
PHLEBITIS FOLLOWING ABDOMINAL OPERATIONS.¹

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THE occurrence of so distressing and unlooked for a complication as thrombophlebitis toward the last days of an otherwise gratifying and cheerful convalescence following a serious surgical operation is to the surgeon not unlike encountering the skeleton at a feast, and his feeling of chagrin is not devoid of a certain element of humiliation. It is one thing that he has scarcely considered in making the prognosis, and to the patient it is as a bolt from the clear sky. The suffering which accompanies it, and the entailed disappointment of being consigned to the bed for six weeks longer, seldom fails to arouse a feeling of rebelliousness on the part of the patient, and one akin to exasperation on the surgeon's part.

The estimate of Cordier as to the frequency of this very unpleasant complication is no doubt near the truth, as many surgeons of whom I made inquiry gave calculations which strike about the same average—that is, that in abdominal operations the occurrence of post-operative phlebitis is noted in about 2 per cent. I

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believe this to be expressive of a fairly conservative judgment, as no doubt many cases of a mild type are entirely overlooked, and then there is a class of cases which may properly be considered as of the same pathology, but which are not so readily demonstrated. I refer to those cases which, at the end of ten days or two weeks, begin to suffer more or less severely with intrapelvic pain, and about which no information is yielded to the examining touch, and which is generally termed "irritable stump," or a little later "adhesions," and the like, the individual being urged to be patient and to wait awhile, in the meantime tolerating massage and hot vaginal douches. After some weeks the symptoms disappear, and, while some uncertainty as to the pathology remains, it seems plausible to regard them as of phlebitic origin.

If such an untoward occurrence is to be met with in anything like the 2 per cent. which is pretty generally admitted, the subject certainly merits the serious consideration which it has of late been receiving. If the etiological factors once come clearly within our grasp, something practical in the way of prophylaxis may eventually be formulated, in which direction already much has been done that is encouraging. It is but a few years since any sort of inflammation or elevation of temperature following a surgical operation was fully accounted for in the mind of the conscientious surgeon by the one word "infection;" but to-day we know the matter is not so simple, and in many instances it is difficult to ascribe any influence in the production of phlebitis to infection; at least the bacterial invasion is in most cases only operative in conjunction with peculiarly inviting conditions of the blood.

The many conditions which are known to cause phlebitis independently of surgery have a direct bearing in this consideration when, as frequently happens, operations are performed on individuals who are the subjects of such disorders; for instance, phlebitis of syphilitic or rheumatic origin may develop during the convalescence from an operation with which there is no etiological connection whatever. Many cases of appendicitis which have been neglected develop phlebitis, and notably pyephlebitis with liver abscesses, are finally operated on, and the dire results are charged against the surgeon.

An individual may be the victim of a septic thrombosis, the result of procrastination, ready to become detached on the slightest disturbance of the affected parts, and carried into the portal circulation. The much needed operation is performed, the septic

charge is fired into the liver with disastrous results, and the luckless surgeon is again charged with little less than crime. We will all agree with Gerster that in such cases a thorough post-mortem examination is due the operator.

Phlebitis is sometimes the result, and in other instances the cause of thrombosis—the original clot depending upon either a change in the blood itself, or upon some damage inflicted upon the vein wall, whether from inflammation or traumatism. Going back to Hunter, we are reminded that “the fluid state of the blood is connected with the living vessels, which is the natural situation, and with motion,” and that when not circulating it is not subject to the same laws that govern the circulating blood. Slowing of the blood current, however, is not in itself sufficient to cause thrombosis, as Baumgarten has shown that healthy blood will fail to coagulate after many weeks, though shut off from circulation when confined between two carefully applied ligatures. We must evidently have some further departure from the normal conditions than mere slowing of the current in order to produce thrombosis.

An increased tendency to coagulation is noted in many debilitating diseases, such as tuberculosis, and following typhoid fever. There are also other circumstances not thoroughly understood that are the cause of blood changes which greatly increase the tendency to coagulation. Traumatism, damage of any sort, may be the determining factor in producing thrombosis; incisions, contusions, burns, suppuration of adjacent structures which thereby interfere with the integrity of the vein wall are all to be regarded as etiological factors.

Phlebitis, the result of infection, may undoubtedly exist without the formation of a thrombus, and conversely a sterile clot may be formed in a vein and give rise to no inflammation whatever. But, if changes have occurred in the blood favorable to the production of thrombosis, the inflamed vein wall will prove to be the determining cause of coagulation. And again, if a thrombus from any source, whether traumatism or disease, be in any degree infectious, a true phlebitis is sure to follow. Normal blood may tolerate a given amount of bacterial invasion without a resulting thrombus. It remains to be determined just what changes are involved which result in that state of the blood which is so prone to develop thrombosis when acted upon by the necessary trauma or the infection.

Wright of London has demonstrated that in the acute stage of

typhoid fever the coagulability of the blood is decreased—twenty minutes being required to produce the clot—while during convalescence the coagulability is greatly increased, the clot forming in $4\frac{1}{2}$ minutes. He also states that the blood of convalescent typhoid patients contains twice the normal amount of lime salts, and he points out that this is to be noted as the condition of the blood after a prolonged restricted diet, chiefly of cow's milk, which is more potent to produce this condition than is lime water. The suggestion is made (based upon several experiments) that the administration of citric acid as a decalcifying agent would, with some degree of certainty, reduce the coagulability of the blood in such cases. Thirty-six grains three times a day brought the lime salts below the normal and proportionately reduced the coagulability of the blood. If the fibrin ferment be shown to possess its dangerous efficiency only in the presence of an overcharge of lime salts, a step in advance will have been made.

Why the trouble occurs in the vast majority of cases on the left side is a question which is still not satisfactorily answered. In the case of the ovaries we account for the preponderance of left-sided disease on account of the proximity of the rectum. And some attribute as a cause of the frequency of left-sided affections in general the supposed lesser resistance of that side to the inroads of disease, believing that the greater resistance of the right side is a shield of safety. This theory, however, falls to the ground at least in arterial thrombosis, which occurs under a variety of circumstances, and with no predilection whatever for either side, the cases being of about equal occurrence in the two sides. The most plausible reason for the occurrence of the trouble so generally on the left side is to be found in the anatomical relationship of the pelvic vessels, the left common iliac vein passing beneath the right iliac artery, and apparently receiving pressure from this source. The prolonged recumbent posture, with slowing of the blood current, no doubt has much to do with the production of thrombosis, and there is considerable room to believe that much may be gained by allowing the patients to get out of bed earlier than has heretofore been the general custom. Dr. W. J. Mayo tells me that formerly phlebitis followed his abdominal operations in about 2 per cent. of the cases, but that since getting patients up and about by the end of the first week they have observed a reduction in the percentage to about one-fourth of 1 per cent.

In conclusion, it seems to me that we are justified in accepting as facts:

First.—Many of these cases are simply extensive aseptic blood clots, without any true inflammation.

Second.—An abnormal plasticity of the blood must be present in order that thrombosis may be the result of surgical traumatism.

Third.—The clot generally receives a mild form of infection introduced into the wound at the time of the operation, and in turn an invasion of the vein wall results.

Fourth.—As stagnation is such an important element in the etiology, getting our patients up earlier will undoubtedly reduce the liability to thrombosis.

Fifth.—As an abnormally high degree of plasticity of the blood is essential in developing the disorder, the blood ought to be tested by some recognized standard in every case, and, if found in a dangerous state, operation should be postponed until medication shall have brought it back to a normal condition.

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DISCUSSION.

DR. HERMAN E. HAYD of Buffalo, in opening the discussion, said there must be great susceptibility on the part of some women or men to phlebitis following operation, or it would not be so common after the most trivial undertaking. One of his patients, a woman, was in bed now with a postoperative phlebitis, he having operated on her four weeks ago for a simple recurrent attack of appendicitis. The wound healed kindly, without any evidence of irritation or pus. The woman was also married and sterile, but was anxious to have a child. He examined the ovaries and tubes and found they were healthy. He dilated the cervix and put in an intrauterine stem. The vaginal work was done with just as much care as the work from above. The stem was thoroughly boiled. There was no possibility of infection having occurred in this case—at least, it was not evident to him. He did a curettage before he performed the appendix operation, so that his hands were perfectly sterile for both operations. He used gloves for the vaginal work, and the same pair of gloves for the abdominal. The woman left the hospital in two weeks, walked upstairs to her apartment, and the next day complained of pain in the calf of the leg. He was immediately suspicious of phlebitis. A couple of days later the left thigh was two and a half inches larger than the right. He thought the phlebitis came from the vaginal work and not from the appendiceal operation. It was possible, however, that it might have come from the other. He cited the case to show that after such a trivial undertaking as a curettage and the introduction of a stem, under the most careful precautions, phlebitis had resulted, and probably this woman would have to remain in bed five or six, or eight weeks.

DR. JOSEPH PRICE of Philadelphia said that whenever much "acrobatic surgery" was done, postoperative phlebitis would occur. He had noticed that in certain institutions, where a great deal of prominence was given to binders, crutches, and the use of retractors, there was a large number of cases of postoperative phlebitis. He mentioned one institution where retractors and other instruments were used freely, in which there were 48 cases of phlebitis, 25 of ileus, and 18 of ether pneumonia. He had not had a case of phlebitis for five or ten years. Really, he hardly knew what it was, and it pained him to hear men talking about the early rising or getting up of patients, which was so commonly practiced. He regarded this early getting up as a variety of criminal assault on patients. Phlebitis was common in some hospitals, but very rare in others.

DR. ROBERT T. MORRIS of New York said that he had had two instances of left-sided phlebitis after operation on the appendix. It was difficult to explain the occurrence of left-sided phlebitis in these two cases.

DR. JAMES F. BALDWIN of Columbus asked if the members had not seen phlebitis occur in cases in which no operation had been made for appendicitis.

DR. MORRIS replied that he had seen it in cases without infection. In the two cases mentioned there was no infection apparently. They were interval cases.

DR. BALDWIN said that some years ago he was called to see a case of appendicitis in consultation in a young boy. In this case the phlebitis was on the left side and ran its usual course. The trouble about the appendix had subsided.

DR. JOHN W. KEEFE of Providence, R. I., said that very little was known as to the cause of phlebitis following operations. He cited an instance of hernia in a woman for whom he did a Bassini operation. The operation was clean; it was done in fifteen minutes, but a left-sided phlebitis occurred, and within two weeks a right-sided phlebitis followed. At no time was there any suppuration or redness about the hernial wound.

DR. EDWARD J. ILL of Newark, N. J., said he wished to make a confession. For a number of years he had had no cases of postoperative phlebitis, and then there were eight that came in succession in one winter. These cases were operated on in different hospitals and in private practice. Not one of his assistants had had a single case of phlebitis following operation. He took it upon himself to investigate the cause of it. He thought he operated cleanly and more quickly than any of his assistants, and still there was postoperative phlebitis. He believed it was a septic condition, for he had seen it follow five weeks after a simple appendectomy. What the nature of it was he hoped to learn some time, but at present he did not know. It might be that it was the peculiar condition of the blood which had been referred to by the essayist which was going to help us out. However, he thought that surgeons had better look to themselves.

DR. HUGO O. PANTZER of Indianapolis, commended the paper for its clear and convincing arguments. He took exception to the early rising of patients after an infectious disease. Most cases of phlebitis were certainly aggravated as soon as patients got up, as in some the phlebitis did not develop until they began to sit up.

DR. PFAFF, in closing the discussion, said he was a little surprised to hear that Dr. Price had not had a case of phlebitis in ten years. This made it incumbent upon the rest of surgeons to obtain approximately the same result, or it would be their own fault. He thought certain factors in the etiology were going to be cleared up, as Wright was too good a man for practitioners to consider lightly any statements he might make. Traumatism was inevitable in all cases. Sepsis was also inevitable, and yet it was not always the septic cases that gave us phlebitis. It was the simple, easy cases, as for instance where a surgeon had done a fifteen-minute abdominal section, had inflicted no traumatism, and yet phlebitis followed.
