

THROMBOSIS OF THE FEMORAL VEINS FOLLOWING ASEPTIC LAPAROTOMY.

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It is my purpose to report the following case, not on account of any peculiarities associated with the diagnosis or treatment, but because of an unexpected and unpleasant complication occurring after convalescence had become well established.

Mrs. V., age 35, consulted me in November, 1902, regarding a double hernia. The history she gave indicated that the rupture on the left side had been present for twelve years, during which time she had worn a truss which had only imperfectly retained the protrusion, especially during heavy work. On the right side the hernia had only been present a few weeks, was gradually becoming larger, and was the seat of considerable pain.

On examination a condition of bilateral oblique inguinal hernia was found, the mass descending easily on both sides during straining efforts, and being as easily returned.

Excepting this condition the patient was in perfect health; there was no discoverable cardiac, renal or pulmonary lesion; no anemia, nor were there any varicosities of the superficial veins of the lower extremities. Operation was advised, but owing to extraneous causes was not performed until the third week of January in the present year.

Bassini's operation with McEwen's treatment of the sac was done on both sides under one etherization. The round ligaments were found large and inseparably blended with the sac wall, and they were accordingly dissected from their pubic attachments and puckered up with the sac.

Contrary to my expectations the operation on the right side proved much the more difficult, the sac being more adherent to surrounding structures, a small part being divided off by a septum to form a small hydrocele with insignificant fluid contents. For these reasons there was much more handling of the tissues and more extravasation of

blood on the right than on the left side, the time occupied being about twice as long.

The whole operation was carried out under the strictest aseptic technique, including the use of rubber gloves. A flat table was used, and there was neither Trendelenberg position nor flexion of the knees or hips.

A moderately firm double spica bandage was applied, but as this caused some little irritation it was replaced after the first day by a many-tailed bandage firmly pinned across the hips, which, owing to its tendency to slip, was in turn replaced by adhesive straps.

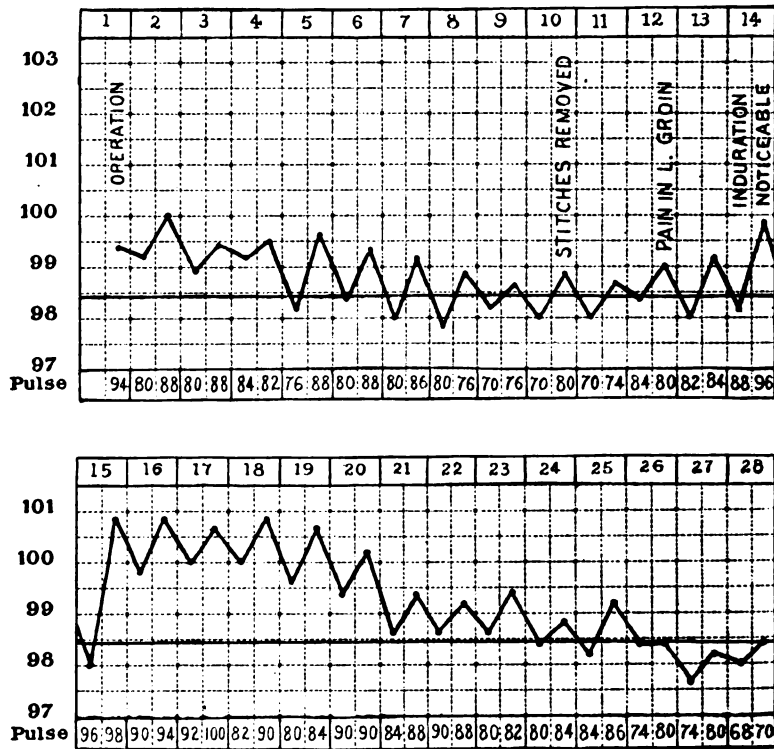


FIG. 1.—Clinical chart showing temperature and pulse.

The early convalescence was entirely uneventful, the temperature never exceeding 100 F., nor the pulse 90. The wounds were not dressed until the tenth day, when the stitches were removed, primary

union having occurred on both sides in the most satisfactory manner. I may be pardoned for emphasizing the fact that there was absolutely no redness, induration or tenderness around either of the wounds. On the next day some slight pain was complained of in the right groin, which, however, disappeared without treatment.

On the twelfth and thirteenth days considerable sharp shooting pain was complained of in the left groin, popliteal space and calf of leg. On the fourteenth day a hard indurated tender cord could be made out occupying the position of the upper end of the long saphenous vein. Accordingly venous thrombosis was diagnosed, the leg elevated and moist heat applied to assist in the establishment of the collateral circulation. Up to this time there had been absolutely no fever. On this day, however, the temperature rose to 99 2-5 F., and on the next to 101 F., at which height it was maintained for nearly a week. The pulse rate was increased in proportion, but did not become elevated before the temperature, as Singer's investigations would tend to show occurs in phlegmasia alba dolens. The condition ran a more or less benign course, the temperature becoming normal on the twenty-third day, although considerable pain and stiffness in the leg persisted for some weeks longer. During the height of the process there was considerable edema in Scarpa's triangle, but at no time was there any at the ankle.

The condition was then, in short, an extensive venous thrombosis involving the left saphenous and femoral veins, following two weeks after an aseptic operation, with typically aseptic wound healing. Moreover, it occurred on the left side, upon which the less extensive operation had been done, where there was less handling of the parts and less hemorrhage, but where a truss had been more or less constantly worn for twelve years.

It is not my intention to go into an extensive discussion of the various theories which have been advanced from time to time as to the causation of venous thrombosis, such as those of Hunter, Virchow and Brucke, but on looking over the literature of the subject I find that there are a few articles dealing specifically with this special condition, particularly those of Schenck, Willy Meyer, Coe and Van der Veer, in English; and of Lennander of Upsala, Strauch of Moscow, Wyder, and Leopold and Mahler, in German.

All of these authors consider more or less briefly the question of the special etiology of this condition, aside from the question of the etiology of thrombosis in general.

Infection, mechanical obstruction to the circulation resulting from tight bandaging, loaded bowels, flexed thighs, etc., and traumatism during operation, and, particularly, more or less extensive hematomata resulting from the use of retractors, are among the more common causes upon which special stress is laid.

Strauch, after considering his cases, remarks: "It appears, therefore, that the specific effect of the ether, plus the high position of the pelvis, has brought about this unpleasant complication."

Lennander believes that the possibility of compression of the respective veins by the dressing, as well as the possible coagulation of blood in the veins of the lower extremity as the result of constipation, should be avoided. He further considers that the condition is, at least partly, due to mechanical obstruction of the circulation, and advises elevation of the foot of the bed as a preventive measure during the entire period of convalescence.

The majority of the writers on the subject consider that infection is the most probable cause, though, as Meyer puts it: "The infection need not start from the operative field, but may originate elsewhere, especially in the intestinal tract." Schenck concludes that "the fact that they have not followed pus cases and that the condition occasionally occurs after operations upon the appendix, gall-bladder or right kidney; in short, cases in which the site of operation is more or less removed from the site of the thrombosis, are points difficult to explain under the theory of infection."

Schenck's conclusions are open to the same criticism in that the very cases which he cites as illustrative of the improbability of infective origin are themselves often infective. Thus in both of Willy Meyer's appendix cases more or less acute peritoneal inflammation was present, and he consequently agrees with those who consider infection as the causative factor of the complication under discussion and points out the possibility that a few bacteria coli or staphylococci may have lain dormant in adhesions and have been stirred into life by the manipulations incident to the operation.

In this connection it is interesting to note that at a discussion recently held before the Paris Society of Surgery MM. Jalaquier and Brun both reported three cases of left femoral thrombosis occurring in the course of appendicitis and connected, not with the operation itself, but with the condition calling for operation, since in two cases the only operative measures used were the evacuation of abscesses. The editor of the

New York Medical Journal likewise says: "Left femoral thrombosis may yet come to be regarded as of diagnostic significance in obscure cases in which only the possibility of appendicular inflammation can be affirmed."

In a large percentage of the cases, however, to which I refer, neither wound infection nor inflammatory disturbance in other parts of the body can enter into the discussion, since nearly all the wounds followed a typically aseptic course, as in the case here reported, and in many, at least, there was no evidence of infective conditions elsewhere. Moreover, the fact that the pain and induration caused the diagnosis to be made in my case before there was any distinct elevation of temperature shows that an infective origin is improbable. As the bowels had been well cleared out and were maintained so after the operation it is hardly likely that distension of the sigmoid with fecal matter and absorption therefrom could be regarded as an etiological factor. Again, the fact that out of Schenck's forty-eight cases only four occurred before the tenth day would seem to cast doubt upon the possibility of infection, since we should expect this to manifest itself earlier.

That the elevated temperature is not in itself evidence of an infective origin is pointed out by Meyer in these words: "In the case of a thrombosis changes in the blood within the thrombosed vessel, as well as in the tissues immediately surrounding it, may have set in and from these areas poisonous albuminoid substances may be absorbed by the system and thus produce rise of temperature and increased action of heart."

In considering Schenck's cases one is struck, as he was, by the large percentage following operations for the removal of tumors, especially since, as he says, they are not the cases in which there is the most traumatism, great loss of blood or the greatest chance of infection. Twenty-eight of his cases, or 58 per cent, followed the removal of large tumors, myomata or ovarian cystomata, while in addition five followed radical operation for carcinoma uteri and one a hysterectomy for pelvic inflammatory disease, thus giving a total of thirty-four cases in which it is possible to conceive that there might have been some very distinct alteration in the pressure relations before and after the operation. Of the total this represents 71 per cent. Feeling that such a change of pressure might have some causative influence in at least a proportion of the cases I have so far as possible looked up the reports with the following results:

Author.	Number of Cases.	Condition.	Side.	Result.
Schenck.	4	Perineal repair.		Recovery.
Schenck.	19	Hystero-myomectomy.		Recovery.
Schenck.	9	Ovarian cystomata.		Recovery.
Schenck.	5	Hysterectomy for carcinoma.		Recovery.
Schenck.	3	Suspension.		Recovery.
Schenck.	4	Suspension with repair.		Recovery.
Schenck.	1	Hysterectomy for inflammation.		Recovery.
Schenck.	3	Miscellaneous.		Recovery.
Lennander.	5	Appendectomy.		
Willy Meyer.	2	Appendectomy.	Left.	Recovery.
Strauch.	1	Hystero-myomectomy.		
Strauch.	1	Right ovarian cyst.	Left.	
Strauch.	1	Large tumor ovary.	Left.	
Van der Veer.	1	Angioma of lobus spigelii.	Left.	
Van der Veer.	1	Large bilateral ovarian tumors.	Left.	
Van der Veer.	1	Large fibroid, filling pelvis.	Left.	
Van der Veer.	1	Recurrent appendicitis.		
Coe.	1	Perineal operation with removal of both adnexa.		
Coe.	1	Left oöphorectomy and appendectomy.		
Coe.	1	Cyst left ovary and appendectomy.		
Coe.	1	Left dermoid, filling abdomen.		
Coe.	1	Cysts of ovaries.		
Coe.	1	Operation for inversio uteri.		
Coe.	1	Trachelorrhaphy.		

69 cases, divided as follows:

Appendectomy, eight; perineal, five; while for the removal of abdominal tumors, whether benign, malignant or inflammatory, there were forty-four, or 64 per cent.

The reports of Wyder and of Mahler and Leopold were also consulted, but they are concerned rather with the occurrence of post-operative pulmonary embolism, arising both from crural and pelvic thromboses, most frequently the latter.

In this connection I must recall the fact that in the above reported case a truss had been worn for many years and was only permanently removed at the time of the operation. Again, the bandages, owing to some degree of restlessness on the part of the patient, were only lightly held in place and exercised no pressure over the wound. Adding then this case to the above, there are seventy cases, forty-five of which, or 65 per cent, followed conditions of decreased pressure. If, however, we subtract from these seventy cases those in which there

was undoubted infection in other parts of the body, as, for instance, the appendix cases, we have left sixty-two cases, of which forty-five, or 73 per cent, were dependent on operations which brought about conditions of lessened local tension.

All of the writers upon this complication have emphasized its late occurrence. Thus twenty-five of Schenck's cases occurred between the twelfth and the sixteenth day, which may perhaps be taken as the average period.

Mahler and Leopold in their article call attention to the fact that when a large neoplasm is removed the intra-abdominal pressure sinks and the pelvic veins become dilated. This condition cannot but predispose to the formation of thrombi in the veins affected, since all the surroundings are favorable—injured vessel walls from trauma and slowed current from the dilatation. Hence we may suppose that thrombi form and gradually spread from smaller to larger vessels until either the internal or the external iliac vein becomes involved. As it would, of course, take some considerable time for this condition of slowly spreading thrombosis to reach the larger vessels the usual late occurrence of the complication is readily understood.

Another hypothesis which might be advanced would be that the decreased pressure permitted the exudation of large amounts of serum and blood into the tissues, which by coagulation and organization might give rise to secondary or late pressure on the veins.

Nothing new can be offered regarding the treatment of this state when it arises. Elevation of the limb and moist heat to favor the formation of the necessary collateral circulation seem best to meet the indications. Lennander's suggestion as to prophylaxis by elevation of the foot of the bed would seem difficult to carry out. Moreover, it would assuredly make nine hundred and ninety-nine patients uncomfortable in order that one might have a little better chance of escaping this complication. Again, Van Buren Knott reports 326 cases of laparotomy treated post-operatively by elevation of the head of the bed (Fowler's position) without any increased tendency to phlebitis. If, however, the above quoted facts are of any value and if deductions can be safely drawn therefrom, it would seem advisable to support the abdomen rather more definitely than is usually done, especially after the removal of large tumors. After hernia operations it would appear to be well to exercise a certain degree of direct pressure over the wound area, probably most comfortably carried out by a well applied spica of crinoline.

From a consideration of the above statements it is probable that the following conclusions may be safely drawn:

1. No single etiological factor is alone responsible for the occurrence of this complication.
2. The role of infection, in otherwise non-infective cases, does not appear to be an important one.
3. Conditions of sudden decrease of pressure dependent on the operation probably exert a causative influence.
4. Treatment should be prophylactic, by avoiding unnecessary traumatism, hemorrhage, or a sudden decrease in tension, by having the wound area well supported by firmly applied dressings.
5. So far as I am aware, there has been no mortality in the reported cases, but the occurrence of pulmonary embolism in a certain proportion warns us that this termination is not an impossible one.

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