after death. The body was rather emaciated; the parietes of the abdomen corrugated as if by utero-gestation. The upper incision of the leg was in process of union by adhesion; but the two lower cuts were gaping and filled with dark fluid blood. The integuments for an inch or two around them, appeared to have been in a state of gangrenous inflammation, the cuticle being detached from the skin. The cellular tissue of the foot was partially infiltrated with serum, and the veins below the last cut were filled with dark fluid blood, and free from coagula. The portion of vein between the two lower cuts, which were perhaps three or four inches apart, was the only part of the venous system that appeared to be at all inflamed, being of a brighter red colour than the fluid blood contained in it; but free from coagulum, and from every thing like fibrinous or purulent deposits. Above the middle incision, the internal saphena vein was empty, and of the same colour as the small sections that were removed during life. There had existed a very large mass of varicose contortions in the saphena major at its upper third. The vein here was also found of a deeper colour than usual, being of a dingy brownish purple; and its inner coat had the muscular appearance so often noticed in other cases during life; but gave no unequivocal evidences of recent inflammation. The inner coat of the vessel throughout was hypertrophied, and could be raised in large strips from the outer coat, to which, however, it adhered rather firmly, and when raised and examined, did not appear vascular. The large veins between this point and the heart gave no evidence of disease whatever, except that they had assumed, probably by imbibition, the precise shade of the dark fluid blood contained in them. The only coagulum found in the veins, was a small mass in the external iliac vein, which did not adhere to the coats of the vessel. The inner lining of all the large veins was perfectly smooth and elastic, and all the valves were healthy.

The heart presented no morbid appearances, with the exception of a fibrinous polypus, which extended from the right ventricle into the pulmonary artery. The upper lobe of both lungs was consolidated, and studded with numerous tuberculous deposits, mostly small. Some of these had degenerated into bone; and some of these bony tubercles were as large as peas; all of them of an irregular shape, and extremely hard. The right lung adhered firmly to the chest. The lower lobes of both lungs were free from tubercles, but were somewhat injected with mucus. In the midst of the tuberculous masses of the left lung there were two small deposits of laudable

pus; in all amounting to about half a tea-spoonful; probably the result of a softening tubercle. There was an old cicatrix on the surface and near the upper extremity of the right lung.

The liver was nearly twice as large as natural, and congested with fluid blood; as were all the large veins in its neighbourhood. The texture of the liver did not appear to be abnormal, either in colour or consistence.

The vagina was filled with a sero-purulent fluid, which issued from it in profusion in the attempt to separate the uterus from it. The uterus itself appeared to be larger and heavier than natural. There was a small fibrous tumour projecting from its fundus. The uterine veins were numerous, dilated, and convoluted, as in ordinary varices. The left ovary was as large as a hen's egg, and had degenerated into numerous cysts, which, when opened on the following day, were found filled, some of them with a transparent yellowish gelatinous fluid, others with what appeared to be grumous blood coagulated. The inner surface of the uterus, when laid open on the following day, was found to have been in a state of inflammation. Its mucous lining was of a bright red colour, extremely vascular; the vascularity greatest at the fundus, and at the openings of the Fallopian tubes; and terminating below, within half an inch of the neck, in a small projecting vascular growth, like an incipient polypus, about as large as a pea. The os tinæ was puckered, fissured, and slightly gaping; and there was an old cicatrix just external to it, round, about a quarter of an inch in diameter, probably the result of a chancre long since healed. No other morbid appearances were detected.

From the foregoing history it is evident that this patient must have concealed some of her symptoms prior to the operation, a circumstance by no means unusual in hospital practice; when, partly from the ignorance and inattention of the patients to their own feelings, and sometimes from a desire to deceive, we are often forced to draw our conclusions, both as to the nature and the causes of disease, rather from what we should expect, than from what we ascertain.

The most striking features of this unfortunate case then are,—a vitiated condition of the general health prior to entering the hospital, consisting in tuberculous deposits in the lungs, probably of long duration; an enlargement of the liver, also of long continuance; an inflammatory disease of the uterus, of recent date. Upon which supervened, after a trifling and almost bloodless operation, obscure febrile movements, characterised principally by a rapid feeble pulse, with heavily coated tongue, wakefulness, anorexia, and slight headache, which, after continuing for three days and a half, were suddenly followed by collapse, terminating in death; the fatal issue probably hastened, if not actually induced, by the formation of a fibrinous concretion in the heart, which must have materially interfered with the circulation through the pulmonary artery. The blood in most of the large vessels was in a fluid state; neither of the wounds had suppurated, and there were no evidences of phlebitis, except in a small portion of the internal saphena between the two lower incisions, which must have prevented the blood in this part of the vein from entering the general circulation.

CASE XVI.—Thomas Donahoe, of Ireland, a labourer, aged 30, was admitted into the N. Y. Hospital, August 30th, 1842, with extensive varices on the left leg and thigh, existing ten years, and a chronic ulcer on the shin existing six years. For the last few years the disease had troubled him so much that he was obliged to remain idle about half the time. He was of a sanguine temperament, had since his youth been subject to frequent attacks of epistaxis, and at the time of admission was somewhat plethoric, but was otherwise apparently healthy.

The saphena major, from the groin downward, was very prominent, about as broad as the patient's thumb, and the whole of its lower third thrown into irregular serpentine convolutions. Below the knee the varices were still more prominent, involving all the branches of the internal saphena, the main trunk of the external saphena, and numerous communicating veins, above and below the patella, as well as on the back of the leg. The whole limb was deformed by them; and the dilatation in the minute veins was such as to produce a general engorgement of the leg, a spongy state of the subcutaneous cellular tissue, and spots of arborescent blotches in the skin. The varices had never given issue to free hemorrhage; but he was subject to frequent extravasation of blood beneath the skin from the slightest bruise. The purplish spots thus produced often occupied the space of several inches square, continuing for two or three weeks, and then gradually disappearing. He had long been in the habit of wearing a roller on the leg, at first with partial benefit, but of late with no advantage.

After admission he was put on spare diet and placed on his back, with a roller applied tightly over the diseased limb, and a saline cathartic was administered. Notwithstanding the continued pressure of the roller, and strict observance of the recumbent posture, the vessels at the day of the operation, September 3rd, were still as prominent as ever, enabling me to operate without the use of the fillet. The veins were divided at five different points; the first above the knee, one in the upper part of the external saphena; all the rest on the internal saphena and its branches, the largest of which ran along the calf of the leg. The incisions were rather freer than usual, and the veins were raised by a thread, instead of the probe, as in former cases. About two inches of the main trunk of the vein were removed at the incision above the knee, and a large mass of convolutions, intimately interlaced, from the inner and upper part of the leg. No bleeding of any account occurred until after completing the last two exsections in the upper part of the leg and above the knee; but before applying the straps and compresses here the patient lost perhaps more than a pint of blood.

The points of interest observed in connection with the operation and examination of the portions of the veins removed, were—

1st. That the coats of the enlarged veins were not of equal thickness at the different points of incision, and that the thickening bore no relation to the degree of dilatation. Thus, the vessels in the thigh, enormously dilated, were but slightly hypertrophied; the thickness of its parietes was trifling in comparison to that of the large branches of the internal saphena below the knee.

2d. That the points at which the convolutions were the most numerous and agglomerated, were the points at which the greatest degree of hypertrophy existed in the coats of the veins.

3d. That the thickening at each point in the course of the vein was regular on all sides, and free from the small nodules of lymph or cartilage, as well as from small irregular thin pouches in the coats of the vessel, as witnessed in former cases, especially in such as had given issue to several hemorrhagies.

4th. The anatomical changes in the two coats were, as observed in other cases. The inner coat was marked by fleshy looking longitudinal fibres, and mottled at the various points of anastomosis with small purplish spots, as if by extravasation of blood between the two coats. The outer coat had the appearance of a thick and uniform layer of semi-diaphanous cartilage. The cellular investment beyond this was dense, and bound the vessels closely to the fascia and looser cellular tissue surrounding them.

5th. A fact worthy of remark was the very great contractile power of the vessels when freed from the cellular envelopes by which they were held in a state of dilatation. Thus, the saphena major, before exposing it, appeared to be nearly an inch in diameter; and, when exposed, and before it was separated from the surrounding tissues, its diameter was still the same. But after isolating it from these, and before it was divided, the isolated portion contracted so much as to lead me to suspect that I had fallen upon a small collateral vessel; it was not more than one-fourth its former size, if indeed so much. The same fact was observed in the lower branches; but owing to the greater thickness of the parietes of these, the degree of contraction after isolating them was by no means so great as in the saphena major.

6th. The subcutaneous extravasations, that had been of frequent occurrence, must have issued from venules too minute to be secured, as these vessels, in numerous patches, were very much dilated without any apparent increase in the thickness of their parietes.

About three hours after the operation the starched bandage was applied, without any instructions from me to that effect, the usual practice having been to apply this on the day following the operation, after having allowed sufficient time for swelling. In the evening I found the patient complaining of pain over the tibia. He had already taken a full anodyne; another was ordered and instructions given for dividing the bandage if the pain continued.

*Sept. 4th.* The patient had been in pain all night, and had slept little or none. Early in the morning he became sick at his stomach and vomited. The house-surgeon now slit the bandages over the seat of pain. At 8 o'clock A. M. I found him comparatively free from pain but with a rigor upon him. There was some tenderness at the left groin, which he attributed to the effort at vomiting. The lymphatic glands here were evidently enlarged, without any corresponding tenderness or swelling along the thigh. There appeared to be a distended vein under the integument at the point of the leg where the bandages had been cut, and the skin over them was slightly chafed. Another anodyne of solution of sulphate of morphia (gtt. xxx.) was administered, to be followed with spirit. minderer.  $\zeta$ ss. every second hour. At 2 o'clock, P. M. the patient was free from pain and disposed to sleep, pulse 80, tongue moist and clean. At 8 o'clock, P. M. he had taken another anodyne of half the former strength, and had continued the use of the diaphoretic. He had been free from pain all day, with his skin moist and

natural. He had an attack of epistaxis, but no return of nausea or vomiting. I found him asleep, with pulse at 100. A blister that had been applied in the morning over the enlarged glands at the groin, had drawn well. The chafed spot on the leg was now rather swollen and injected, but the enlarged vein had disappeared.

5th. The patient had slept well. In the morning had a cathartic of castor oil which operated freely. In the evening had a rigor which soon subsided. The circulation was free in the limb, he had no pain, but a small circumscribed swelling, like an enlarged lymphatic gland, had appeared on the track of the saphena at the middle of the thigh. A small blister was applied over this, and the other treatment continued. Hitherto, although with little relish, he had taken his regular meals, which were of the simplest kind.

6th. Had slept as usual, and was free from pain; pulse about 100, tongue clean; still on the anodyne and diaphoretic treatment. In the course of the day he had sickness of stomach and occasional vomiting after eating, or after the effervescing draught which had been substituted for the spirit. minderer. At night he had another rigor, which was slight, and followed by no excitement. No tenderness or unusual swelling in the limb. The tenderness and swelling in the lymphatic glands had been relieved by the blisters.

7th. He had vomited once or twice in the early part of the night, but rested as usual. Disposed to wander in his sleep, but intellect clear at other times; pulse 102.

9th. General condition as at last report. The bandages were partly removed. Over the tuberosity of the tibia, owing to irregular pressure, a small slough had taken place, and at the seat of the old and partly cicatrised ulcer on the shin the integuments had also given way, leaving a sore larger than the original one.

10th. The rest of the bandages removed. All the cuts, except one near the calf of the leg, were quite dry, and in process of healing. From this one there was a healthy purulent discharge. Simple dressings to the sores, dry lint to the cuts, and a many-tailed bandage over the whole.

12th. General condition gradually improving. No pain except at the calf of the leg where the adhesive straps exert an irregular pressure. The integuments here are inflamed, and a small abscess is about to form below the suppurating cut. The patient rests well, has no further irritability of stomach, and very little general excitement. A poultice was applied to the leg. The anodyne and diaphoretic course was still continued.

14th. A small abscess that had formed in the back part of the leg was opened; the foot and lower part of the leg for a day or two had been somewhat œdematous. He has little or no appetite, and is "romancing in his sleep." His skin is moist, and his pulse about 90, less full than formerly; and his tongue is heavily coated.

15th. Less inflammation, but more œdema in the limb. Pulse 88, soft and feeble; tongue moist and less heavily coated; romancing while asleep; skin moist and flaccid; slight emaciation. Patient has no pain, but speaks of inability to move the right leg. Simple dressings and a roller were substituted for the poultice, and the patient was put on the use of bitter infusion, with a more generous diet.

16th. Patient has eaten with more relish, has slept well, is free from pain, and speaks of soon being able to get about.

17th. General condition as at last report, but in the course of the day he

took a dose of castor oil which sickened him, and in the evening the nausea and vomiting returned.

18th. I had not an opportunity of seeing him. The nausea and disposition to vomit continued unchecked either by anodynes or the effervescing mixture.

19th. A pulse at 120 and very small, countenance anxious, skin bathed in perspiration, stomach still irritable. He spoke of severe pain in his hips. The discharge from the leg was rather free. He could not turn in bed without assistance. A sinapism was placed over his stomach, and he was put on the use of sulphate of quinine, about three grains daily, with wine whey, broth, and beef tea, as much as he was disposed to take.

20th. Stomach quiet since the application of the sinapism; tongue dry and brown. The ulceration over the shin has extended and left a part of the tibia bare.

21st. Increased prostration, and increased pain in the hips. This morning I observed the first joint of his right index finger much swollen and the integuments red, evincing the formation of what I supposed to be a secondary abscess. He attributed this to the habit of keeping the hand under his head while asleep. In the evening his tongue was dry and almost black, and he had slight subsultus, with muttering delirium during sleep; pulse still more frequent. He was put on brandy toddy.

22d. Had taken nearly half a pint of brandy during the night. Prostration in the morning less marked. The conjunctiva of the right eye engorged with blood. The stimulants were continued freely during the day, but towards night he began to sink rapidly, and he died about half past 7 o'clock, P. M.; rather more than nineteen days after the operation.

*Autopsic examination*, 20 hours after death. Some of the cuts made during the operation had cicatrised; the others were all far advanced in the process of healing. There were two small openings that had been made for the discharge of matter, near the calf of the leg, communicating with an abscess there that contained a few ounces of purulent matter. With the exception of a small part of the saphena major, all the veins of the limb, as well as those in every other part of the body, appeared to be free from inflammation; few or none of them even presenting the reddened appearance of their coats, so frequently the result of imbibition. The saphena major, for about five inches and a half above the uppermost incision, was thickened and adhering by lymphatic effusion to the surrounding tissues. It was discoloured internally, and blocked up with adherent and partially organised bloody lymph. But these morbid appearances terminated abruptly above, and were arrested here by an intervening valve. This valve itself was healthy, as were all the others above it.

A small bloody and fibrinous coagulum was found extending from the right ventricle of the heart into the pulmonary artery. The heart in other respects presented no abnormal appearances. The lungs and the abdominal viscera were healthy.

The principal seat of disease had evidently been the lymphatic system. The absorbent vessels running in vast numbers along the inner side of the thigh were thickened, consolidated, and opaque; in size and firmness resembling minute cords of catgut. The lymphatic glands were equally diseased. One of these, at the middle of the thigh, lay immediately upon the saphena vein, to which it adhered by firm fibrinous attachments. It was about an inch and a half long, oval, firm, and had numerous enlarged and

at the groin, both superficial and deep-seated, were also enlarged, indurated, and agglomerated. The disease in the absorbents and lymphatic glands above this part had probably given rise to the most striking lesion in the consolidated absorbent vessels entering it from below, imbedded in condensed cellular tissue, and others extending from it upward. The lymphatic glands body, and one which elucidated many of the symptoms that occurred in the progress of the case.

This consisted in an immense abscess extending in the course of the left psoas muscle, external to the iliac fascia, from the diaphragm to the groin, and passing at the groin under Poupart's ligament, on the inner side of the vessels, downwards on the thigh, where it was arrested by the pectineus and adductor muscles. The whole of the pelvic surface of the os ilium, as well as the portion of the os pubis forming the floor of this abscess, was exposed, bathed in purulent matter, but smooth and free from disease. The muscles lying in the course of the abscess, viz., the psoas, pectineus, and adductor femoris, were discoloured, softened, and approaching to a state of decomposition. The abscess, at its upper part, advanced close upon the vertebral column without actually reaching it. The vertebræ, so far as I could detect, were healthy.

There was a large concomitant vein running nearly parallel with the saphena major in front of the thigh, with numerous branches extending externally and downwards. It anastomosed with the saphena, first, just above the valve by which the adhesive inflammation had been arrested, and again just before its entrance into the femoral vein at the groin. This concomitant branch was about one-fourth the size of the saphena major, and nearly, if not quite as large as the saphena itself, as seen in some subjects. It was healthy, but contained blood partially coagulated, as did also the deeper veins in the limb, and the large veins in other parts of the body. This vessel had probably enlarged subsequent to the operation, and must have been of material assistance to the deeper veins, in returning the blood from the limb.

The details of this unfortunate case, which, towards its close, was looked upon as one of erratic phlebitis, throw much light upon some of the symptoms that follow operations upon varices, and serve to show that other circumstances, equally as important as phlebotic inflammation, must hereafter be taken into account in determining the propriety of any operation upon the veins. The fatal issue was evidently induced by inflammation of the absorbents, and not by phlebitis.

The signs in the early part of the case, which subsided after the loosening of the bandage, were probably owing to the extension of irritation in the course of the absorbent vessels, as indicated by the swelling and tenderness at the groin, and by the enlarged lymphatic glands in the middle of the thigh. It is difficult to say how far this irritation was the result of the irregular and painful pressure of the bandage on the leg, or how far the direct effect of a division of the absorbent vessels themselves during the operation. The subsidence of most of the constitutional symptoms for a few days before the close of the second week, shows that the inflammation of these vessels could not, at that period, have progressed above the groin. But the loss of power in the limb, the inability of the patient to turn himself in bed, the severe pain in the hips, the recurrence of rigors and sickness of stomach, the dry and

heavily-coated tongue, the emaciation, and the rapid and feeble pulse, all of which came on rather suddenly about the close of the fifteenth day, may be looked upon as indicating, at this period, a rapid extension of inflammation in the course of the absorbents, to the loose cellular tissue of the left lumbar region, eventually terminating in the recent abscess, which exhausted the patient, and was the immediate cause of death.

Before closing these observations on individual cases, I may remark that they constitute only the severer instances of varices that have fallen under my notice, and that, during their occurrence, I have had the management of numerous other cases. Some of these were the result of local injury, some of chronic ulcers, some accompanied tumours both simple and malignant, and some appeared to depend not so much upon an undue determination of blood to the lower extremities, from disease, severe labour, or the long observance of the erect position, as upon a natural laxity of fibre, either in the coats of the veins themselves, or in the tissues surrounding them. In several instances of this last class, the varices were less marked in the larger veins than in those of smaller calibre. They were nearly all observed in females of lymphatic temperament, with superabundance of fat in the limbs; one of them, however, was a youth of twenty years of age. These cases were mostly treated with the roller and by keeping the limbs elevated. In a few, I pencilled the integument over the veins with tincture of iodine, but with no appreciable advantage. I shall close the report of cases with the following:

CASE XVII.—A coloured woman, aged 28, had for eight years suffered from a varicose swelling on the saphena major, just below the knee, which she stated to have been produced by an inflammation at the upper part of the leg, caused by resting on her knees in scrubbing. For six years the varicose swelling appeared to remain stationary; but some time since, after having placed her feet in cold water, she was suddenly affected with severe pain and stiffness of the limb, and ever since the varices have been increasing. They now involve numerous branches of the saphena major on the leg, and extend around either ankle to the foot. She is subject to occasional attacks, during which the pain and turgescence of the limb are almost unsufferable. During these attacks she has been in the habit of puncturing the veins with a needle, in order to unload them. She has in this way often drawn half a pint of blood, or more, at a time. She has occasionally employed the common roller as a palliative, but from soon slipping and falling into irregular folds, it has given her so much uneasiness, that she can no longer resort to it. She was desirous of submitting to an operation for relief. From this, after the ill success above stated, I considered it my duty to dissuade her. I therefore resorted to another expedient. Requesting her to keep her bed for twenty-four hours with a common roller on the limb, in order to overcome the swelling, on the following day I applied several small portions of a common wax bougie, some longitudinally, others transversely, along the limb, over the course of the varices; I secured them in these situations, and then enveloped the limb in a starched bandage. On the succeeding day she was walking about; the bandage gave her no uneasiness except in ascending a flight of stairs. At the end of two weeks the dressings were still undisturbed. The patient ex-

periences no inconvenience from the varices, but it is too soon yet to anticipate the permanent result of the experiment.

*Part Second. I. Pathology.*—The term varix has been employed in a manner altogether too indefinite. By some writers it is applied to a sort of thrombus or pouching tumour in the walls of a dilated vein, holding the same relation to the vein as an aneurism to an artery.\* Others, using it in this sense, apply it also to varicose tumours formed by an agglomeration of convolutions, either in a single dilated vein, or in a congeries of veins intimately entangled.† The true import of the term, as used by the ancients and others, is still more comprehensive. A varix, according to Galen,‡ is a vein tumefied or dilated with blood. In this sense it is also used by Paulus Ægineta,§ Paré,|| J. Cloquet,¶ and others. It may be defined to be a vein morbidly dilated, and usually elongated, convoluted, and nodulated.

*II. Seat of Varices.*—Varices may occur in almost any part of the body. They have been observed on the head, on the arm; in the jugular veins, the subclavian, the vena cava, the azygos, the intercostal veins, the veins of the abdomen and pelvis, and the veins of the thoracic and abdominal parietes. They are most frequent in those parts of the body from which the blood returns with greatest difficulty to the heart, as in the superficial veins of the lower extremities, the spermatic, the hemorrhoidal veins.

*On the head and face* the disease is of rare occurrence. I have seen it on the lips, and in one instance in the minute veins of the conjunctiva. In this case the vessel ruptured spontaneously, and produced a diffuse ecchymosis. As a secondary affection, it is occasionally seen here among the results of chronic ophthalmia. The morbid growth on the conjunctiva, called pterygium, in some instances is evidently the result of a varicose enlargement of the veins of this membrane. According to Ætius,\*\* the disease may

\* Hodgson (on the Arteries and Veins, p. 538,) says, "A small portion of a vein is occasionally more dilated than the rest, and forms a prominent tumour, which is denominated a varix." On the same subject M. Monfalcon (Dictionnaire des Sci. Méd.) says, "elles sont à ces vaisseaux ce qu'est aux artères l'anevrisme qu'on appelle vrai."

† "Varix, κίρσος. Tumeur formée par la dilatation plus ou moins considérable et permanente des veines." Bégine, (Dictionnaire de Méd. et de Chirurg. Prac.) Mr. S. Cooper gives the word this sense in his definition of it, whilst in his article on varicose veins, he gives it the more liberal application.

‡ As given by Fœtius, (Economia Hippocratis, appended to his Latin version of Hippocrates); also by himself, "varices venæ dilatatae sunt."—(Epitome Galeni Operum, fol. Lugduni, 1643, p. 459.)

§ As adopted by Fabricius ab Aquapendente.

|| The small tumours, by some modern writers called varices, Paré distinctly characterises under the name of Thrombus. (Les Œuvres d'Ambrose Paré, fol. Paris, 1579, p. 484.)

¶ Dictionnaire de Médecine.

\*\* As stated by the translator of Hippocrates.

occur upon the eyelids; others have noticed it on the temples. Alibert\* has found almost every vein of the head affected with varices. Portal\* has discovered varices in the meningeal veins of the head; and, according to Monfalcon,\* they occur in the vessels of the pharynx and upper part of the œsophagus, and bursting here, give rise to extensive hemorrhage.

*In the veins of the arm*, varices, as a primitive affection, are exceedingly rare. In a case recorded by J. L. Petit,\* the disease occurred at the flexure of the arm. The patient was fat, and no other vein being apparent, M. Petit, wishing to bleed the patient, was obliged to puncture the varix with a lancet. M. Roux† saw a case under the care of Sir A. Cooper, in which the superficial veins of the fore-arm were immensely distended. As a secondary affection, however, varices are as frequent on the arm as on other parts. I have seen them here in connection with malignant tumours. Monfalcon quotes a case from M. Cartier, in which all the superficial veins of the upper extremity were affected. The disease was congenital, but increased with the growth of the patient. At the age of twelve, "the varices were separated from one another by considerable depressions; the skin was bluish and livid, in a word, the arm and fore-arm appeared to be full of nodosities." This, I suspect, was an instance of aneurism by anastomosis, a disease in its origin very different from the one under consideration, but which, as is well known, may extend in the course of the large vessels, and in the end produce all the appearances of simple varices. Aneurismal varix, or that variety of the disease which is produced by the passage of arterial blood from its proper vessel, through an unnatural opening into a vein, is of more frequent occurrence on the upper extremity than on any other part of the body, owing to the fact that the operation of venesection is now almost exclusively performed on the vessels of this part.

*In the veins of the neck* the disease has been observed by Morand,‡ Cline,§ Portal,|| and M. Roux.¶ Cases similar to that recorded by Morand are not unfrequently the result of obstructed circulation through the heart. The jugular veins in this instance were of the thickness of a man's thumb. The woman had suffered from palpitation, faintings, and continual pulsation in the jugular veins—"The right auricle of the heart was almost filled with a polypous concretion, the branches of which reached through the neighbouring veins quite to the jugular." In Mr. Cline's case, the patient was also a female, who had a large pulsating tumour in the neck, which burst, and proved fatal by hemorrhage. "A sack proceeded from the internal jugular

\* Dictionnaire des Sciences Médicales.

† Medico-Chirurgical Review for July, 1832, p. 184. From Journal Hebdom.

‡ As quoted by Morgagni, Letter xviii, article 9.

§ Hodgson. Treatise on the Arteries and Veins, p. 539.

|| Dictionnaire des Sci. Méd.

¶ Medico-Chirurgical Review for July, 1832, vol. xvii., new series, p. 184.

vein; the carotid artery was lodged in a groove at the posterior part of the neck."

"A man, aged 23, entered the Hôpital de la Charité under the care of M. Roux. There was a tumour situated immediately above the clavicle, of the size of a pigeon's egg, which was at first supposed to be an encysted tumour; it was firm, elastic, and did not pulsate. The patient had noticed it for about two years, but it was only within the last two months that it had given him any annoyance. Its true nature was not ascertained before the operation; when cut into, a quantity of coagulated black blood flowed out." The swelling was now discovered to be formed by the dilatation of a venous branch communicating between the two jugulars. We are not told which jugulars, probably the deep and superficial of the same side. M. Roux put a ligature round it, and also around several thoracic branches. Fortunately the wound healed perfectly in a fortnight."

Varices in the subclavian vein are extremely rare. M. Hodgson and others refer to a case of this recorded by Portal: the dilatation was excessive in the right subclavian vein, and terminated fatally by bursting into the cavity of the chest.

*In the veins of the thorax* varices have been observed by several authors. Morgagni,\* on the authority of other writers, refers to several cases of varices of the vena cava, and other large veins attached to, or in the immediate neighbourhood of the heart, and gives the particulars of a case from Manfredi, of a varix of the vena azygos, which ruptured and terminated fatally. The vein, though contracted by the effusion, "had retained so much of its breadth, that it might be well compared to the vena cava. This dilatation had extended itself to about the length of a span, and about the middle of that length a foramen lay open, in the form of an ellipsis." Portal† has recorded three instances of this same condition of the vena azygos. In one of these the disease had also extended to the inferior intercostal veins, one of which was open.

*In the veins of the abdominal and pelvic viscera*, varices occasionally occur. Internal abdominal hemorrhages, according to Monfalcon, are frequently caused by the rupture of varices. In one of the preceding cases I have noticed a varicose condition of the veins of the uterus and its appendages. An instance occurred to M. Cruveilhier,‡ in which a varicose condition of the veins of the round ligament was found in connection with a strangulated hernia: the nature of the disease was made evident after the operation. The internal surface of the bladder is sometimes affected with varices, which rupture and give rise to hæmaturia; but the veins in the neighbourhood of this organ most frequently affected, are those that surround the prostate gland. In a

\* Letter xxvi, articles 28 and 29.

† Monfalcon. Dictionnaire des Sci. Méd.

‡ Medico-Chirurgical Review, vol. viii., new series, p. 543.

patient who had suffered from a tumour of the *luette vésicale*, which had given rise to hypertrophy of the bladder, to calculous deposits, disease of the kidneys, &c., I found some of the plexuses of veins around the neck of the bladder and base of the prostate gland larger than ordinary goose quills. The vagina and vulva are occasionally the seat of varices. During parturition they are exposed to injury, and when ruptured, may lead to fatal hemorrhage. Cases of this sort have been recorded by Dr. Elsasser and others.\* The veins of the urethra are sometimes affected in the same way, giving rise to symptoms analogous to those of stricture, and on the introduction of catheters or bougies, giving rise to profuse and alarming hemorrhage. Such, I have reason to believe, was the fact in the following case:

Mr. C., a Smyrnesse, aged 40, had long suffered from a slight obstruction in the urethra, which was supposed to be an ordinary stricture. A few slight applications of lunar caustic had been made with apparent benefit. On the 26th of March, 1842, the caustic was applied with as much caution as usual at the supposed seat of stricture, between five and six inches from the meatus urinarius. The amount of caustic dissolved was scarcely appreciable. The patient experienced no unusual symptoms until Sunday night, March 27th, about thirty-two or thirty-three hours after the introduction of the instrument. But feeling a disposition at this time to evacuate his bladder, he arose from bed, and, after some effort, began to evacuate clotted blood. During the night he was frequently aroused to repeat the same procedure, so that before the morning he passed nearly a chamber-potful of this clotted blood, mixed with fluid blood and urine. The discharge recurred about once an hour until the afternoon of the 28th, at which time I first saw him. He was pale, cold, agitated, and frequently shivering. He complained of throbbing in his head, and sighed frequently and deeply. His pulse was weak, disposed to intermit, and ranging at sixty in a minute. His physician had administered rhatania extract internally, and had applied cold wet cloths to the perineum. The patient informed me that he could continually feel the blood, as he lay on his back, dropping, as he expressed himself, "*goutte par goutte*" against the *bas fond* of the bladder. A solution of acetate of lead, fifteen grains to the ounce of water, was thrown into the urethra through a silver canula, previously introduced about four inches and a half into the passage. After injecting about four ounces of the solution into the bladder, and withdrawing the instrument, a compress was applied to the posterior part of the perineum, and directions were given, in case the hemorrhage returned, to introduce a tampon of ice into the rectum. The patient had no evacuation of the bladder for several hours afterwards. About midnight he again voided a small quantity of clotted blood and urine; the tampon of ice was then introduced. On the following morning he voided healthy urine, free from blood. He had no subsequent return of the hemorrhage.

*In the veins of the thoracic and abdominal parietes.*—On the chest and upper part of the body varices are rarely observed, except as the effect of tumours and of carcinomatous diseases. In their simpler form they are not unfrequent on the walls of the abdomen. In one of the foregoing cases there existed a varix of considerable size in the superficial epigastric vein.

\* American Journ. Med. Sci. vol. xvi. p. 233—234.

Varicose tumours of immense size sometimes form on the lower part of the abdomen, especially in women who have borne several children, cases of which have been recorded by Severinus,\* Boyer,† Bordeu,‡ and other writers.§ I have observed extensive varices on this part of the body in connection with ovarian tumours; and on the hips and loins, in connection with bony tumours.

*In the hemorrhoidal and spermatic veins.*—These vessels, next to those of the lower extremities, are the most frequent seat of varices. In the veins of the rectum and anus, the disease receives the specific name of the piles, or hemorrhoids, and is of too much importance, and attended with too many peculiarities, both in a pathological and therapeutical point of view, to be spoken of incidentally. It may, perhaps, be the subject of a future essay. The same remark will apply, but not so forcibly, to the disease in the veins of the testicle and spermatic cord, where it constitutes varicocele, or, as it is still occasionally, and more properly called, cirsocele.

*In the veins of the lower extremity.*—This part of the body is beyond all comparison the most frequent seat of varices. The main object of the cases reported at the commencement, is to illustrate the disease as it affects this part. Leaving then the history of varices as they occur in other parts of the body, we have now to speak of them in the vessels of the leg and thigh.

III. *Stages in the progress of varices.*—When this disease in the veins of the lower extremity is the result of local injury, or of any morbid influence acting directly on the limb, the varicose enlargements usually appear first in the neighbourhood of the affected part, or in the vessels that receive the blood directly from it. But they most frequently commence just below the inner side of the knee, and again in the vessels ramifying through the loose cellular tissue just above the heel, on either side of the tendo Achillis. The great saphena and its branches are more frequently affected than the saphena minor, owing to the shorter course and peculiar termination of the latter. The deeper vessels are but rarely involved. They are not, however, exempt. In the autopsic examination of Case XVI., I observed a very extensive varix behind the knee, in one of the deep veins, just before its entrance into the femoral.

The changes produced in the vessels by the progress of the disease are, first, simple dilatation, which, though it may result from mere physical distension, soon leads to a proper interstitial development, in the same way that morbid, and even healthy developments, are sometimes effected in other organs, as in hypertrophy of the muscles by healthy exercise of them; hypertrophy of the heart, by mechanical distension and over-action; morbid development of the bones of the head and face, and of the soft parts connected

\* De Recondita Abscessuum Natura, Cap. ix., § 13.

† Maladies Chirurg., tome ii., p. 359.

‡ Monfalcon. Dict. des Sci. Méd.

§ Medico-Chirurgical Review, vol. xix., p. 213.

with them in some cases of chronic hydrocephalus, and from tumours in their neighbourhood.

The next important change is an increase of length. This is in a still more marked degree the result of interstitial growth, and not of physical distension. As the vessel grows in length, it falls into folds and serpentine convolutions, and these occur most readily at points within which the vessel is under least restraint from fascias or dense cellular tissues, or other resisting envelopes. The walls of the vein about this period occasionally yield irregularly to the pressure of the blood, and form the small pouches which some have compared to aneurisms, and to which Paré gives the name of thrombus. These several irregularities in the shape and course of the vessel, at first appear to be easily effaced; they disappear under certain movements of the limb; but by degrees they become fixed. The vessel contracts intimate adhesions to the surrounding tissues, which in their turn take on a diseased action, and become condensed into firm bands, extending from one fold or convolution of the vein to another, holding the vessel in its irregular shape, preventing it from exercising its proper elastic force for diminishing its calibre, and as the folds and convolutions at a particular point increase, binding them into one mass in the form of a varicose tumour. At this stage of the disease, by forcing the blood from the vessels, they may be made to collapse, so as to be no longer visible externally. A few days' repose, or the pressure of a bandage, may so far relieve the varices, as to lead us for a time to suppose that they have been entirely obliterated. The mistake, however, is corrected as soon as the pressure is removed, and the blood is allowed to descend into the limb.

The next stage in the progress of the disease is an increase of thickness in the elastic coat of the vessel. This, in its healthy state, is always delicate, and never so firm as to prevent the vein from collapsing when deprived of blood. But in the progress of morbid development, it may become, even in the terminal branches of the saphena, thicker and firmer than the corresponding coat in the largest arteries. When examined under these circumstances, it is found to have a pale bluish, grayish, or sometimes yellowish-white appearance, a cartilaginous hardness, and considerable contractile force. The cellular tissue surrounding it is also consolidated, sometimes nearly as firm and compact as the elastic coat itself. In some cases, especially in the early stages, the hypertrophy is uniform in the whole circumference of the vessel, though never so throughout its whole extent, being generally greatest at the point where the varix first appeared, or where it has been subjected to the greatest irritation. But in other cases, especially where the convolutions are short, numerous, or intimately involved, the elastic coat is thrown into nodules, and transverse prominences and depressions; the prominent points on the inner face of the vessel being usually the seat of nodules, or of an undue degree of hypertrophy, whilst at the depression on the opposite part of the vessel the parietes may be but little, if any, thicker than natural.

Sometimes these nodules are so numerous in the course of the vessel, when felt beneath the skin, as to give a sensation similar to what might be produced by a chaplet of beads, or by a hard knotted cord. This feeling, however, is no evidence that the calibre of the vessel has been obliterated or obstructed with fibrinous coagula. Pressure, the horizontal position, or any other mode of emptying the vessels, may at this stage diminish the size of the varices, but will not even temporarily obliterate them.

The inner coat appears to be the last to suffer. This at first is found smooth, shining, and diaphanous; at a later period it is thrown into reticulated depressions, and afterwards into minute longitudinal folds, giving it, with the reddish tinge which it has now acquired, the appearance of delicate muscular tissue. At this stage, though the inner membrane adheres closely to the elastic coat, and follows it through all its transverse ridges and depressions, it may, nevertheless, readily be torn in large patches from the latter, and these patches, when thus removed, show the membrane to have been thickened; the longitudinal folds disappear, the reddish tinge continues, but no vessels are visible in its texture to the naked eye.

In varices resulting from tumours and malignant growths, the coats of the veins are rarely or never thickened as above described, but are subject to the diseases of the surrounding tissues, and when inflamed, the blood coagulates within them, and may in this way prevent the loss of blood, on the super-vention of ulceration or sloughing. More frequently, however, their parietes give way before the blood coagulates, causing copious hemorrhage, which continues to recur as the disease progresses, and is the immediate cause of anasarca swellings, sinking of the vital powers, and finally of death. But the coagulation of blood in ordinary varices is a rare occurrence. I have never had occasion to witness it independent of inflammation. As a result of inflammation, however, it is as likely to occur in varicose veins as in any other. Cases of spontaneous phlebitis supervening on varices, and terminating fatally, are reported by Mr. Lawrence and others. The strings and shreds of coagulable lymph mentioned by some writers as occurring in varicose veins, I have never witnessed on first opening into these vessels. In the autopsic examination of Case XVI. I noticed them, but only in the parts of the vein from which the circulation had been previously intercepted by the operation, and which were already in the process of obliteration. In short, the spontaneous closure of varices, independent of acute phlebitis, is rarely or never noticed. The knotted and cord-like character of the vessel, when felt beneath the skin, even if accompanied with a marked diminution of size, or following a previous state of unusual swelling and excitation, is not to be taken as proof of the closure of the vein. In Case XV. all these circumstances were observed before the operation, and in some of the vessels afterwards; but in the autopsic examination the diseased veins were found pervious, and most of them apparently as much dilated as they had ever been.

Varices accompanying ossific and osteo-sarcomatous tumours, are some-

times found imbedded in grooves upon the surface of these tumours. Mr. Hodgson states that similar grooves are sometimes found on the surfaces of healthy bone in cases of ordinary varices. This I have not witnessed; but the induration of the tissues on either side of a varix, may give the finger when pressed upon the vessel, a sensation similar to what might be produced by a depression in the bone.

IV. *Complications.*—Often before the walls of the veins take in the state of hypertrophy above described, the languid circulation and increasing turgescence in the capillaries, lead to swelling of the limb. The skin and subjacent tissues are engorged with venous blood, infiltrated with serum, or consolidated with lymph. Ulcerations difficult to heal break out spontaneously, or after the slightest injury, around the ankles or lower part of the leg; or pruriginous eruptions in the form of lichen, or chronic eczema, attack the flexures of the joints, the natural folds of the skin, or those parts of the limb upon which the varices are most troublesome. The cellular tissue is occasionally the seat of small indolent swellings that rarely suppurate, but occasionally take on gangrenous inflammation. These form immediately over varices, to which they adhere; and which, indeed, give rise to them. They usually bind the diseased vessel to the skin, and after ulcerating or sloughing, give rise to sudden hemorrhage. The subcutaneous tissues are also occasionally the seat of sanguineous effusions, sometimes from the minute vessels, at other times from those of greater size, occurring either spontaneously or after trifling injuries. The varices themselves, already in a state of excitation, are peculiarly subject to sudden attacks of erethism bordering on subacute inflammation. This in turn leads to extension of the disease to vessels not previously affected, or to its more rapid development in those that have already suffered; or it induces ulceration in their coats which sooner or later progresses to the surface, and gives rise to sudden hemorrhage. Finally, acute suppurative phlebitis may supervene spontaneously in the progress of varices, and lead to fatal consequences; as in a case of Mr. Lawrence's, reported in the *Lancet*, (Jan. 20th, 1827, p. 527.) and in others, reported in the same journal, (Sep. 10th, 1825, p. 305.) from the *Archives Générales*.

Among these various complications the ulcers are the most frequent; and if not the most dangerous, are at least among the most troublesome. Of these there are three kinds: first, the ordinary indolent ulcer, occurring about the ankles and lower part of the leg, indeterminate as to size and form, but always obstinate. Independent of its connection with varices, and of its intractable nature, it has no characteristics to distinguish it from other ordinary ulcers. The second form is a minute perforating ulcer not much larger than the head of a pin, never larger than a pea, and is produced by the extension of ulcerative action from the vein outward. It is surrounded with little or no swelling or induration: it gives rise to hemorrhage which may

recur a few times before the ulcer closes. Finally, it cicatrises, and is not likely to reappear. The third form is also small, occurring in the centre of one of the small indolent tumours already noticed, either after an abrasion of this, or after the separation of a slough. It gives exit to hemorrhage, as in the second form; heals up spontaneously soon afterwards; but is likely to reappear during intervals of excitement in the vein beneath it, or after injury.

It has been remarked, perhaps correctly, that the loss of blood from varices, when moderate, has not the same prostrating effects as other hemorrhages. The blood in these vessels is habitually in excess, and the whole system often in a state of plethora, as indicated by attacks of epistaxis and hemorrhage from organs remote from the diseased veins. The function of sanguification appears to be exalted either to supply the loss caused by frequent bleedings from the varices, or to repair the deficiency in the rest of the body caused by the recession of blood to the dilated veins, in which it remains shut off, as it were, from the general circulation. This plethoric condition is strongly shown in those cases in which the simple application of a roller to the limb, or any other measure calculated to force the blood out of the varices into the general circulation, has led to congestion or inflammation of distant organs, to hæmatemesis, diseases of the lungs, and other alarming consequences. Madame Boivin, says Velpeau,\* cites the case of a girl who when pregnant, could bring on an abortion at any time, by bandaging her legs, which were varicose. Mr. Freer's case, reported by Mr. Hodgson,† in which a ligature applied to the saphena vein gave rise, within four hours afterwards, to violent pain in the left side of the chest, quick and laborious respiration, inability to speak, and at length to vomiting of blood; and in which the alarming symptoms subsided on the removal of the ligature; and reappeared on repeating the operation several weeks afterwards;— is evidently another striking example of the same sort.

V. *Causes.*—Without entering minutely into the special causes of varices, we may remark that they most frequently occur during the middle periods of life, and almost invariably after the age of puberty, in persons of both sexes habituated to severe labour, or protracted exercise on foot; or who have suffered from other affections determining an undue quantity of blood to the lower extremities, or preventing the blood already there from returning freely to the heart.

In reference to their causes, then, varices are either primary or secondary. The first occur in persons of lax fibre, of lymphatic or sanguineous temperament; the coats of whose veins are naturally delicate, who have a superabundance of fat in the limbs, whose superficial veins lie loose in the midst of soft cellular tissue, free from the restraint of sheaths or dense surrounding

\* *Médecine Opératoire*, tome 2d, p. 262. Paris, 1839.

† *Treatise on the arteries and veins*, p. 551.

textures. The second may result from chronic ulcers, from cutaneous eruptions, morbid growths, local injuries, spontaneous inflammation, or they may occur after long confinement to the recumbent position, or in the train of other diseases, especially of the abdomen; as in disorders of the portal system, ovarian and other tumours, the gravid uterus; and, as some believe, from obliteration of the larger veins. It should be remarked, however, that mere mechanical obstruction is never of itself sufficient to give rise to varices. The blood when impeded in its course through its natural channels, is almost immediately diverted into others, so that obstructions of this sort, instead of producing varices, are, in fact, among the most efficacious means of curing them.

Mr. Hodgson has intimated that varices may be the result of rupture of the valves of the veins; and Sir Everard Home thinks that in varices the valves are thickened and contracted. I am not aware of any facts on record to establish these points. In every instance in which I had an opportunity of examining the veins, the valves were perfectly healthy. Nor have I been able to confirm an observation made by Boyer, that varices are most apt to appear immediately above the situation of the valves. The truth is, valves are not often found in the midst of varicose enlargements, except in the saphena major above the knee. Even in healthy veins their number and position are indeterminate. I have at times been led to suppose that they are less numerous in persons subject to varices than in others. But if disease in the valves has not been shown to give rise to varices, the impairment of their function after the varicose dilatation has commenced, evidently tends to aggravate it. In Case XVI. after the saphena major had been divided, pressure applied immediately above the incision, instantly arrested the hemorrhage; but when applied at the distance of three inches above this point, it only served to aggravate it. The autopsic examination showed that a healthy valve situated between these two points, had not been able to prevent the regurgitation of the blood entering the saphena from a large collateral branch that opened into this vein above the valve.

VI. *Diagnosis.*—Varices may be overlooked or confounded with other diseases. In the thorax of persons dying of phthisis they have been found, where no such complication had been suspected.\* We have no means of forming even a probable diagnosis of their existence, during life, in any of the natural cavities; except so far as they may occur in connection with other varices in vessels leading immediately into these cavities. Even in the superficial vessels they are sometimes overlooked. In the feet and lower part of the legs of adipose women, they may give rise to considerable swelling, which may be attributed to serous infiltration, or to irregular depositions of fat. At the groin, in the upper part of the saphena major, in the

\* Morgagni, loc. citat.

superficial epigastric veins, or in the femoral vein, &c., they occasionally give rise to tumours, which may be taken either for aneurisms or for hernial protrusions. Instances of this sort have been noticed by Sir Astley Cooper,\* Dupuytren,† Cruveilhier,‡ and others. The diagnosis in such cases is readily effected by pressing on the disordered veins, at the distal side of the tumour. In the lower part of the neck the veins are sometimes observed to pulsate, and when varicose may be mistaken for aneurisms. Morgagni in reference to these, says, "we may distinguish the veins I am speaking of from the carotid arteries, if we attend to their external situation, and the softness of their parietes; and especially if with Morand we observe that upon pressing the finger upon them, that part of the vessel which is below the finger shall, according to the laws of the circulation, subside; and that part which is above is increased, or at least preserves its former distention."§ Dupuytren also described a pulsating varicose tumour at the groin, that might have readily been confounded with aneurism of the femoral artery.|| Again, erectile tumours or aneurisms by anastomosis, when subcutaneous, may at times be mistaken for varices. Such I suspect was the fact in a case of reputed varices of the fore-arm, quoted by M. Monfalcon¶ from M. Cartier. For the peculiar characteristics of these tumours I must refer to my essay on Telangiectasis.\*\*

VII. *Terminations.*—I have already had occasion to speak of the disposition of varices to occasional attacks of turgescence or erethism, during which the hypertrophy of their coats progresses with rapidity. On the subsidence of this state, the undue amount of blood which it attracts towards the veins, forsakes them; they contract somewhat upon themselves, and may diminish their calibre so much, as in future to contain even less blood than naturally belongs to them. This same mode of termination also probably goes on in a more protracted manner in the ordinary process of the disease, where neither erethism, inflammation, nor ulceration, supervenes to interfere with the gradual hypertrophy of the coats of vessels. In persons who have recovered from one or two attacks of the venous erethism above mentioned; and in others who have long relinquished the laborious habits that gave rise to varices; and again, in very aged people who had formerly suffered from these, we occasionally find that their former varices have so far diminished as to give them no uneasiness, and to be distinguished only by their corded and irregular feeling under the skin.

The calibre of the vessels under the foregoing circumstances, is simply reduced in size; the second mode of favourable termination, is in absolute closure of the veins. This mode of termination I suspect, is effected only

\* Lectures. † Medico-Chirurg. Rev. March, 1829, vol. x., new series, p. 575.

‡ Ibid. vol. viii., new series, p. 543.

§ Letter 18th, section 11th.

|| Medico-Chirurg. Rev. March 1829, p. 575.

¶ Dictionnaire des Sci. Med.

\*\* American Journ. Med. Sci. vol. xxiv. p. 24.

by the supervention of active inflammation. When inflamed, the inner membrane of the veins throws out coagulable lymph, which interrupts the course of the blood through them; the blood itself coagulates, and adheres to the parietes of the vessel; the vessel itself adheres to the surrounding tissues, and if the inflammation is arrested in this its adhesive stage, the fibrinous effusion within the vein gradually becomes organised, the coagulated blood is absorbed; and the vessel is converted into a ligamentous cord, which at a still later period is finally resolved into its primitive cellular tissue. But if the inflammation proceeds to suppuration, and is still limited to the varices, fibrinous effusions, and purulent collections form both on their inner and their outer surface; the integuments ulcerate, and after the evacuation of the pus the inflammation subsides, and the varices are finally obliterated, as under the former circumstances.

Finally, varices may terminate spontaneously in death. The fatal result may be induced, first, by suppurative phlebitis, as in two cases already referred to; the one in the practice of M. Ribus, the other in that of Mr. Lawrence.\* This mode of termination, occurring but seldom as a spontaneous result, is the most common in fatal cases after operations. The symptoms and anatomical characteristics of traumatic phlebitis, I have sufficiently illustrated in another place.†

Secondly, Varices may lead to fatal consequences by the direct loss of blood, as in Case III. A similar case is mentioned by Heister,‡ in which the patient bled to death in his bed. I have already referred to Morand's case, of rupture of a varicose jugular terminating fatally, and to Mr. Cline's case of a varix in the same vessel terminating in the same manner. In three cases reported by Dr. Elsasser,§ the patients, during labour, bled to death from the rupture of varices in the vulva. Four others are cited in the *American Journ. Med. Sci.* (vol. xvi. p. 234.) in which women under similar circumstances died of loss of blood from varices in the vagina and external parts of generation. Many writers, speaking of varices on the lower extremities, without reporting cases, allude to instances of fatal hemorrhage. It is incorrect, observes M. Velpeau,|| to say that varices are unattended with danger. The contrary of this was sufficiently proved by M. Girod in 1814. Petit has demonstrated the serious effects of ruptured varices. Two patients, mentioned by Lombard, died of these. Chaussier cites an instance of ruptured varix in a pregnant woman terminating fatally. Murat has given an account of a washerwoman who died suddenly of the same accident. In 1827 a similar case was mentioned at the Academy of Medicine. I saw, continues M. Velpeau, a countryman, in 1819, die of hemorrhage twenty-four hours after the bursting of a varix. The death of Copernicus was owing to this cause. MM.

\* *London Lancet*, Sep. 10th, 1825, p. 305; and Jan. 20th, 1827.

† See my essay on secondary abscesses. *Amer. Journ. of Med. Sci.* v. xxi. p. 37.

‡ *System of Surgery*, vol. ii. p. 344.

§ *American Journ. Med. Sci.* vol. xvi. p. 233.

|| *Médecine Opératoire*, tom. ii. p. 262.

Reis, Lacroix, and Lebrun have published similar facts. A pregnant woman under the care of M. Forestier, from the same cause, was reduced to the same extremity. To this list of M. Velpeau's I may add, that in Cases VIII. and X., already reported, the danger from hemorrhage was equally as imminent as in the pregnant woman last cited.

Again, after operations the disease may terminate fatally, independent of phlebitis, by the extension of inflammation to the absorbents, with or without the concomitant formation of abscesses in the course of these vessels. The absorbents are, indeed, intimately involved in most of the diseases of the veins, whether spontaneous or traumatic. In cases of spontaneous obliteration of the veins, attended with dropsical effusions, M. Bouillaud\* and others† have attributed the effusions to the obstruction in the veins, the real cause of which, however, was more probably owing to simultaneous diseases in the absorbent vessels accompanying the veins. For, there are numerous cases on record to show that veins even of the largest size, and many of them together, may be completely obstructed without giving rise to œdema or dropsical effusions. "I have already observed," says Mr. Brodie,‡ in speaking of varicose veins of the lower extremity, "that there are some reasons for believing that the venous branches are less liable to be inflamed in consequence of mechanical injury than the trunks in which they terminate." The observation is correct, so far as it refers to the occurrence of inflammation, and is probably owing to the fact that the trunk of the saphena is surrounded by an immense number of absorbents, that suffer under every operation upon this vessel, and participate in most of its diseases. In Cases VI. and XIII. the absorbents were evidently inflamed after the operation, as shown in the one by the enlargement of a lymphatic gland over the saphena major in the middle of the thigh; and in the other, by linear inflammation in the integuments and enlargement of the glands at the groin. In Case XVI. the fatal result was evidently induced by the extension of inflammation along the absorbents, and from them to the loose cellular tissue in their course along the psoas muscle. Such, also, was probably the cause of death in one of the cases given by Mr. Hodgson, the symptoms of which were analogous to my case, and the autopsic examination of which evinced enlargement of the inguinal glands, without any visceral disorder, and with evidences of phlebitis, to say the most, equivocal, and by no means sufficient to account for death. "The whole of the vein above the wound, as far as its junction with the femoral vein, was removed. Its internal coat was redder and more vascular than natural; no coagulable lymph or pus was effused into its cavity, nor was any other preternatural appearance observed in it."§

In the fourth place, death may be induced after operations, as in Case XV.,

\* *Lancet*, June 26th, 1824, p. 407, from *Archives Générales* for May 1824.

† *American Journ. of Med. Sci.* vol. ix., p. 204, from *Arch. Gén.* for April 1831.

‡ *Medico-Chirurgical Transactions*, vol. vii., p. 201.

§ *Diseases of the Arteries and Veins*, p. 557.

by the excess of reaction, and subsequent collapse, in persons already much reduced by previous or existing disease. Here the fatal result falls into the general category of those from all other operations upon persons whose general health is equally depraved. I have known the same result from the removal of a toe, and in three instances from the application of ligature to small hemorrhoidal protrusions. It is worthy of remark, that in persons dying under these circumstances, we usually find firm fibrinous concretions in the heart. Are these the cause or the consequence of the collapse? To attribute them to phlebitis, without other evidences of phlebotic inflammation accompanying them, is neither philosophical nor correct.

Lastly, Death may ensue, after operations, independent of phlebitis, by the recession of blood from the varicose vessels into the course of the general circulation, a result most likely to occur in persons of plethoric habit, and immediately produced by the sudden engorgement or inflammation of one or more of the vital organs. Death, under these circumstances, is preceded by such symptoms of constitutional disturbance as would otherwise characterise congestion or inflammation of the organs upon which the onus of disease is fixed. The organs, perhaps, most frequently affected in this way, are the lungs. Hence the occasional detection of pleuritic effusion, pneumonia, and pulmonary engorgement in the bodies of those supposed to have died of phlebitis, but in whom the veins are either healthy, or but triflingly affected. Some of the older surgeons were sufficiently aware of the dangers resulting in this way from meddling with extensive varices. "Il est meilleur," says Paré, "de ne toucher aux inveterées, parce qu'elles preservent de plusieurs maladies, à cause que le sang regare aux parties nobles, dont s'ensuit ulcères et chancres et suffocations."\* This observation, however, was not original. Galen, before him, had made the same remark: "Quòd si venas illas turgentes melancholico humore quis moliatur excidere, periculum imminet, ne homo corripiatur melancholia: id quod fieri sæpius est visum, non in varicibus modò, verum etiam in hæmorrhoidibus, quæ ex hujusmodi humore consistunt."†

*Part Third. Treatment. I. General Indications.*—In the treatment of varices surgical interference may be requisite; first, on account of the ulcers and inveterate eruptions, induced by, or accompanying them; secondly, on account of the repeated and alarming hemorrhage occasioned by them; and not unfrequently on account of other annoyances, as pain, turgescence, and rigidity of the limb; conditions, it is true, not often compromising life, but sufficient, nevertheless, to prevent the patient from following his usual occupation, and to render life uncomfortable.

The modes of treatment of which we are about to speak, it should be here remarked, have reference, principally, to the disease as it affects the lower extremities. Some of them are, indeed, applicable to the disease in the

\* Les Œuvres, fol. p. 484. † Epitome Galeni Operum. Fol. Lugduni 1743., p. 341.

spermatic and hemorrhoidal veins; but varices in most other parts of the body either call for palliative treatment only, or are so situated as to be beyond the reach of art. A mere enumeration of the writers and surgeons whose names are connected with special modes of treating varices, would be no inconsiderable undertaking. Such of them as have given most attention to the subject, will be noticed as we proceed.

There are three distinct groups of indications to be fulfilled in the treatment of varices. The first of these is to prevent engorgement of the limb, and without undertaking to cure the disease, to keep it from increasing, or from exciting ulceration, or other concomitant affections; or to relieve these, when existing. The second is, to render more effective relief by reducing the size of the vessels, without suddenly obliterating them. The third is, to obliterate the varices at once, and to force the blood into new channels. The means employed for effecting the first of these are purely palliative measures. Those for the second are not always successful, and are sometimes dangerous. Those for the third are more efficacious than the others; but, at the same time, painful in their application, and still less exempt from danger.

II. *Special Treatment.* First. *To prevent engorgement of the limb; to keep the disease from increasing, or from exciting ulceration, or other concomitant affections; or to relieve these when existing.*

The most effectual mode of fulfilling these indications is by moderate and equal compression over the affected part, aided, as occasion requires, by elevation of the limb, simple dressings to the sores, specific applications for arresting hemorrhage; detergent, anodyne, or cooling applications to the eruptions.

*Compression.*—The credit of introducing gradual and equal pressure over the whole of the affected limb, for the relief of varices, has been awarded to Avicenna. The practice is probably of more ancient origin. The *caliga*, or legging, of the Roman soldiery, may have been employed, among other purposes, for relieving or preventing varices. Fabricius employed it, made of dog skin, for this purpose. In more modern times it has given place to the laced stocking, or gaiter, either of chamois leather or of cloth. The common roller has long been used for the same purpose. For these Mr. Travers has substituted adhesive straps. The starched bandage may be at times advantageously substituted for either of them.

*Local Depletion.*—Punctures, scarifications, or small incisions into the veins, for the purpose of unloading them, is a practice mentioned several times by Hippocrates,\* and by some of the other ancient writers; and recommended by Paré,† Petit,‡ and other modern surgeons. In Case XVII. it was employed by the patient herself, suggested to her by her own sufferings, and

\* Sect. I. De Medico; also, Sect. VI. De Ulceribus.

† Les Œuvres, fol. Paris, 1579, p. 484.

‡ As stated by Hodgson and others.

frequently repeated, during states of unusual fulness of the vessels, with temporary benefit. As a means of treatment it is rarely advisable. The object for which it is recommended by Petit, viz., the evacuation of coagula, is frequently hypothetical. And the punctures and incisions, small as they are, when practised upon diseased vessels, subject the patient to all the dangers of more important operations, without offering him an equal chance of cure.

*Second. To diminish the size of the vessels gradually and permanently.*—Varices, as already stated, may in some cases be gradually reduced, if not actually obliterated, by a change from the habits or modes of life that give rise to them. This result will be more likely to ensue, when, to the change of habit, is superadded permanent and well regulated compression, with other adjuvants. But varices may be more rapidly, yet still gradually, reduced, by special modes of applying pressure, by exciting inflammation in the tissues surrounding them, or by other special modes of acting on the veins without dividing them.

*Direct pressure on the veins.*—Fabricius was in the habit of applying a compound astringent paste along the course of the varicose vessels, covering this with a reed, the hollow of the reed corresponding with the convexity of the paste; and binding on this dressing with ligatures, or with a roller drawn tightly round the limb. "Thus," says he, "by the pressure, first of the roller, then of the reed, and by the astringency of the medicament, the varices have so far diminished as to appear to have been dried up."

In Case XVII. I resorted to a process somewhat less complicated, which may be applied as follows:—Take a common wax bougie, somewhat larger than the medium size, cut it into pieces of an inch or two in length; secure these at the detached points along the course of the varices, (longitudinally where the vein is straight, transversely where it is thrown into tumours,) by means of small adhesive straps. Then secure the whole with a common roller, laced stocking, or starched bandage, which should be applied as tightly as the patient can conveniently bear; the ordinary bandage, or stocking being the best for the first few days; and the more permanent application afterwards, as soon as the swelling which usually accompanies the varices has subsided.

Mr. Travers succeeded in obliterating a varicose cyst of the saphena, behind the inner condyle of the knee, by means of adhesive plaster, applied in strips around the limb with as much tightness as could be borne. "The vein took on inflammation, and the cyst became a perfectly solid tumour, which afterwards shrunk, and was perfectly obliterated. The inflammation was severely painful, and accompanied by extreme tension of the part, and with considerable fever."\*

*Local irritants.*—With a view to reduce the varices without obliterating

\* *Surgical Essays.* Philad., p. 190.

the vessels, Mr. Mayo\* recommends the application of an escharotic, composed of equal parts of soft soap and potassa, to the integuments. More recently MM. Laugier,† Berard,‡ and a few of the English surgeons,§ have employed the Vienna paste, a compound of equal parts of quick lime and potassa, for the same purpose. These applications, whatever be the special mode of using them, may give rise to diffuse phlebitis, to hemorrhage, and even to fatal consequences; and, if not carried so deeply as to excite adhesive inflammation in the vessel, they necessarily fail. Mr. Brodie,|| with the same view, has advocated the application of blisters along the course of the diseased vessel; a measure, from what I have seen of it, less likely to succeed than it is to prove injurious.

I do not find that electricity has ever been employed by any of the surgeons who have written on the subject of varices. A case is reported in the Lancet,¶ of a midwife who employed it for the cure of the disease in the vessels of her own limbs, as she states, with much relief.

The tincture of iodine, first introduced, I believe, by Mr. Herbert Finch\*\* for the cure of varices, has recently found some favour with the profession. When applied of sufficient strength to act as a caustic to the integuments over the varices, it may perhaps be attended with some benefit.

*Third. To obliterate the varices at once, and to force the blood into new channels.*—The anastomosis between the superficial veins of the lower extremity, as, indeed, between the veins in every other part of the body, are exceedingly numerous. Several of the largest vessels of the leg, including both saphenas, may be totally obliterated, without impeding the circulation. The blood, under these circumstances, is returned, at first, mostly by the deeper vessels, but, soon after the interruption, by numerous superficial anastomosing branches, as shown in Case XVI. Before these superficial vessels are sufficiently enlarged, the blood, indeed, has to seek the deeper channels; but the contraction of these from the action of the muscles obliges it to seek another course, external to the fascia lata, through which it can move at all times, free from the impediment of muscular pressure, to which the deeper veins are continually subjected, and which renders them, for the most part, empty during moments of active exertion.

Aware of the ease with which the blood is returned by new channels after

\* Medico-Chirurg. Rev. vol. x. new series, p. 250.

† Bulletin Chirurgical, 1839, quoted by Dr. Scratchley in Lancet, May 14th, 1842. p. 225.

‡ Gazette Médicale de Paris, Jan. 22, 1842.

§ Dr. Scratchley, and Mr. Clay of Manchester. Lancet, July 18th, Aug. 29th, Oct. 17th, Dec. 12th, 1840, and July 24th, 1841.

|| Lancet July 5th, 1828, p. 446.

¶ Lancet April 5th, 1834, p. 44.

\*\* Lancet Aug. 24, 1833, p. 707.

its proper veins have been obstructed, surgeons have long been in the habit of attempting the obliteration of these veins when diseased; and for this purpose they have employed a great variety of measures. Among these may be enumerated laceration, cauterisation, excision, erosion, ligature, incision and its modifications, the seton, and special modes of compression between folds of the skin, with a vice or clasp, or with pins and twisted sutures.

*Laceration.* This barbarous mode of treatment was in use among the early Romans, and was practised, as we are told, on Caius Marius, who, after submitting to it on one leg, refused to have it tried on the other. It was performed, according to Paulus, by elevating the varicose veins, and tearing them forcibly from their attachment.

*Cauterisation.* The actual cautery is recommended by Celsus; but like the foregoing treatment, it has long since been rejected.

*Excision.* The removal of varices by excision, was also practised by the ancients, as we learn from Celsus,\* Galen,† and Paulus Ægineta.‡

*1st. By multiplied incisions.* This the Celsean method, is performed by dividing the skin, drawing the lips of the wound apart with small hooks, laying the vein bare with a scalpel and passing a blunt hook under it. After thus exposing the vessel at one point, the operation is to be performed at intervals of four fingers breadth along the whole extent of the varix. The first hook is then to be raised, and the portion of the vein resting upon it, is to be excised; and so with the rest, until all the exposed portions are removed. The lips of the wounds are then to be approximated, and covered with agglutinating plaster.

*2d. Preceded by ligatures.* Galen operated in two ways; first, when the varix was small, by simply excising it; and again, where the vein was likely to bleed freely when divided, by first placing ligatures upon it, and then dividing it between these.§

*3d. With temporary compression and subsequent ligature.* Paulus Ægineta describes the operation on the saphena major above the knee. He commences by binding the upper part of the thigh with a cord, and directing the patient to walk about, in order to render the varix prominent. He then traces its course with ink upon the skin. He now directs the patient to lie

\* Lib. vii. Cap. xxxi. † Epitome Galeni Operum. De Methodo Medendi. Lib. xiii.

‡ On the authority of Paré and Fabricius.

§ The early introduction of the ligature as a means of arresting hemorrhage from both arteries and veins, appears to have been forgotten of late. The following is the whole of the passage in which it is spoken of by Galen. "Quòd si inter nudandum appareat tibi vas magnum, aut magnum exhibere pulsum, tutius fuerit vinculo id prius excipere, mox quod in medio est, præcidere. Sunt autem ejusmodi vincula ex materia aliqua minimè putrescibili, potissimum si iis arteriæ sint excipiendæ. Etenim quæ caro in abscissis vasorum partibus coalescit, ea pro operculo est, atque ipsorum oscula claudit. Quod quidem ubi factum jam cernimus, decidere tunc tutò vincula possunt. Ac sic etiam varices curamus, quæ dilatatæ sunt venæ, potissimum circa crura et testiculos."—Epitome Galeni Operum fol. Lugduni, 1643, p. 459.

down, and ties a second cord just above the knee. Then, with a scalpel, he divides the skin over the part marked with ink; he next detaches the vessel from its membranous envelopes, seizes and elevates it with a hook, cuts it off, unties the cord, allows a certain amount of blood to flow when this can be done with safety, and then applies the ligatures above and below, which he passes beneath the vessel by means of a needle, and perhaps, also, through the skin, making them at the same time serve as sutures, for closing the lips of the wound.\*

*Erosion.* We have already spoken of the potential cautery, as recommended by Mr. Mayo, for partially obliterating the diseased vein. The difference between this mode and that long since recommended, (as we are told,)† by Paré and Guillemeau, is scarcely appreciable, except that the older surgeons applied the caustic so deeply, as at once to erode the coats of the vein, leaving a space between the open orifices, to be filled up by cicatrisation. As a means of radical cure even this bolder use of the caustic is liable to failure, unless applied as recommended by Mr. Bonnet,‡ along the course of the veins, at intervals of three or four inches; and even repeated, where the first application fails to reach the vessel. The dangers attending this mode of practice are numerous. It gives rise to abscesses along the course of the vessels, to alarming hemorrhage, to diffuse phlebitis, and has resulted fatally.

*Simple Ligature.* To Sir Everard Home we must attribute the institution of this practice. The ancients, as already shown, employed the ligature in connection with other means; but only for the purpose of arresting hemorrhage. Home was the first to publish any account of it as a means, by itself, for removing varices.§ Supposing them mainly to depend on thickening

\* It is remarkable that several recent writers give the credit of the operation here described to Ambrose Paré, whilst Paré himself, as shown by his marginal note, has evidently given the credit of it to Paulus. The mode of applying the ligature, however, as given by Paré, is more after the manner of Galen. Fabricius, from whom I have taken the operation, seems to have some doubt as to the exact mode in which Paulus applied the ligature.

† Several authors attribute to Paré the first employment of the potential cautery in the treatment of varices. In the copy of his works to which I have access, I find no mention of this practice; at least, none in the chapter devoted to the subject of varices: and I am still more surprised that in another chapter to which M. Bonnet refers, (livre 13, chap. xx. p. 315.) he does not even so much as mention varices. The following, however, is the passage, cited by several writers, in which he speaks of the caustic, and which I am obliged to give on the credit of M. Bonnet. "Autre moyen de couper les varices, c'est d'appliquer un cautère potentiel qui roûge et coupe la veine, puis se retire en haut et en bas. Par ce moyen, il y demeure un espace vide où après s'engendre de la chair, et puis la cicatrice qui sera dure et épaisse empêchera la fluxion en bouchant le passage de ladite veine, et, par ce moyen, la veine variqueuse sera guérie."—Archives Générales, Mai, 1839, p. 48.

‡ Mémoire sur le Traitement des Varices. (Archives Générales, Mai et Juin, 1839.)

§ Practical Observations on the Treatment of Ulcers on the Legs, &c., chap. ix.

and rigidity of the valves, which prevented these from occupying the whole area of the vein, it appeared to him no small object to take off a part of the pressure of the column of blood, by establishing an artificial valve; and this he did by applying a ligature to the saphena major near the inner side of the knee, just above the point at which the branches from the leg unite to form the common trunk. He appears, however, to have borrowed the practice from Mr. Hunter, who, in one case, operated in this way on several branches. As a means of cure, the simple ligature is frequently effectual, but not uniformly so. It has frequently proved fatal; and the dangers attending it are so numerous, that it has for the most part been abandoned.

*Incision.*—*1st. Longitudinal Incision.* This plan of treatment, introduced by Mr. Richerand\* in 1823, has had but few advocates. It consists in making a longitudinal incision of some inches in length, through the integuments and diseased vessel; and after unloading this by the escape of blood, filling the wound with lint; and allowing it to heal by granulation.

*2d. Transverse Incision.*—This practice originated, so far as I can ascertain, with Mr. Brodie,† who in speaking of it, observes: “I found it to be preferable to the use of the caustic, as the operation occasioned less pain, and as (in consequence of there being no loss of substance) the wound was cicatrised in a much shorter space of time.”‡ He soon, however, relinquished it for his simpler and safer operation, viz: *3d. The Subcutaneous Incision.*—This he performs with a narrow convex bistoury, which he introduces through the skin on one side of the varix, and passes in between the skin and vein, with one of the flat surfaces turned forwards and the other backwards, until it reaches the opposite side. He then turns the cutting edge of the bistoury backwards, and in withdrawing the instrument the division of the varix is effected. He recommends this operation only when there are but few varices in the limb; and performs it on the branches, but never upon the main trunk of the saphena. I have already shown its liability to failure. It was at first looked upon as entirely free from danger. We are told, however, that such is not the fact. “Division of the vein with a valvular wound of the integument is surely no violent injury to the vessel, and yet it is occasionally followed by fatal inflammation.”§

*The Seton.* This operation, invented by M. Fricke, is performed by transfixing the vein with a needle, armed with a single thread, leaving the thread in the wound, traversing the vein; and allowing it to remain there long enough to excite adhesive inflammation, in the varix, and thus to consolidate the vein. The procedure is to be repeated at two or three points

\* Philadelphia Med. and Physical Journal, vol. viii. p. 449, from *Medico-Chirurg. Rev.* March, 1824.

† *Medico-Chirurg. Transactions*, vol. vii. p. 195, *et seq.*

‡ In other hands it has terminated fatally. See Velpeau, (*Médecine Opératoire*, vol. ii. p. 259.

§ *Medico-Chirurg. Review*, vol. x. p. 251. December, 1828.

along each of the vessels affected. This operation too, like most of the others, has been attended with fatal consequences.\*

*The Elastic Truss.* This is spoken of by Sir Charles Bell,† and Mr. Colles.‡ The latter is said to have used it with considerable success. He applies the pad of a circular truss over the saphena major at the groin, with force sufficient to prevent the passage of blood through the vessel.

*The Vice, or Screw Forceps.* This instrument, applied by its inventor, M. Breschet,§ for the cure of varicocele, was afterwards used by M. Sanson in the treatment of ordinary varices. It consists of two parallel iron plates, cushioned on their inner face, which are approximated, or separated, by means of screws. For applying it, the vein must be elevated on a fold of integument, and then embraced between the two plates of metal, which are approximated by means of the screws, until they are sufficiently close to interrupt the circulation, or even to excite a slough, in all the parts embraced between them. The application of this instrument is attended with much pain. The surgeon is obliged to shift it frequently from point to point, along the track of the vein. If not applied with sufficient force to cause a slough of the skin, it is not likely to produce a permanent closure of the vessel. From the trials which I have seen with this instrument, in the practice of M. Sanson, I should never dream of using it.

*Subcutaneous Stricture.* There are several distinct modes of interrupting the circulation through the vessel, by pins and ligatures, without exposing it; all of them of recent origin.

*1st. M. Davat's Method.*|| This surgeon commences by applying a temporary bandage just above the knee, and then requiring the patient to walk about for a few moments, in order to distend the varices. The patient then sits down; and the surgeon elevating the saphena major in a fold of integument, passes a needle transversely through the skin, beneath the vessel, and so on out at the opposite side. A second needle is next to be carried through the skin and the coats of the vein, under the first pin, and at right angles with it; and then brought again through the vessel and integuments to the surface, thus puncturing the vein at four points; and pressing it so firmly against the first pin, which lies under the vessel, as to arrest the course of the blood through the vein. These pins are now to be secured by a thread, in the form of a twisted suture, which is not to be applied very tightly; and allowed to remain until they become loosened by the ulcerative process, and then removed. If the first operation do not remove the whole

\* Velpeau, Médecine Opératoire, vol. ii. p. 269.

† Lecture, in London Medical Gazette, vol. xiii. p. 428.

‡ Velpeau, *ut supra*, p. 266, and Library of Practical Medicine, 2d edition, Phila. vol. ii. p. 625.

§ American Journ. Med. Sci. vol. xvii. p. 234.

|| Du Traitement Curatif des Varices. Par Davat, 8vo. Paris, 1836. See also review of the work in American Journ. Med. Sci. vol. xx. 460.

of the varices, he repeats it afterwards at a few points in the branches of the saphena, lower down. This operation is less dangerous than that by the seton; but it has, nevertheless, led to fatal results.\*

2d. *M. Velpeau's Method.*† This surgeon uses but a single pin for strangulating the vessel at a given point. This he passes transversely beneath the vein without puncturing it, precisely in the same way as that practised by M. Davat for the passage of the first pin. But he repeats the process at two or three points upon the saphena above the knee, and upon all the dilated branches on the leg and foot; using eight, ten, or even fifteen pins upon the same limb. Sometimes, however, says he, two or three applications are sufficient. After thus inserting the pins, he embraces the extremities of each of them in a circular ligature, which is to be tied with sufficient force to strangulate the portion of integument and vein resting upon the pin, and to cause it to slough. With this practice M. Velpeau was at first remarkably successful, having had more than a hundred cases before he met with an instance in which it terminated fatally. Of late, however, his success has not been so great; and it is now conceded that this operation is as dangerous as the rest. In one case that terminated fatally, it was found that the pin had been so placed as not to interrupt the track of the vessel.‡ Such indeed is likely to be often the case, especially among the lower branches of the saphena, where, in consequence of the induration of the tissues, it is sometimes impossible to raise the vein sufficiently to allow the pin to be passed transversely under it.

3d. *M. Regnaud's Method.*§ This consists in passing a thread, by means of a needle, transversely under the vein; applying a roll of basilicon, or of wax, or a small graduated compress, on the integuments immediately over the vessel, and then drawing the ends of the thread tightly over this, and tying them in a slip knot. The ligature in this way may be tightened or loosened at pleasure. It is not so likely to be efficacious in obliterating the varix as either of the two former methods.

4th. *M. Ricord's Method.*|| This process has been more particularly used in reference to varicocele; but it is also applicable to varices on the lower extremity. It consists in passing two ligatures transversely; the one beneath, and the other above the level of the vein; but both below the skin, and traversing the integuments through the same openings. When thus applied they are to be tightened, by tying their extremities together with sufficient force to strangulate the vessel.

III. *Appreciation.*—The foregoing summary of operations constitutes a formidable list, sufficient in itself to show the difficulties and dangers both of the disease itself, and of the measures that have been devised for overcoming it. Severe as some of these measures are, they are all subject to failure;

\* Velpeau, loco citat. p. 270.

† Loco citat. p. 271.

‡ Medico-Chirurg. Review, vol. xxxvi. N. S. p. 556.

§ Ibid, p. 275.

|| Amer. Journ. of Med. Sci. vol. i. new series, 1841, p. 516.

and with the exception of simple compression, and one or two other means, even less efficacious than this, there is not one of them thus far practised to a sufficient extent to prove its efficacy, that has not led to fatal consequences. Nay, even pressure itself is not practised at all times with impunity. Some of these operations are, doubtless, intrinsically more dangerous than others. But their danger is in proportion neither to their efficacy, nor their apparent severity. It holds a more exact relation to the susceptibility of the veins already diseased, to an aggravation of their morbid action; to the state of these veins before the operation; and to the patient's general health at the time of submitting to it.

It is to be regretted that we have no statistics worthy of the least dependence, for establishing the proportionate mortality that has attended operations upon diseased veins. Those who have published the results of their own experience, have almost invariably presented us with a striking array of successful cases, in order to set off some new or favourite invention, leaving the counter-stroke of failures and fatal consequences, to be either guessed at or heard of accidentally from others.

A principle of much importance, one upon which any operation, to be successful, should be founded, is the necessity of interrupting the circulation at more points than one in the course of the varicose vessels, and of multiplying these interruptions in proportion to the extent of the varices and the freedom of their anastomoses. This, though evidently the principle upon which the operation of Celsus was founded, appears to have been forgotten for a time, until the attention of the profession was again called to it by M. Bonnet. Impressed with the importance of it, and believing, as I still do, that a vein is less likely to become inflamed after a clean section, than after any other operation upon it; and rejecting the caustic, as recommended by M. Bonnet, I undertook the operation as detailed in the foregoing cases. But if the result of these bears out the importance of this principle, they also show that a clean cut cannot be made through a diseased vein without endangering the life of the patient.

Still the disease is a dangerous one; or, if not dangerous, troublesome and distressing. What then is to be done for it?

If called upon to treat a varicose limb, free from complication either with ulcers, eruptions, local inflammation, or constitutional disturbance; until some means is discovered more simple and efficient than any yet employed, I should treat it with the view of fulfilling the second indication, as I have described under the head of direct pressure, and as practised in Case XVII. If there be an ulcer, I would elevate the limb; dress the ulcer as any other under similar circumstances, independent of the complication; apply a simple roller to the limb; and after curing the ulcer, treat the varices as before. Are there eruptions; are the veins turgid and painful; or is there any local inflammation complicating the varices? Treat the one or the other of these as independent affections; by elevating the limb; applying detergent, anodyne, or antiphlogistic lotions, or other similar applications; and

after curing or relieving these, attend to the varices. Is there hemorrhage? Elevate the limb; keep the patient quiet on his back; apply a compress and roller until the ruptured vein has healed; and afterwards attend to the varices. In a word, whatever be the complication, palliate the disease until this is overcome; and then undertake the treatment of the varices, by attempting to effect their gradual and permanent diminution.









