you here see—a simple elastic tube which can be coiled three or four times round the extremity, and is then rolled up the limb when worked by these handles. I do not know that there is absolute novelty in this proceeding. It attracted little attention when brought before the surgeons at Berlin, probably because others had had somewhat similar experiences, as I am told Mr. Clover in this country has had; but Billroth, to whom I am indebted for an obliging note on the subject, has warmly advocated it, trying it, amongst other cases, in an amputation at the hip, the final compressing band being carried round the perineal and gluteal regions, but, in this instance, without success (*Wiener Med. Wochenschrift*, July 19, 1873). The cases in which it seems best to answer, or in which the practice, advocated in Edinburgh, of raising the limb before operating, and, after the blood has run out, placing a tourniquet on the main artery, are such as operations upon carious bones of the foot, or cases of necrosis of the bones of the leg or arm. In one instance, Dr. Hermann Weber informs me, it was useful in this way—in cutting through an os calcis, the bone, pale from abstraction of its blood, was seen to be laden with tubercular deposit, and the operator, deciding that such bone had better be removed, converted the intended Pirogoff into a Syme amputation. You will notice that in using Mr. Cripps's apparatus it is desirable to pad the popliteal space, so as to ensure pressure upon the artery, as the elastic tubing coils along this portion of the limb.

As the catching term associated with it of "bloodless operations" is likely to lead to a very general use of this arrangement for lessening the loss of blood, you ought to have in mind that there are some conditions for which it is doubtful if its use is desirable. Cases where there is any suspicion of local vein-disease are, I think, of this class; so, too, are cases in which primary amputation is required for crushing of tissues, as in such the torn veins are closed with clots which might possibly be displaced by the compressing bandage, and so pass into the larger vessels, causing embolism; and so also are cases of gangrene, or cases of rapidly extending cellular inflammation; at least, I may say this, that I should not be disposed to use it in such cases, or to recommend its employment. There is, however, no reason to suppose that it engenders risk of after-sloughing of parts, as of the skin flaps of amputations. Billroth, in fourteen cases, had no such consequence to report, nor has any such been heard of in our own experience of its use. Billroth's expectation that the compression might prevent pain has, however, been tested by him and has failed, the patient suffering greatly during the operation. But in quite another direction as a compress in the immediate treatment of poisoned wounds, it is not improbable that it may be serviceable.

Well, gentlemen, such are some of the means you should employ to save all the blood you can from being lost to your patient during an operation. You may ligature vessels before your operation proper is begun; your assistant may check bleeding by the use of compresses, or you may twist each vessel as it is divided, whether it be artery or vein; you may, in great part, empty a limb of blood by elevating it, or, better still, by using Esmarch's elastic bandage; and beyond these means you have an effectual preventive of waste of blood in the finger of an assistant, or by using a tourniquet for compressing a main arterial trunk.

The tourniquet is invaluable, if only it be properly applied; for, indeed, its application is by no means so simple a matter as, at first sight, it may appear to be. Speaking now of its scientific use, not of the rough appliances which, on an emergency, a surgeon may find himself justified in using, I would say that it should be employed only, or with rare exceptions, for the compression of the common femoral or external iliac (for these vessels, so far as tourniquet pressure is concerned, are needlessly distinguished by separate names), and for that of the abdominal aorta, and even for the first of these compression made with the finger is infinitely preferable. For all operations about the upper extremity the artery should be secured by the finger of an assistant; at least such is my practice; for, in such cases, a tourniquet is with difficulty applied so as to avoid pressure on veins and nerves, on veins more especially. Now, suppose you have to control the femoral as it turns over the pelvis, you take this Italian tourniquet and secure the large flat pad firmly by placing it beneath the tuberosity of the ischium; if the lesser pad be then lowered by the screw, it will fall with very little manœuvring over the femoral artery. You have no business to press this vessel as it passes through Scarpa's triangle, first, because, from lack of counter-resistance, you will find it difficult to control its pulsation; and, secondly and chiefly, because pressure here will also compress the vein or veins which lie beneath the artery, and this would occasion great waste of blood when the chief venous trunks come to be divided; you must then direct your compress so as to push the common femoral up against the bone as the vessel comes out from the pelvis; or, if you direct your pressure downward, it must be made over the external iliac

as it reaches the bone surface. But you must attend to yet another point: the pad of the tourniquet is always larger than suffices to cover the area of the artery; so you take a piece of lint, and fold it so as to make a compress the size of your index finger, and an inch or more in length, and you place this over the exact course of the artery. This is not so good as finger pressure, but it is the next best thing to it; and, when the moment comes for controlling the vessel, you will do so without affecting the flow of blood through the adjacent vein, and will consequently have done the best towards preventing undue loss of blood. And this precaution holds good yet more clearly for tourniquet pressure on the abdominal aorta, which is the vessel you control for amputations high up in the thigh, and for amputations at the hip joint. On two occasions on which I have applied the tourniquet for amputation at the hip, there has been scarcely any blood shed. You have to recollect the position of the vessel and that of the vena cava ascendens. On the front of the abdomen, the umbilicus gives a landmark, immediately below which the pressure is to be made, so as to fall upon the artery just above the origin of the iliac vessels. Higher than this it is not safe to go; there you come to the large branches given off to the intestinal canal; there lie the duodenum and the pancreas, and there, too, is the great network of nerves, with their ganglia, which are distributed to the viscera, and I have known hurt from pressure upon these structures; and in one case, in which the tourniquet was applied for some time for the treatment of an aneurism, some of the structures I have referred to were irreparably damaged. The line of pressure, too, should incline to the left side; you may thus command the artery, and you will avoid the vein. If you do not keep clear of the vena cava, there will be a gush of blood, when the operator divides the vessels of the thigh, from the entire iliac system of veins, which will be with difficulty restrained whilst the operation, including the securing of the vessels, is being completed.

By considering the requirements of each case, you may be sure you will be able, by some one or other of the means now referred to, to perform any operation with little loss of blood—certainly without waste of it; and, if your patient is to convalesce well and speedily, this is one detail not to be lost sight of. The stopping of bleeding, however, has yet further to be thought of; you have to secure a wound against recurrent bleeding, and you have to make sure that there shall be no secondary hæmorrhage. Here comes in the question of how bleeding may be stopped so as to ensure for a wound subsequent rest and ease.

ON THE PREVENTION OF UTERINE INFLAMMATION.*

By E. J. TILT, M.D.,
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I SHOULD think it waste of time to discuss that the most frequent cause of uterine inflammation is to be found in parturition and in abortion; the more so, as this professional conviction tallies with the patient's generally referring a serious attack of metritis to "a bad getting up" or to a bad miscarriage.

1. What are the symptoms of a bad getting up and of a bad miscarriage?
2. What are those organic lesions of a bad getting up, that lead to uterine inflammation?
3. How to prevent a natural function becoming a frequent source of metritis?

Such are the questions that I propose to briefly examine.

1. *What are the symptoms of a bad getting up?* General debility, showing itself in various ways, notwithstanding a fair amount of rest, food, and stimulants; an inability to stand or walk a few steps without feeling ready to drop; a sensation of bearing down and of uneasiness, rather than of pain, in the pelvis; the persistence of an abundant vaginal discharge, particularly if it be bloody or muco-purulent, three or four weeks after parturition, when the lochial discharge ought to have ceased. When such a disturbance of health arises in the midst of other circumstances or without known cause, it excites alarm, and is carefully investigated, but, because it has been clearly caused by parturition, the case is often inadequately attended to by the medical attendant. Change of air and tonics are the only things he recommends. The vaginal discharges are not inquired into; they are set down as leucorrhœa; and he does not even examine to ascertain, whether perchance the symptoms may not be caused by the inability of the womb to get

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back to its proper size. The patient doubtless improves by tonics or the seaside, but frequently the benefit is not permanent; and either menstruation becomes too painful and too abundant, or there is a bad miscarriage or a succession of miscarriages; and, after several years of this kind of life, the patient is only cured when she meets with a practitioner who will take the trouble to ascertain what is really the matter. This is the plain account of what I have very frequently observed; and now, what would the medical attendant have found, if he had carefully examined such a patient, one month or longer after her confinement?

2. *What are those organic lesions of a bad getting up that often lead to uterine inflammation?* They are: *a.* Defective involution of the womb; *b.* Placental ulceration of the uterus; *c.* Contusion of the uterine tissues; *d.* Rupture of the uterine orifices.

a. Defective Involution.—As many medical men consider it wrong to investigate the causes of a bad getting up, we do not know more of defective uterine involution now, than when Sir J. Simpson wrote about it in 1852. I do not think obstetricians will, however, contest that this want of tissue-transmutation power may be caused by hypercongestion or subacute inflammation of the uterine tissues, or by inflammation of some pelvic organ, generally the peritoneum; that it is very frequent; and that it may last for years, yielding only to the menopause. One other point with regard to defective involution has not been noticed—the fact of its being the substratum of other uterine diseases—the stuff, as it were, out of which they are made—the soil on which they grow. It is the obvious cause of the too abundant and too prolonged discharges of the period that follows parturition. Not itself inflammatory, defective involution may lead to catarrhal inflammation of both uterine mucous membranes; and it enlarges the size of any ulcer that may form where the placenta was attached, thus causing one variety of internal metritis. Defective involution is the main cause of the displacements that so frequently follow parturition. I can now do little more than express my conviction that this condition is the first step to many uterine affections; and surely it is not reasonable to ask a medical man to make a careful examination of the size of the womb, towards the close of the puerperal month, when he finds that his patient is making a bad recovery. He would often find the womb double or treble its proper size; its external mucous membrane congested, sometimes excoriated, a wax bougie easily slipping in, through patulous openings, to a depth of from four to five inches, instead of being brought up at two and a half inches.

b. Placental Ulceration.—The ulceration of that portion of the mucous membrane to which the placenta was attached is a comparatively rare disease, but it should be mentioned as one distinctly originating in parturition. This form of endometritis is marked by the presence of an indolent ulcer covered by pulpy granulations—the “fongosités” of Recamier—the roughnesses felt by Dr. Atthill, before he swabbed them with nitric acid, in one of his cases. This ulcer is generally situated in the posterior surface of the uterine cavity, where the placenta generally attaches and has been so frequently met with after bad labours, in which it was necessary to peel away the after-birth, as to justify the belief of Stoltz of Strasburg and my own, that the disease can be accounted for by the laceration of the internal surface of the womb. The fact of having been obliged to tear away the placenta should be, therefore, an additional reason for ascertaining whether the womb be defectively involuted; for defective involution often coincides with placental ulceration, and, by enlarging its area, leads to the flooding of this form of endometritis.

c. Contusion of the Uterine Tissues.—One may admit the wonderful recuperative power of the puerperal womb without ignoring the cases in which the uterine tissues have been so bruised that the usual tissue-transmutation changes are checked, and others set a-foot that lead to defective involution or to well marked cervical ulceration. At all events, should delivery have been a tedious one, it is the duty of the accoucheur to examine his patient at the end of the puerperal month, if there be uterine symptoms and her general state be unsatisfactory.

d. Rupture of the Uterine Orifices.—It is beyond doubt that, during labour, the os uteri is often lacerated in one or more portions of its circumference. This was contested by no one, in a recent discussion at the Obstetrical Society of London; and Dr. Phillips even estimated the occurrence of cervical ulceration during parturition at 10 per cent.; and he considers the percentage to be much larger after tedious labours. Most of these ulcerations heal by first intention; and they give to the end of the cervix a stellated appearance, of which the os uteri occupies the centre; or else there is a rather deep sulcus descending from one or the other angle of the os uteri. Sometimes I have seen the end of the cervix made up of angular projections divided by deep furrows, the os uteri being found in some out-of-the-way situation at the bottom of one of these furrows. In such cases, there was

always a history of forceps-delivery by incompetent hands. It seems to me that an accoucheur is thoroughly wanting in his duty if, before giving up his attendance, he omit to make a speculum-examination whenever a voluminous child has been suddenly expelled from the womb, and the mother is not recovering well after confinement.

I use strong terms, because I thoroughly go with Dr. H. Bennet in his belief that, in sickly women, some of the worst cases of chronic uterine inflammation have their origin in the unhealed portions of these lacerations, which put on an unhealthy appearance. Before quitting the subject, I note that Dr. Botrel of Rennes has sometimes observed the evident rupture of the circular fibres of the internal os uteri in women who died of puerperal lymphangitis a few days after delivery.

You will have remarked, gentlemen, that in discussing those organic lesions of a bad getting up that lead to uterine inflammation, I have only had parturition in view; and I must now show how far, in this respect, it differs from abortion.

There is less traumatism in abortion than in parturition to account for the rise of uterine inflammation; but I believe abortion to be more frequently followed by defective uterine involution. I explain this, by the fact that women resume the duties and pleasures of life too soon after miscarriages, and by the recurrence of the menstrual orgasm before the womb has recovered from the traumatism of abortion. The enlarged womb having thus become a centre of conflicting tendencies, I can understand its becoming permanently over-sensitive and congested, and such conditions merging into inflammation in weakly constituted women. At all events, abortion figures so largely in the etiology of long continued uterine disease, that, when investigating a bad case of metritis, in married women, I always expect to find it caused by a bad miscarriage or by a succession of abortions.

3. *How to prevent a natural function from being a frequent source of metritis.* If I have correctly estimated the organic lesions that are the frequent results of parturition and the no less frequent causes of uterine inflammation, its prevention is a logical sequence. Speaking generally, all improvements in midwifery, such as the judicious shortening of labour, by the skilful use of the forceps, will prevent the development of metritis by diminishing traumatism and by husbanding the strength of the womb for the completion of perfect involution. I therefore assert that the Obstetrical Society of London has done good work during the last few years, in pressing on Government the urgency of providing for the better education of midwives. Mr. Stansfeld's appreciation of the importance of this question gives hope that it might soon be brought to a satisfactory settlement, if the sister societies of Edinburgh and Dublin would give us their valuable support, by petitioning Parliament and memorialising Government. In like manner, the spread among medical men of more correct knowledge of diseases of women will ensure the early recognition of such of them, as may interfere with the recovery of health after parturition, so that they may be nipped in the bud. You will, I am sure, agree with me that, under the present rules of medical education, too little time is allotted to the study of midwifery and of diseases of women and children; and it can scarcely be doubted that this time would be ultimately extended, if the three Obstetrical Societies of the British Empire were to urge the extension on the Medical Council, Colleges, and Schools.

Turning to measures that lie within the immediate scope of every one of us, I shall proceed to exemplify the advice I have already given in my *Handbook of Uterine Therapeutics*. Three sets of women require somewhat different advice—1. Pregnant women who have previously been under treatment for uterine inflammation; 2. Women who are not making good recoveries from parturition; 3. Women who have miscarried.

1. When pregnancy occurs soon after the surgical treatment of uterine inflammation, or during the course of such treatment, it is best to leave it off, with the exception of a vaginal injection once a day if there be a leucorrhœal discharge. Such women should pass the puerperal month in bed or on the sofa; they should use a vaginal injection with a solution of acetate of lead, twice a day, so soon as the lochia cease to be red; and, should this continue to be the case for more than eight or ten days after parturition, they should direct the practitioner's attention to the fact. All such women should submit to a speculum-examination at the end of the puerperal month, in order to ascertain whether parturition has led to a relapse of cervicitis, because it most frequently does so.

2. When, without presenting signs of the more serious puerperal diseases, a patient is recovering badly from labour, the practitioner should ascertain the progress of uterine involution; and, if it be not progressing sufficiently quickly, he should put on a grave face, discountenance getting up, apply a tolerably firm abdominal bandage, and give ergot. Should the vaginal discharge continue red, it is better not to depend on sulphuric acid and astringents, but to make a digital ex-

amination; and, according to what he finds, he will order injections with acetate of lead, with alum and zinc, or with one of the infusions of vegetable astringents that Dr. Wiltshire has recommended in the third number of the *Journal of Obstetric Medicine*. If, at the end of the puerperal time, a woman remain weak, notwithstanding a fair amount of food, of stimulus, and of tonic medicine, if she cannot stand or walk a little without bearing-down sensations and back-pain, if she have still a red or a muco-purulent vaginal discharge, it would be folly on the part of an obstetrician to permit connexion, and to merely recommend change of air, without ascertaining what is really the matter with his patient. It is a great point to get a few months of rest from menstrual orgasm for a womb that has recently suffered from inflammation, or shows a leaning thereto; so I encourage nursing, provided the child do not suffer from lack of maternal milk or from its poverty.

3. It is the absence of some definite understanding between the profession and the public respecting the rules to be adopted after abortion, that renders it a fertile source of metritis. It is well understood by all women placed above the obligation of manual labour, that the month following parturition should be a period of convalescence, during which the wife should sleep apart from her husband. There is no similar understanding with regard to abortion; women think it right to get about so soon as they can possibly do so, and thus encounter influences that often check the process of involution. I am convinced that uterine inflammation would be frequently prevented by our persuading the public that a month's convalescence is not too much for even a moderately bad miscarriage, during which time matrimonial sequestration should be enforced. Even when there be no *post partum* flooding or signs of severe pelvic inflammation, and in ordinary cases of miscarriage at from three to five months, I should advise a practitioner to act very much as he would after a confinement. His object should be to keep his patient in bed or on the sofa for a few weeks. He can do so by talking seriously of miscarriages being worse than confinements, and of the great danger of one abortion being followed by others. There is often a considerable amount of cervical inflammation and of vaginitis about an ordinary miscarriage; so, as a rule, a miscarriage should be treated as a case of inflammation. Rest in bed is the most important means of cure. Warm linseed-meal poultices to the abdomen are most useful when they do not too much increase the blood-flow. Linseed-tea or poppy-head vaginal injections are very useful during the first week, and then injections made by adding one drachm of laudanum and of acetate of lead to the pint of tepid water. Supposing this to have been done, and the patient to have gradually resumed her usual mode of life, if there be then back-pain or pelvic pain on slight exertion, a discharge staining the linen yellow, and debility in spite of tonic treatment, then it behoves the medical man to warn the patient and her friends that he suspects that his best efforts to ward off metritis have only been partially successful, and that he ought to carefully examine the patient, to ascertain what is the real state of the case.

You all know how to treat internal metritis, and inflammation and ulceration of the cervix; the treatment of defective involution is far less satisfactory, so it must not be passed over; and, in the first place, unless it be detected and cured, in the three months that follow parturition, you will greatly increase the difficulty of doing so. It may be cured by a subsequent pregnancy, but not always; and it should be cured at once, if possible, for there is no telling what may occur to a woman with the body of the womb large enough for the sound to enter to a depth of from four to five inches. If there be the slightest doubt of active congestion in the womb, I apply leeches to the cervix, I give ergot, I order the lower part of the abdomen to be painted once a day with Mr. Marshall's oleate of mercury, and I always recommend acetate of lead injections, twice a day, if the mucous membrane be congested or excoriated, once a day if it presents nothing amiss. I do so because I know health to be just as contagious as disease, and that healthy action passes from a superficial to the underlying tissues; and my belief in the great value of well-made, long-continued vaginal injections is not in the least diminished by the little value allowed to them by other authorities. When defective involution has a longer date, in addition to measures previously mentioned, I try a cold water abdominal bandage, rather tightly applied; iodide of potassium internally, and tincture of iodine to the cervix: moreover, I do not discountenance connection, but it is obviously better to prevent the call for these tardy remedies, by following the rules I have laid down.

It is by this judicious management of lying-in women, and of those who are recovering from abortion, that you will persuade the womb to resume its proper size; that you will allay uterine irritation, reduce congestion, heal cervical lacerations, cure placental ulceration, check the recurrence of abortion, and thus stamp out uterine inflammation in its origin, or greatly diminish its acuity and duration.

ON THE ANTICIPATION OF *POST PARTUM* HÆMORRHAGE.

By LOMBE ATTHILL, M.D.,

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THE BRITISH MEDICAL JOURNAL for September 27th contains Dr. Whittle's paper on The Anticipation of *Post Partum* Hæmorrhage, which, though read just before the hour at which the Section adjourned, was listened to with great interest, and at the conclusion of which a short but animated discussion followed—a discussion in which the lateness of the hour when it occurred prevented several members from taking a part, and which unfortunately has not been published. The reason why this paper was listened to with such attention is obvious: every practitioner present, from personal experience, dreaded *post partum* hæmorrhage; and, while admitting the value of transfusion in extreme cases, rejoiced at the prospect of not being obliged even to think of such a troublesome, often difficult, means of saving life. Indeed, more than one member, during the debate which had previously taken place on transfusion, asked, "Could no means be suggested for rendering this operation unnecessary, by preventing *post partum* hæmorrhage from occurring?" Dr. Whittle's paper professedly is a reply to these queries; but, while admitting the value of his observations, it is, I think, important that the subject should be discussed more fully; otherwise I fear that many may be led into what will prove, in some cases at least, but a false security, by relying on one mode of treatment which, while often most valuable, is as often inefficacious.

In the first instance, I may remark that the value of the administration of ergot as a preventive in cases of anticipated *post partum* hæmorrhage has been long taught in the Dublin School of Midwifery. Not a session passes in which the practice is not impressed on the classes attending our lying-in hospitals. And the question as to the means to be adopted in cases in which *post partum* hæmorrhage may be expected, will be found over and over again in the printed papers issued by myself and other examiners to candidates seeking the licenses of the College of Physicians.

The questions I would raise in the present instance are these:—

I. What are the causes most commonly favouring the occurrence of *post partum* hæmorrhage?

II. Having ascertained these, can we prevent their occurrence?

III. Admitting that the symptoms enumerated by Dr. Whittle are frequently indicative of the occurrence of *post partum* hæmorrhage, is the administration of ergot always sufficient to obviate the danger; it being borne in mind that I speak only of hæmorrhage occurring after the birth of the child.

Leaving out of consideration for the present those cases in which the placenta is morbidly adherent, the causes most commonly producing *post partum* hæmorrhage are, I think, these.

1. Exhaustion of the uterus.

2. Exhaustion of the nervous system of the mother.

3. The too rapid emptying of the uterus, whether as regards the fœtus or placenta.

4. The failing to give due support to, and the injudicious manipulation of, the uterus after the expulsion of the placenta.

These, in my opinion, are the most common causes favouring the occurrence of *post partum* hæmorrhage; to these other exceptional ones may be added, such as laceration of the cervix, a cause, I am satisfied, often overlooked; the existence of fibrous tumours embedded in the uterus, and a varicose condition of the cervix uteri. These, however, it is not my intention to discuss; they are foreign to the subject in the limited view which Dr. Whittle's paper embraces.

Foremost in the list, the most important, because the most common cause of hæmorrhage occurring after the birth of the child, is exhaustion of the uterus. The uterus is an involuntary muscle, called into action only for a special purpose, and capable of continuing its action but for a limited period. If it fail within a moderate time to expel its contents, it becomes exhausted; the pains, to use Dr. Whittle's words, "become short, quick, and cease suddenly", because the muscle, being exhausted, is unable any longer to culminate into that powerful tonic contraction, which is so distinctive a feature of a perfectly normal labour pain; the intervals too, as pointed out by Dr. Whittle, are prolonged, because the exhausted muscle is unable soon to contract again. Dr. Whittle's explanation of the cause of hæmorrhage in such cases is perfectly correct; "after the child is born, a relaxation follows;" after the placenta is expelled, "the uterus again relaxes, continuing the same tendency which existed before the delivery of the child."