UTERO-VAGINAL TAMPONADE; ITS OBSTETRIC USES.

BY

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THE use of tampons inserted into the vagina for the control of hemorrhage is very old. They were mainly used to carry astringents, vinegar, etc., to the parts. Leroux, in 1776, introduced actual vaginal tamponade, and by some[1] it is claimed he first advised uterine tamponade. This he did not do, as his uterine tampons were used simply to carry astringents into the uterus.

The real inventor of the uterine tamponade, according to Dührssen,[2] the father of the procedure, is Wendelstaedt, who recommended it in 1806. In 1887 Dührssen[3] published the method

[1]Auvard. Travaux d'obstetrique, Tome II, Paris, 1889.

[2]Dührssen. Ueber die Behandlung der Blutungen Post-partum. Volkmann's Sammlung Klin. Vorträge No. 347.

[3]Dührssen. Centralblatt für Gyn., 1887, No. 35.

of tamponing the uterus with iodoform gauze, for post-partum hemorrhage. Previous to this various procedures had been practiced, *e.g.*, application of perchloride of iron to the uterus, Binet and Barnes; the insertion of bladders and rubber bags into the uterus, Rouget, Chassagny, *et al.*; through these the real value of the tamponade was hidden and lost. To Dührssen, then, belongs the credit for introducing and forcing on the medical profession the truth of the value of the utero-vaginal tamponade in post-partum hemorrhage.

There are other uses for the procedure, which we will take up in order.

POST-PARTUM HEMORRHAGE.

The frequency of severe hemorrhage post-partum is variously estimated. In Germany Dührssen finds about three hundred deaths from it each year. The writer has had no death from post-partum hemorrhage, but knows the details of two cases occurring in the city.

The causes of post-partum hemorrhage are divisible into three grand classes, atony of the uterus, lacerations in the parturient canal, and disordered blood. Atony may come from many causes—previous over-distention, too rapid delivery, retained pieces of placenta or adherent blood clots, a generally weakened woman, etc. Of the lacerations, cervix and lower uterine segment tears are the most formidable, though the writer has seen four cases of severe hemorrhage from clitoris tears. One was almost fatal. Abnormal conditions of the blood have been held forth as causative of post-partum hemorrhage, but only recently is proper recognition being given them. The writer, in a paper on a case of accidental hemorrhage,[4] reported three cases where a blood dyscrasia existed, causing severe, and, in one case, fatal hemorrhage. Ahlfeld[5] tells of a fatal post-partum bleeding, in spite of tamponade, where examination of the blood showed absence of fibrinogen and a deficiency of organic substances.

Of primary importance in the treatment of any case of post-partum hemorrhage is the recognition of the cause. Before the placenta is delivered one may be unable to determine whether the bleeding is due to laceration or abnormality in the mechanism of the third stage. In such cases of hemorrhage it is the writer's

[4] De Lee. American Journal Obstetrics, Vol. XLIV, No. 6.
[5] Ahlfeld. Zeitschrift für Geb. und. Gyn., Bd. XLVII, Hft. 2.

practice to carefully and quickly inspect the visible wounds, to massage the uterus vigorously, and if the bleeding does not cease immediately, to express the placenta. If the placenta does not come readily, or if the hemorrhage persists after its delivery, the sterile hand is passed into the genitals, the whole genital tract is quickly emptied and the surfaces palpated for injuries. The state of the uterus and the site and extent of laceration are quickly determined, and proper treatment at once instituted. A bleeding clitoris or low vaginal tear should be sutured. A high vaginal, cervical, or lower uterine tear may, under favorable circumstances, be sewed up. Such favorable conditions are moderate hemorrhage and surgical facilities. Where one can see the bleeding come from a laceration in the cervix it is usually possible to pass the needle through the angles of the wound. However, in most cases the blood wells up in such amounts that the field is flooded, and one feels the tear, but cannot see to sew it up. The recommendation of Henkel[6] to put vulsellum forceps at each side of the uterus, grasping the broad ligaments from the vaginal fornices, deserves a trial here.

Should it be impossible or appear impracticable to suture a cervix tear the best method of stopping the hemorrhage is by a firm utero-vaginal tamponade. Ergot and brisk uterine massage should be given in all cases of post-partum hemorrhage (the ergot after the placenta is born) because firm contraction of the uterus helps to limit the bleeding from the lower uterine segment and the cervix.

In cases of hemorrhage from atony the routine treatment of the writer is as follows: (1) Brisk uterine massage; (2) ergot; (3) a short but hot (125° to 130° F.) uterine douche; (4) bimanual compression of the uterus in anteflexion; (5) utero-vaginal tamponade.

There are other methods which the writer occasionally practices, *e.g.*, compression of the aorta, drawing down the cervix with vulsella, packing the vagina and bimanual compression of the uterus through the tampon, external massage over the balled fist in the uterus, electricity, etc. Which of these is to be used, or whether any time is to be wasted on the less certain of them, depends on the nature of the labor, the amount of blood lost before, during and after labor, and the facilities at hand for treating the case. If the patient has lost much blood so that a further even small loss appears dangerous, or, at most, undesirable, the

[6] Archiv für Gynecologie, 1902.

uterus is packed at once. Such cases are, *e.g.*, placenta previa, premature detachment of the placenta, small and anemic women, cases of shock, etc.

If the patient has been treated by the less definitive methods, douches, massage, aortic compression, bimanual compression, attempted suture of a tear, etc., and the hemorrhage has persisted, one should not waste too much time and blood, but pack the utero-vaginal tract tightly. In fresh, strong, full-blooded women the usual methods will usually lead to success and one has no need of the tampon.

The tamponade in the writer's hands has proven so simple and so safe that he uses it prophylactically in cases where the bleeding is not great. Then the patient is considered safe and may be left without apprehension on the doctor's part, which is not the case where the accoucheur has, after much pains, gotten a hemorrhage to cease without tamponade; there is always the fear that it may recommence.

After an operative delivery, where often the patient has been in labor for many hours and it is desirable to get her off the table and warm in bed as soon as possible, it is a very grateful procedure to remove the placenta quickly, and if a little oozing persists or the uterus shows a tendency to fill with clots, to tampon the whole tract. The patient may then be safely put to bed. No time is wasted and blood lost on slow and uncertain methods of procuring hemostasis.

Hemorrhage sometimes comes from the lower uterine segment, especially in cases of low placental insertion; again, from small lacerations here, that cannot be reached by suture. The tampon is indicated in these cases.

After Cesarean section it may be necessary to tampon the uterus because of atony. Dührssen recommends it, also Vicarelli.[8]

Where there exists a blood dyscrasia the case takes a decidedly serious aspect. If a woman is known to be a bleeder, during pregnancy calcium chloride and gelatin should be given; and for the labor special preparation should be made. It is usually not known that the patient has this tendency, and the appearance of the blood will not suggest it in all cases. In some cases the blood presents an altered appearance, being watery or lake-colored, or resembling

[8]Vicarelli. "Seven Cases of Uterine Tamponade after Cesarean Section." L'Anno scolastico, 1900, 1901, dell Instituto ostetrico e ginecologico della Univ. dé Toreno, 1901.

an emulsion of red brick dust. The clots are not firm, do not look like healthy cruor, and they may be small and almost black.

Where the appearance of the blood suggests some abnormality of its constituents and where one tamponade has proven inefficient the utero-vaginal tract should be repacked with gauze saturated with a 10-per-cent. solution of gelatin. In two instances of my own. this procedure stopped at once obstinate hemorrhage. The greatest care must be exercised to obtain sterile gelatin solution. In the two cases referred to the gelatin was boiled over a very hot fire for thirty minutes with constant stirring to prevent burning. Gradewitz[9] reports a case and refers to seven others of fatal tetanus infection from subcutaneous injections of gelatin solution. The writer has had no experience with adrenalin in the treatment of puerperal hemorrhages.

THE TECHNIQUE OF THE OPERATION.

It is best to pack the whole utero-vaginal tract and to use one piece of gauze. This facilitates removal. The writer prepares the gauze as follows: Ordinary so-called sterile gauze, sold by surgical supply houses is used, is cut into strips thirteen yards long and one-half yard wide; it is folded and the selvedge and raw edge turned in, then thoroughly washed in running water, after which it is boiled twenty minutes in .5-per-cent lysol solution. It is then allowed to soak several hours in this solution, when it is wrung out dry through a scalded clothes wringer. Using rubber gloves, each strip is packed into a sterile jar, filling it evenly and smoothly from the bottom to the top, on which a layer of cotton is placed and the jar is closed. The jar is put in the steam sterilizer and boiled every day for three days, two hours each time. After the last boiling, while still warm, the head of the jar is dipped into melted paraffine to seal it. Thus prepared, the gauze will keep for years and is absolutely safe. When time to use it, the wrapper is removed, the cap taken off, the jar covered with a sterile towel, and the gauze introduced directly from the jar which is held near the vulva. The half hand is placed in the vagina with the finger-tips in the cervix, and by means of a long curved packing forceps the end of the gauze is carried to the top of the uterine cavity, then the whole cavity is packed, making sure to fill out the sides. When the uterus is half full the gauze is stuffed in by the fingers, using the other hand on the fundus through the abdomen as counter-

[9]Gradewitz. Cent. für Gyn., No. 3, 1902, p. 967.

pressure. For aseptic reasons the belly is covered with a sterile towel. The packing is then continued. After the uterus is full the vagina is tamponed tightly also. In some few cases more than thirteen yards could be packed in, while others need only five or six yards. This depends on the uterine contraction and the size of the parts. That the strictest surgical asepsis should be practiced is absolutely necessary for success.

Other antiseptics than lysol have been recommended, but the writer has seen no good reason to change. Non-absorbing gauze has also been tried, instead of the absorbent, one operator having had the gauze impregnated with gutta-percha. It is doubtful if clotting will take place as readily in such gauze as in that here recommended.

A modification of the tampon was employed by the writer in two cases. Since bleeding continued from the uterus after its cavity was filled with gauze, not relying on the vaginal tampon to stop it, the gauze was cut off after the cervix was filled and the anterior and posterior lips of the latter drawn together and united by suture, closing the uterus entirely. The effect of this procedure was excellent in both cases.

The gauze is removed in sixteen to thirty-six hours. In cases of atony the gauze may be removed all at one sitting, and soon. In cases of tamponade for laceration it is advisable to remove a few yards at a time, the last at the end of forty-eight hours. In all cases fresh gauze and instruments should be at hand to repack if the hemorrhage starts up again. In only one case has the writer found this necessary—a case of deep, lower uterine segment tear. (Recovery.) The gauze should be removed very slowly, taking twenty to thirty minutes of gradual traction, relaxing the tension every few minutes to allow the uterus to follow down the gauze. As a rule, the uterus contracts down hard when thus emptied.

THE ACTION OF THE GAUZE.

The reasons of the success of the gauze in stopping the hemorrhage are:

1. The rough packing stimulates the uterus to contract. One can feel the uterus contract as its cavity is filled by the gauze.

2. The gauze tampons directly the site of the hemorrhage, and the pressure mechanically stops the flow of the blood.

3. The gauze acts like a Miculicz, and favors the clotting of the blood in the meshes, and in the subjacent mucous membrane.

4. The gauze fills up the empty uterus. It is a clinical fact that in some cases the uterus will not close down on itself sufficiently to obliterate its cavity and stop the hemorrhage. A blood clot does not stop hemorrhage well, but gauze does.

5. The gauze lifts up and supports the uterus, relieving it of the congestion it undergoes when sagging in the pelvis. The re-establishment of an easy circulation does much to stop the hemorrhage.

THE OBJECTIONS TO THE PROCEDURE.

Any departure from the previous order of things evokes adverse criticism, and the tamponade, when exploited by Dührssen, was no exception. Many voices were raised against it, and the way was not smooth for it. Here and there, however, the method was employed, and now with a few exceptions the procedure has obtained recognition abroad, and, perhaps to a less extent, in this country. The objections urged, usually by men who had not tamponed, or had tamponed poorly, or who argued entirely from theoretical standpoints, were as follows:

a. The method is unphysiological; that all our efforts should be directed to empty the uterus, to get it to contract down on itself; that only by obtaining contraction could hemorrhage be stopped; and that the gauze by filling the uterus prevented this contraction, thus directly increasing the flow. To which may be replied: (1) A uterus can contract sufficiently to stop hemorrhage when it is only partially emptied—evidence, those cases where the placenta is still in the uterus, detached, and there is no bleeding; (2) the uterus contracts when there is a larger mass in it, namely, the child. Further, we find many women that are tamponed suffer from after pains. (3) All uteri *will not* contract down sufficiently to bring the walls in apposition; a space is left and this fills up with clot which stops further hemorrhage. If we squeeze out the clot, as recommended in so many text-books, hemorrhage sometimes recommences and ceases only when another clot is formed. This process may be repeated until the patient is exsanguinated, so in these cases the advice should be *to leave the clot; it is nature's tampon of a vacant cavity.* (4) The writer has had several cases where there was no determinable laceration, and the women bled dangerously in spite of a firmly contracted uterus. Contraction of the uterus, therefore, is not everything. (5) Finally, clinical experience in a large number of

cases shows that the tamponed uterus contracts, and firmly too, and that it does not allow clots to form on top of the gauze.

b. A second objection urged against the tampon is the danger of sepsis. It seems superfluous in this day to try to refute this argument. The uterine tampon is no more dangerous than the Miculicz abdominal tampon, and a man who cannot apply one aseptically is not safe to be entrusted with other obstetric operations. It is possible that germs in the vagina may be carried up into the uterus. The danger from this is minimal, because the germs in the vagina are of low virulence, the canal is usually pretty well cleaned out at this stage of labor, an antiseptic vaginal douche has almost always preceded the tamponade, and finally, the lysol gauze is slightly antiseptic itself. In the fifty cases in which the writer tamponed the uterus only four had fever, and one had 103° F. at the time of operation. The others were infected by many other conditions. Only one case was really ill, and she recovered. In fact, the writer sometimes tampons to prevent sepsis, believing that the weak lysol gauze has some antiseptic effect.

c. It has been said the cervix could be torn by the vulsella used to pull the uterus down, and that the gauze could be pushed through the uterus. A little practice will enable one to dispense with vulsella, and one could, if it were desirable, do without the packing forceps. Ordinary care will prevent accidents, and the writer has designed a forceps for packing which makes such uterine injury well nigh impossible.

d. The danger of air embolism has been raised as an objection. Only one case has been reported (Dührssen, *l.c.*), and this is doubtful. This possibility is very remote, is not as great as with many other obstetric procedures, and can be avoided by raising the shoulders a little above the level of the uterus. The objection is only polemic.

e. Finally, the tampon has been called inefficient, and it has been claimed that operators use it when not necessary, and, therefore, obtain good results.

That the tampon is efficient the fifty cases reported herewith prove beyond all doubt. Fifty cases, and in all but one the bleeding was stopped. In three cases it was necessary to remove one tampon and insert another. One of these, a uterine tear, was inefficiently packed by an excited operator, who was unprepared for the emergency; in two others, the patients were bleeders. In the first the hemorrhage ceased gradually; in the second it stopped definitely when the parturient canal was packed with

gelatin gauze. The patient in whose case the tampon did not stop the bleeding was a hemophilic, with detachment of the placenta. The patient bled from the hypodermic punctures, a hematoma developing around each, there was a bloody infiltration extending through the vulva, the vagina, and, presumably, the uterus and sub-peritoneal spaces, without visible injuries, and the patient was dying before the tampon was applied. In all the rest the hemorrhage ceased at once, and permanently.

The writer is willing to admit that many women are tamponed when one could get along without the procedure; in fact, not a few of his own cases fall in this category. What one considers "necessary" to do, in cases of post-partum hemorrhage, depends on the standard of obstetric practice one sets. To barely save the woman alive, and to save most of the babies, is not our present obstetric standard. We must save all the women and babes that are healthy, and leave them well and secure from immediate or future, temporary or permanent invalidism.

Cases are known to the writer where the effects of a hemorrhage were felt for months and years. The puerperium is longer after a severe hemorrhage, lactation is often disturbed, the women recover slowly and are more exposed to septic complications, thromboses and emboli are invited (Barnes' Obstetrics, p. 607), also blindness, (Hughlings, Jackson, *ibidem*), and hemiplegia and aphasia. Pernicious anemia may originate in a severe hemorrhage (Dock). After a severe hemorrhage one is inclined to neglect the repair of lacerations, or do the work hastily and poorly.

The loss of over a pint of blood at a labor should be prevented. This loss compensates the gain of the fluid during pregnancy, and is not felt by the woman. Although a woman may lose a quart of blood, or even three pints, and not be seriously anemic, such hemorrhages should be prevented because unnecessary and dangerous. One can never be certain of the way an individual reacts to the loss of blood, some being deeply affected by a small bleeding and others standing a profuse flooding with few signs of anemia. Most patients bear up well under hemorrhage to a certain point, passing which, the condition becomes one of acute jeopardy. In a small anemic woman a small loss of blood is serious. One-thirteenth the body weight being blood, a woman weighing one hundred pounds has only eight pints. A patient may recover after losing one-third the total quantity, and dies if one-half is lost. The limits of a hemorrhage, therefore, are apparent. Then, too, hemorrhage must be taken well in hand early,

because one does not know how successful, or how quickly successful the various hemostatic measures may be.

Considering all these facts, it is the course of wisdom to consider every hemorrhage over a pint as serious, to step in early to combat such loss and to not waste time on inefficient or slow methods of procuring hemostasis.

The following obstetric authorities recommend the use of the utero-vaginal tampon in post-partum hemorrhage, but are by no means all: Dührssen, Küstner, Leopold, Auvard, Fraipont, Dohrn, Walcher, Benckiser, Fritsch, Zweifel, Schaeffer, Schauta, Spiegelberg (Wiener).

Among American authors, Jewett, Davis, Parvin, Grandin, Jarman, J. C. Webster, Hirst, Reynolds.

For cervix tears, Olshausen, Veit, Kleinwächter, Ahlfeld.

USE OF THE TAMPONADE IN PLACENTA PREVIA.

The writer finds little use for this measure. In cases of hemorrhage from placenta previa, if the patient is where she can be definitively treated, the tampon has no place. If it is necessary to transport the patient, or if one is waiting for help or instruments, the vagina should be tightly tamponed to prevent an unnecessary loss of blood.

The tamponade to induce labor is one of the milder measures toward this end. It may very advantageously be combined with the use of soft rubber bougies. After the bougie is inserted the writer packs the cervix with weak iodoform gauze, and then, also, the vagina. Pains are more rapidly brought on than by the simple use of the bougies. The cervico-vaginal tamponade alone, for the induction, has been used by several operators and with fair success, though Keitler and Pernitza[10] give a contrary opinion.

II.

The Use of the Tamponade in Abortions.—The vaginal tampon is a standard and useful treatment of certain conditions occurring in abortion, but the writer wishes to recommend a procedure that is not generally practiced, for the treatment of incomplete abortions, and for the induction of abortion for therapeutic purposes.

When part of the ovum is expelled and it is impossible or undesirable to forcibly dilate the uterus and remove the remainder,

[10]Keitler and Pernitza. Berichte aus der II. Geburts. Klinik, Wien, 1902.

a safe course is to pack the uterine cavity with a thin strip of gauze, then tampon the vagina tightly with sterile cotton, and leave the case till next day. The cervix will then be found soft and easily dilatable, if not fully dilated, and the gauze with uterine contents, expelled on top of the cotton tampon.

In inducing therapeutic abortion the sac may be punctured, the amniotic cavity packed with gauze, and then the vagina, as above described. This may be done without anesthesia, and on the next day the cervix will be found softened, or even fully opened, so that the removal of the uterine contents is an easy matter. Abortion performed thus, in two sittings, is much less likely to leave injuries in the cervix, and where haste is not necessary the method is to be preferred.

The utero-vaginal tamponade as a means of carrying medication to the parturient tract is employed by some accoucheurs. The writer believes this field of usefulness is very restricted; indeed, that the procedure is capable of much harm.

After cleaning the uterus in cases of puerperal sepsis and septic abortion the utero-vaginal tract is lightly filled with a 4-per-cent. iodoform gauze in one strip. The main object of this is to prevent the formation of blood clots in the uterus, and to remove, when the gauze is withdrawn, in four or five hours, such as do form. The parturient canal is then left severely alone, unless symptoms point to the formation of abscess, when the case is treated on surgical principles.

The writer believes that constant manipulation of an infected uterus, as by douches, curettage, medicinal applications, packing, etc., only aggravates the affection and carries the poison further, while at the same time the actual local benefit derived is lost in the spread of the disease to inaccessible regions.

This paper does not comprehend the use of the simple vaginal tampon; and it does not intend to mean that there are not other occasional cases where the utero-vaginal tamponade may be employed.

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