THE VAGINAL PLUG IN ACCIDENTAL HÆMORRHAGE.

By E. HASTINGS TWEEDY, F.R.C.P.I.;

Gynæcologist to Dr. Steevens' Hospital;
Formerly Assistant-Master, Rotunda Hospital, &c.

[Read in the Section of Obstetrics, January 7, 1898.]

ACCIDENTAL hæmorrhage is one of the few complications in midwifery concerning which a marked disagreement as regards treatment exists. The term itself is now used in a very definite sense, and signifies an *ante-partum* bleeding occurring after the seventh month of gestation, from beneath the normally-implanted placenta. Before discussing this question, however, it is well to draw a distinction between those hæmorrhages associated with an atonic uterus and those not so associated.

In the absence of labour the diagnosis between these conditions may present some difficulty, but should labour be in progress the presence or absence of a contracting uterus will at once decide the point. If labour pains are strong and the os dilated the prognosis is decidedly good, and to rupture the membranes, or turn and bring down a foot, will, as a rule, suffice. Forceps may at times be indicated, and even accouchement force can, under the circumstances, be as a rule successfully accomplished. But in the presence of an atonic or inert uterus, with a long unretracted cervix and a partially opened os, how can we hope to improve matters by any of the above proceedings?

Rupture of the membranes, with or without podalic version, does not excite the uterus to contract for many hours. The hæmorrhage, therefore, is most likely to continue, and the operator, in spite of his better judgment, is

not infrequently compelled to employ forcible dilatation of the cervix and rapid delivery.

In doing this the cervix is liable to be torn, and large branches of the uterine artery to be laid open; but even should the latter accident be avoided, the performance of this forced delivery produces a condition of shock which proves but too frequently greater than the patient can bear. It is no exaggeration to say that the performance of Porro's operation even would, under the circumstances, be a less hazardous proceeding. In the vaginal plug, however, we have an alternative to the above line of treatment, capable, I believe, of obviating the worst dangers arising from accidental hæmorrhage.

It is curious to note that on few devices has greater obloquy been heaped than on this, and yet it seemed to Dr. Smyly, during the latter years of his Mastership in the Rotunda Hospital, to present fewer disadvantages than any other proceeding, and accordingly it became the "routine" treatment in that Institution. Dr. Smyly dealt with this subject in a paper read before the Obstetrical Section of the British Medical Association, at their annual meeting held in Bristol, and in it maintained that a properly applied tampon prevented external bleeding, excited labour pains, and induced rapid dilatation of the os—this latter taking place without any fear of laceration, or loss of its single layer of epithelium so necessary to it as a barrier against germ invasion. He also stated that in the event of concealed hæmorrhage still flowing, the intra-uterine tension would thereby be increased, and a greater and greater difficulty would thus arise against a systemic leak, and that this would be more readily brought about were a tight abdominal binder also applied. He did not advocate the plug save when the membranes were intact—a condition of course found in the majority of cases.

Few, I think, will be found to deny any of the claims so far made in favour of the vaginal plug, but its action is more far-reaching, I believe, than Dr. Smyly has contended, for it acts not alone in the manner he states, but also and above all as a tourniquet to the uterine arteries.

If the cervix is fixed, and at the same time forcible pressure exerted on the vault of the vagina in the region of the lateral fornices, the uterine arteries become acutely bent and their blood-flow impeded. This is probably brought about by the drag exerted on them through their cervical branches. On the pregnant cadaver I have had but one opportunity of verifying this statement, and here shortly after death I easily induced this bending by exerting firm pressure in the lateral fornices. Other proofs, however, are forthcoming in support of my contention. Hysterectomy by Doyen's method furnishes us with an example of the complete manner in which the uterine circulation can be controlled by a down drag exerted on the cervix; and finally, there is abundant clinical evidence to show that blood to any serious extent does not form above a properly-fitted tampon.

I am aware that this statement will not meet with universal assent, for as a matter of fact many cases of death have been recorded where this treatment was employed. But was the tampon properly applied in these cases? I think not.

In the discussion which followed the reading of Dr. Symly's paper, one gentleman of great eminence stated that he carried a boiled sponge in his bag for the purpose of plugging the vagina; another stated he preferred his silk pocket handkerchief. In other cases I have seen tenax, dry cotton wool, iodoform gauze, and a torn shirt used for the purposes of a tampon. With examples such as these before me I trust I shall not be considered pre-

sumptuous in assuming that the proper material to use, or the proper mode of its application, is not universally known.

To accomplish this little operation in a satisfactory manner many pieces of sterilised cotton wool are required, each the size of a small closed fist, and should be placed in a weak antiseptic solution. The patient is then brought out to the edge of the bed, put lying on her left side, and when the vulva and vagina have been asepticated and the bladder emptied, the pieces of cotton wool are taken one by one, squeezed of their superfluous fluid, compressed into a comparatively small compass, and inserted without the aid of a speculum in such a manner that the entire cervix is surrounded by pledgets before the os is covered. Each piece is packed as tightly as possible, and then the vagina is filled to its utmost capacity down to the urethra; a diaper placed between the thighs, and a tight abdominal binder complete the operation.

It is simply astonishing the amount of cotton wool that can be introduced in this manner, and how hard and incompressible such a plug becomes, and it is in favour of such a tampon only that I contend. Hæmorrhage ceases when it is thus inserted. The cervix safely and rapidly dilates, in a manner much to be preferred to that accomplished by hydrostatic bags. Labour pains, moreover, are induced quickly. This latter effect is probably in great part to be accounted for by the inevitable accumulation of carbonic dioxide gas, which must form in the uterine muscle in consequence of the obstruction to its vessels caused by the tampon.

The cervix, though becoming dilatable, does not always dilate, nor is it drawn up until the plugs have been removed, and so markedly was this a fact in one of my cases that, though the os when first felt while removing

the pledgets did not appear to have a greater diameter than a two shilling piece, it had nevertheless fully dilated before the end of the operation, a period of not more than two minutes having elapsed between the two observations. In fact it seemed to spring open when once the restraining pledgets were taken away. Nor is the tampon applicable to those cases alone in which the membranes are intact, for the circulation in the uterine vessels is still controlled even after their rupture.

I have not seen any cases in which hæmorrhage continued in spite of this treatment, though one woman unfortunately died shortly after I had inserted the plugs. Her history is briefly this:—The case occurring in the Out-patient Maternity Department of the Rotunda Hospital, she was at first attended by the night students on duty, who promptly summoned the Clinical Clerk, and when eventually I saw her she was in a condition of extreme collapse, with blood still freely flowing through an inefficient tampon. This was immediately removed, and a new one placed in position, then an intravenous injection of several pints of saline solution was administered. She died suddenly two hours later from shock, no hæmorrhage having either passed through or been extravasated above the tampon, and this in spite of the large quantity of saline solution injected. How could the hæmorrhage have ceased in this case were the circulation in the uterine vessels not directly interfered with?

The conclusions arrived at here are as follows:—

1. The vaginal tampon when properly applied is the most suitable treatment we possess for the worst forms of accidental hæmorrhage.
2. It may be relied on as sufficient in the majority of cases not amenable to other treatment.

3. It controls the circulation in the uterine arteries, acting in much the same manner as does a tourniquet.

4. It dilates the cervix partly by exercising a peripheral force on that structure, and in part by exciting uterine contractions.

5. These latter are induced not alone as a consequence of cervical dilatation, but are chiefly attributable to the power the tampon possesses of bringing about an accumulation of carbonic acid gas in the uterus.

DR. WINIFRED DICKSON said that accidental hæmorrhage had always seemed to her to be the very worst complication in midwifery. Why did he (Dr. Tweedy) think it better not to use the speculum? She thought that the plug ought to be sterilised. Did he plug with balls of cotton wool, and did he attach strings to them in order to facilitate their removal?

DR. MACAN thought that accidental hæmorrhage was amongst the most difficult of the accidents of parturition to treat. He could recall several cases where Dr. Tweedy's treatment might have been of service, if it was as serviceable as he (Dr. Tweedy) hoped it to be, but he (Dr. Macan) wanted proof of the statement that the uterine arteries are stopped by the process of plugging. As far as internal accidental hæmorrhage goes, before total detachment of the placenta, his method stopped the uterine arteries, and his treatment in these cases was most favourable. Plugging might be carried out as long as the membranes were perfect, but, after their rupture, there was no means of increasing the intra-uterine tension. So far, he (Dr. Macan) preferred to introduce a Barnes's bag in preference to plugging the vagina; also, in placenta prævia, where the bleeding surfaces were quite close, he preferred to use a Barnes's bag. He did not understand how Dr. Tweedy's method could twist the arteries very much, nor how the accumulation of carbonic dioxide could take place.

DR. ALFRED J. SMITH said that he did not understand how a vaginal plug would so act as to compress the uterine arteries. Dr. Tweedy wanted them, he thought, to believe that his method was different from the method adopted in hospitals. To his mind the great difficulty in dealing with such cases was not in cases where

labour had started at all, but in cases of concealed hæmorrhage, where the patient was collapsed and almost pulseless, with no labour pains, cervix quite hard, and where there was a pathological condition of the uterine muscular fibres. He thought that the best treatment in grave cases would be to ligature the uterine arteries direct, and the uterus could be then removed. Death from accidental hæmorrhage generally occurred after delivery, up to two hours after parturition.

DR. DOYLE considered that unless an artery was atheromatous very little pressure would stop it.

DR. R. D. PUREFOY said that the practice in the Rotunda Hospital in such cases was to plug, and that accumulating evidence was distinctly in favour of continuing the practice. He thought that such subsidiary means as the use of a firm binder should not be forgotten, and also the stimulation of the uterine contractions by the careful manipulations of both hands.

DR. KNOTT also spoke,

DR. TWEEDY, replying, said in answer to Dr. Dickson that he always used sterilised cotton wool. A much greater quantity of wool could be pressed into the vagina without a speculum. He did not employ strings, as by so doing he did not see how so tight a plug could be made with strings as without, and there was no difficulty in removing the pieces of cotton wool. Dr. Macan had said that he (Dr. Tweedy) had not adduced any evidence to show that the circulation was impeded. He (Dr. Tweedy) said that in one of the cases which he had been able to study he was easily able to bend the whole broad ligament by pressing in the lateral fornices and pulling down the cervix, and was able to tighten the lower portion of the broad ligament against the upper portion. A branch of the uterine artery ran to the cervix before the uterine artery entered the uterus, and if the cervix were pulled upon, and a plug placed outside the branch, the uterine artery must receive a sharp bend at the plug.