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## A Contribution to the Operative Treatment of Puerperal Pyæmia, with Report of a Successful Case.\*

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THE clinical picture presented, when septic processes dependent upon micro-organisms—generally streptococci—having their seat in the endometrium spread to and involve the pelvic venous plexuses and the large veins leading from them, is a somewhat varying one. This variation depends, as is always the case in infection, on the site and extent of the structure affected, and on the virulence and quantity of the toxin at work. The not uncommon condition of “white leg,” produced when such virulence is of comparatively small magnitude and the process is limited closely to the affected veins, is an example of the mildest form of vascular infection. Contrasting markedly with such a condition is the one presented by what is clinically known as acute puerperal pyæmia, when virulent micro-organisms invade the veins of the pelvis and within two or three days produce a condition of the utmost gravity. With frequent severe rigors and extensive fluctuations of the temperature curve, marking the periodic flooding of the system with toxins, with rapid and feeble pulse and marked prostration, the patient gives very obvious indications of the seriousness of the mischief taking place in her pelvis. Here the toxicity of the invading organism is such that not only is thrombosis taking place and extending rapidly in the pelvic veins, the ovarian plexus, the internal iliac and the common iliac veins, and thence downward to the femoral vein and upward to the vena cava, but also changes in and destruction of the vein walls themselves, leading to the outpouring of septic material into the connective tissue and peritoneum, rapidly produce abscesses and peritonitis. Quickly, too, from the infected blood-stream arise

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metastatic processes elsewhere, and death rapidly and almost without exception closes the scene.

Between these two extremes, but often with difficulty separable from the latter class of cases, clinically at any rate, we have those cases which, often distinguished by their later onset, their more extended course, and their slower effect upon the general condition of the patient, are described as subacute or chronic pyæmia. In such a patient one or more days after an abortion or confinement there supervenes an endometritis, with raised temperature, quickened pulse, local tenderness, and unhealthy discharge. As this is subsiding or has apparently disappeared—for days or even weeks may have passed since the original infection—symptoms of septic trouble come on the scene. Rigors, repeated daily or with intervals of two or three days at first, marked oscillations of temperature, profuse sweats, quick pulse and a change for the worse in the patient's condition indicate the onset of this new and serious state of affairs. As a rule these symptoms are prolonged over many days, often weeks, and beyond the increasing feebleness of the patient and perhaps evidence of some cellulitis in the pelvis or localised abscess, no other symptom arises. But, as has been said, the boundary line between these cases and those more acute ones is a slender one. The disease may start within a few days after delivery and extend over many weeks, or it may start late and be quickly followed by secondary septic trouble in the lungs or heart. Death follows almost without exception in the acute cases—almost certainly if there are remote septic foci.

The mortality of the more chronic cases is also considerable. Bumm, drawing upon the large practice of the Charité Hospital, in Berlin, observed 23 such chronic cases with late onset and prolonged course in recent years; of these no fewer than 19 died after a more or less prolonged illness. It is generally accepted that the more chronic the case and the longer the period during which the disease has lasted, the more likely is recovery to result. But to this rule there are many exceptions. Exhaustion with or without the concurrent development of metastatic processes may lead to death, even after weeks or months.

Those cases in which an abscess arises in the course of the disease, whether the abscess be in the pelvis or in a joint or situated subcutaneously, are believed to have a better chance of recovery than those which run their course abscess free. Indeed Fochier of Lyons, in 1891, struck by this undoubted clinical fact, endeavoured to imitate nature and produced abscesses artificially by the sub-

cutaneous injection of turpentine. Fochier's supposition that such artificial abscesses produced their effect by attracting to themselves the micro-organisms has since proved to be wrong, for abscesses produced in this way are sterile; but, be the reason what it may, several successful cases have occurred, Fochier, in 1891, and Menko, of Amsterdam, in 1899, recording the recovery of two acute cases after this treatment. Of the four cases which recovered in Bumm's series of 23, two had developed abscesses, and a third had one produced by Fochier's method.

But the futility of the methods of treatment generally employed, and a consideration of the success which had followed the cutting off from the general circulation of similar infectious venous foci in other parts of the body in general surgical practice, for instance, in lateral sinus and jugular vein thrombosis following middle ear trouble, led surgeons to advocate a similar line of action in the cases under consideration. In 1894 Sippel advocated not only extirpation of the uterus, but a simultaneous excision of as much of the affected veins as possible. This suggestion was put in practice by Freund in two cases, but with fatal result. Trendelenburg and Bumm followed with four and three cases respectively, but again with failure. Trendelenburg modified the suggestion, and tied and cut the right internal iliac vein by an extra-peritoneal operation, and this not allaying all the trouble, he tied the right ovarian vein, and saved his patient. So the first success had been scored, and another step gained. In 1902 Dr. Ernst Michel, by a similar method in a bad case, saved his patient. Bumm, in a recent paper,<sup>1</sup> has recorded five cases, with three successes and two fatal results. One of the successful cases was in a patient with pyæmia. Besides recording these cases this paper contains the most complete review of the subject up to date. A shorter paper<sup>2</sup> by Haeckel of Stettin, reporting another success, brings the record up to date. Both these surgeons tied the thrombosed veins—internal iliac veins generally, and after them the ovarian veins if necessary, working through the peritoneum by a laparotomy.

To the six successful cases so far recorded I desire to add the following case, which came under my care recently:—

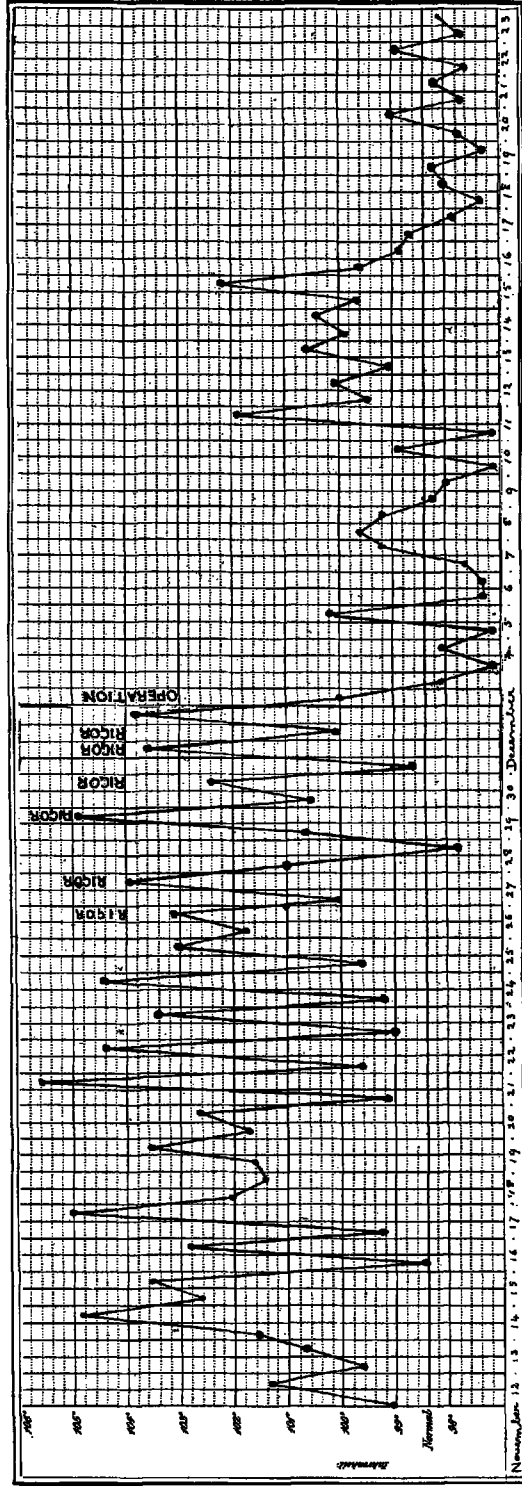
S.B., æt. 30, was attended in her confinement by a midwife on November 6th, 1905. The child was a large one, the placenta came away with ease and apparently entire, and the perineum was not torn. Two days afterwards (November 8th) a rigor, followed by profuse perspiration, occurred. On Nov. 10th Dr. J. H. Wilks was called in, and to him I am greatly indebted for these notes of the

confinement. The temperature was then  $104.8^{\circ}$ , pulse 126, respiration 36. There was no uterine tenderness, and the discharge was not foul. A biniodide of mercury douche was given. The temperature not coming down, on the 11th the uterus was curetted under chloroform, a few small shreds of placenta being removed. Every day the temperature rose considerably, and the sweats continued. Anti-streptococcic serum was injected on November 14th, 15th, 16th, 17th and 19th, but made no appreciable difference. The blood was examined, but not very successfully; there appeared to be cocci present. On November 21st the temperature was  $105.6^{\circ}$ , pulse 132, respirations 26 at 8 p.m., and on this day a doughy lump, about the size of a fist, not very fixed, was apparent in the right iliac region. A vaginal examination showed that this lump was in the upper part of the broad ligament.

On November 22nd she was transferred to the Sheffield Royal Infirmary under my care. The patient was a thin, emaciated woman, with sallow complexion, dry lips and coated tongue; a rapid feeble pulse and a clammy skin. The abdomen was somewhat distended, but perfectly soft and practically free from tenderness. The lump in the pelvis on the right side was easily palpated, more convex behind than in front, movable, and bimanually was made out to be in the broad ligament, as stated above. The patient took her food fairly well, and slept well. The temperature rose every evening to varying heights, as shown in the chart. There was slight diarrhœa.

About the 25th a slight rigor was noticed at night; and, increasing in intensity, one occurred each day—generally towards evening—following. The pelvic lump, if anything, slightly lessened in size. Sweating continued. It was very obvious to all observers that the patient was now going down hill quickly, and, judging from the symptoms, that thrombosis of the pelvic veins with surrounding œdema—possibly pus in the broad ligament—was present, just as one sees in some cases of thrombosed varicose veins of the leg. I therefore determined to explore and deal with things as circumstances might direct.

The patient having a temperature of  $100^{\circ}$  and a pulse of 120, median laparotomy was performed on December 3rd, at noon. In the right broad ligament was a moderately firm mass, the thickness of three fingers, stretching from the uterine wall internally to the pelvic wall externally. The ovary and tube on each side were normal. Having taken the usual precautions to pack off the intestines, an incision was made over the mass in the broad ligament, and this revealed only a thick bundle of thrombosed veins. The incision was



Temperature Chart of Mr. Cuff's case of Puerperal Pyæmia.

extended internally and externally, the peritoneum reflected and a ligature of strong catgut placed on the uterine side, a second being placed further out towards the pelvic wall. In tying the last I discovered that rising out of the pelvis was a thick thrombosed vein—the ovarian. This was easily followed up to where, just below the kidney, it joined the vena cava. A strong ligature was placed on it about half an inch from this junction, the peritoneum having been previously incised and reflected. There was a considerable thickness of indurated cedematous tissue around the vein the whole way. The peritoneal incisions having been closed with a catgut suture, the abdominal wound was closed entirely in the ordinary way. That night the patient was comfortable; pulse 100, temperature 98°. On December 4th the temperature was subnormal all day. On the 5th it rose a little to 100·2°, and afterwards varied, as the chart shows, for some days, finally becoming normal on December 17th. The patient had no rigors after the operation, but seemed to have slight sweats for several days. In the first week she declared herself very comfortable, and slept and ate well, then for three or four days she complained bitterly of pains in her left knee and hip joints, but with no physical signs in the joints or in the pelvis.

The patient left the ward well and fairly strong, and reported herself to me in February, 1906, as “quite well,” and able to do her housework and look after her children.

The above case may, I think, fairly be called one of subacute puerperal pyæmia, and that her life was saved by this operation, devised and perfected through failure and success by Trendelenburg, Freund, Michel and Bumm, I think, is more than probable. Rigors commenced within three weeks of the initial sepsis, and before their onset the temperature chart shows the gravity of the condition present.

Such cases are happily not common, but when they do occur surgery seems now to have made yet another step forward, and to offer in this operation a very definite hope of cure. There occur some instances in which the uterus itself is badly infected; its walls are impregnated with germs. Obviously in such a case mere ligature of the veins does not seem likely to offer any hopeful result. There are other cases so acute in their onset that before one can make up one's mind as to the true nature of the condition the process has advanced so rapidly and extensively that no justifiable or feasible operation can be performed; little, too, can be done when septic foci are present in the heart or lungs. But, granted that one can make a probable diagnosis of septic vascular thrombosis, be it in an

acute or chronic case, and especially if one can exclude the more grave contra-indications alluded to above, this operation will undoubtedly be the treatment of the future. The difficulty of making a sufficiently early diagnosis for treatment in the acute cases will possibly always militate against very good results. Every rigor occurring early in the puerperium does not by any means indicate the serious thrombosis of veins, and by the time that the diagnosis is settled the time for successful operation may have gone by. The more chronic cases give more time for consideration; they all run on much the same lines as far as symptoms are concerned, pointing to the probable condition, and from their longer and slower course offer much more chance of a successful intervention.

As to what should be the precise indication to operate, future experience will alone show more clearly. A localized morbid condition, made out by palpation in the pelvis, may surely always be said to suggest the necessity of exploration when occurring in a case of grave illness. Whether to operate by the extra-peritoneal or trans-peritoneal method will, too, require more experience to settle. To reserve the former for the acute cases when one may suspect pus, and to use the latter for the more chronic cases seems to be the trend of opinion at present. Personally, I think that the peritoneal route offers more advantages than disadvantages for careful work in all cases, and objections as to sepsis can in a great measure be met by suitable precautions.

Why the ligated and enclosed clot in the veins gives no further trouble after the operation is an intensely interesting point, but its consideration belongs more to the realms of pathology, is bound up with the theories and facts which relate to the strengthening and weakening of the amount of antitoxic bodies produced by the blood and its leucocytes, and their varying behaviour towards free or encapsuled septic foci; and its consideration would take us too far afield. That it may give no further trouble is shown by many of the successful cases. It is possible that an abscess *may* arise, but no case of the kind has yet been recorded. In Michel's case the blood-clot was breaking down into purulent mass before operation, and was drained extra-peritoneally. The rise of temperature at odd times after operation is noted in all cases. By no operation can one cut off every channel of absorption, indeed in one of Bumm's cases very slight rigors were noted once or twice after the operation.

#### REFERENCES.

1. Bumm. *Berliner klinische Wochenschrift*, July 3rd, 1905.
2. Haeckel. *Deutsche medicinische Wochenschrift*, October 12th, 1905.