Abdominal intrauterine vacuum aspiration

W.A.A. Tjalma

Multidisciplinary Breast and Gynecologic Oncology Clinic, Antwerp University Hospital, University of Antwerp, Antwerp (Belgium)

Summary

Evaluating and "cleaning" of the uterine cavity is probably the most performed operation in women. It is done for several reasons: abortion, evaluation of irregular bleeding in premenopausal period, and postmenopausal bleeding. Abortion is undoubtedly the number one procedure with more than 44 million pregnancies terminated every year. This procedure should not be underestimated and a careful preoperative evaluation is needed. Ideally a sensitive pregnancy test should be done together with an ultrasound in order to confirm a uterine pregnancy, excluding extra-uterine pregnancy, and to detect genital and/or uterine malformations. Three out of four abortions are performed by surgical methods. Surgical methods include a sharp, blunt, and suction curettage. Suction curettage or vacuum aspiration is the preferred method. Despite the fact that it is a relative safe procedure with major complications in less than one percent of cases, it is still responsible for 13% of all maternal deaths. All the figures have not declined in the last decade. Trauma, perforation, and bleeding are a danger triage. When there is a perforation, a laparoscopy should be performed immediately, in order to detect intra-abdominal lacerations and bleeding. The bleeding should be stopped as soon as possible in order to not destabilize the patient. When there is a perforation in the uterus, this "entrance" can be used to perform the curettage. This is particularly useful if there is trauma of the isthmus and uterine wall, and it is difficult to identify the uterine canal. A curettage is a frequent performed procedure, which should not be underestimated. If there is a perforation in the uterus, then this opening can safely be used for vacuum aspiration.

Key-words: Vacuum aspiration; D&C; Dilatation; Suction; Curettage; Abortion; Complication; Bleeding; Hemorrhage; Medical abortion; Failed attempted abortion.

Introduction

Almost 44 million pregnancies ended in an induced abortion in 2008 worldwide [1]. The performance of an abortion is probably one of the most frequent surgical procedures in women. First trimester abortions can be accomplished by medical and surgical methods. Despite the fact that medical abortion with mifepristone is simple and safe, still 75 % of the abortions are performed by surgical methods [2]. Surgical methods include a sharp - or blunt curettage or a vacuum aspiration (suction curettage). The latter is the preferred method. Surgical abortion appears to be an extremely save procedure with major complications in one to three percent of cases [3-5]. In "illegal" abortion the figures are, as to be expected, higher. According to the WHO, each year 21.6 million women experience an unsafe abortion worldwide [6]. Each year 47,000 women die from complications of unsafe abortion. Deaths due to unsafe abortion remain close to 13% of all maternal deaths. Worldwide, 49% of abortions were unsafe in 2008, compared to 44% in 1995. About one in five pregnancies ended in abortion in 2008 [1]. Abortion is a major health issue and the figures have not changed much in the last decade. The present report would like to emphasize this by describing the performance of an abdominal suction curettage in case of a patient with perforations and severe haemorrhage. The goal of present article is to point out that a perforation can safely be used for vacuum aspiration.

Revised manuscript accepted for publication June 24, 2013

Case Report

It presents a 24-year-old woman who initially had an abortion at eight weeks of amenorrhea. A vacuum aspiration was performed, however no fetal of placental tissue was seen in during histological examination. Subsequently an extra-uterine pregnancy was suspected. A repeated vaginal ultrasound revealed remnants of an intrauterine pregnancy and no signs of an extra-uterine pregnancy. A second attempt was performed for a vacuum aspiration. During this procedure no clear tissue could be retrieved. In order to clarify this situation, an ultrasound was performed. Under ultrasound guidance a curettage was done and this showed that the aspirator was within the abdominal wall, causing disruption and that there was a perforation at the back wall of the uterus. Furthermore the heart rate of the patient was increasing and there was a drop in blood pressure. An immediate laparoscopy was performed, showing massive blood loss and severe bleeding from the perforation. The uterus had a bicornual aspect. One cornus contained the pregnancy and the perforation and the other cornus had a "normal" non-pregnant size.

Due to the instable situation, laparoscopy was immediately converted to a laparotomy and a request was done for a gynaecologic consultant. During laparotomy 1,200 cc blood was removed and applying pressure on the perforation with one finger stopped the bleeding. Suturing the perforation permanently resolved the bleeding. A third attempt was done to perform a vacuum aspiration curettage under abdominal guidance. This confirmed the previous finding of a disrupted myometrial wall of the uterus. The pregnant uterus was typically weak and the false routes were so severe that there was no clear entrance in the cavum uteri. Instead of performing the classical hysterotomy, a suction curettage was done using the previously closed perforation after visual inspection of the uterus. The perforation was closed at the end of the vacuum aspiration. The patient had an unremarkable recovery and was discharged three days later.

Discussion

Despite the fact that vacuum aspiration is a save procedure, severe complications do occur. The rare complications are pelvis infection, excessive bleeding, cervical injury, incomplete evacuation, uterine perforation, uterine wall damage, endometritis, uterine synechia, tubal damage, anaesthesia complications, and ongoing pregnancy [7]. Major complications are less than one percent and the overall death rate for women obtaining legally induced abortions is 0.7 per 100,000 [8]. Hemorrhage and sepsis are each responsible for approximately one-fourth of the abortion related deaths. Embolism, complications of anaesthesia, and other causes account each for approximately 15 % of deaths [8]. Vacuum aspiration has the lowest surgical complication rates. During first and second trimesters the main complications are perforations (0.3% - 0.4%), cervical trauma (0% - 1.0%), bleeding (0% - 2.4 %) and infection (0.6% - 2.5%) [9-11]. The percentages of major complications rise from about two per 1,000 procedures for abortions performed at seven to eight weeks to six per 1,000 at 13–14 weeks and 15 per 1,000 after 20 weeks [12]. A recent randomised trial regarding complications by vacuum aspiration after cervical preparation, with and without misoprostol, showed that preparation of the cervix with 400 µg misoprostol vaginally reduced the incidence of complications [13]. Misoprostol preparation increased the diameter of the cervical canal, thereby reducing the need for mechanical dilatation in 40%. Subsequently this was translated in a reduced risk of cervical laceration, due to the fact that less force was exerted on the cervix. Furthermore the preparation allowed the use of larger suction tubes. Use of a larger suction tube facilitates evacuation of the uterine cavity, and the larger diameter of the cervix after misoprostol treatment also eases emptying of the cavity of any retained tissue by uterine contractions [13]. The main side-effects of misoprostol preparation were increased abdominal pain (55 % vs. 22 % in the placebo group) and vaginal bleeding (37 % vs. 17 %) [13].

In order to perform a safe surgical abortion, it is important to have a preoperative ultrasound, which shows that there is a uterine pregnancy, excludes extra-uterine pregnancy, and detects genital and/or uterine malformations. A sensitive pregnancy test at the beginning is recommended in order to confirm the pregnancy and to have the possibility of hCG monitoring if needed. One could consider performing a hysteroscopy, however this is time-consuming, may cause bleeding, and the additional benefits are low. An immediate gross and meticulous examination of the aspirate should be performed in order to discover failed attempted abortion or incomplete abortion [14]. In case of a questionable specimen, a strict follow-up should be followed in order to detect continuing pregnancy or an ectopic pregnancy. Routine microscopic examination of the tissue aspirates has only minimal diagnostic value. Only in doubt cases, for instance, of repetitive non-medical abortions or if there is the suspicion of a gestational trophoblastic disease, is there an indication for pathological examination.

The complication rates are reduced when the experience of the team is increased. This is particular true for uterine trauma. Nevertheless even in the most experienced hands, uterine perforations do occur. Vacuum aspiration is preferred above sharp or blunt curettage. Not only is it easier to handle, but there is also a reduced blood loss and lesser retained tissue. With sharp or blunt curettage, there is an increased risk of cervical injury and uterine trauma. Despite the fact there is increased endometrial abrasion, there are no data regarding the long-term morbidity, as the risk of developing intracavitary adhesions, cervical stenosis or subfertility [14].

The incidence of uterine perforation and/or trauma is estimated to be 1.2 per 100 vacuum aspirations. The two major dangers are haemorrhage and damage to the abdominal contents. Especially lacerations of the lateral walls of the uterus are dangerous due to the uterine vessels in these locations. Perforation of the fundus is in generally not dangerous. Blood vessels originate from lateral to medial and anastomose which each other. Most perforations therefore do not require any treatment. However a suction tube of the vacuum aspirator or a forceps in the abdominal cavity can cause severe lesions to the bowel, bladder or tubes. Due to the suction or traction, vessels of the organs can be lacerated, leading to severe haemorrhage. In case of a suspicion of perforation, the suction procedure should be stopped and a laparoscopy should be performed in order to access the damage of the uterus and other intra-abdominal organs. Laceration of an organ will not lead to an immediate problem, rupture of vessels on the other hand can lead to an extensive bleeding in a relative short time. Immediate action in these circumstances is required. During laparoscopic exploration, there is often an under-estimation of the bleeding due to the performed suction. It is important to identify the bleeding source as soon as possible and to stop the bleeding immediately by the simplest method. Sometimes several attempts occur arrest the bleeding by coagulation with a small forceps without any success. Due to the continuous suction, the surgeon it often not aware of the amount of blood the patient is loosing. The remark of the anaesthesiologist that the patient is instable is the late wake up call. If the bleeding cannot be directly arrested, pressure should be applied on the bleeding vessels in order to stabilise the patient and to organise you operating theatre. Once every one is in place and the correct surgical armamentarium is acquired, the bleeding problem can be easily solved. Attempting to arrest the bleeding with inadequate material is dangerous, and the patient is placed under unnecessary risks. Keeping focussed on the bleeding and applying pressure, suturing the laceration with only a few stitches resolves this complication in the shortest possible time.

In case of uterine wall trauma and false routes, the perforation can be used to remove the content of the uterine cavity. It should be possible to perform a vacuum aspiration

abdominally by laparoscopy, however, in the current case, this was not performed due to the severe intra-abdominal bleeding and the fact that the laparotomy had already begun. The fact that the patient had a uterus bicornus is probably the cause of the related morbidity in this case. Unfortunately the bicornual uterus was not noted in the preoperative evaluation of the patient. This was the base of the unsuccessful evacuation of the first abortion. Microscopic examination of the aspirated tissue should only "normal" endometrium and no signs of pregnancy. During the second attempt aspiration four weeks later, it was still not known that it was a bicornus uterus, but the vacuum aspirator was accidentally in the right cornus. Unfortunately due to the small cornus, multiple manipulations with force were performed leading to uterine wall trauma and perforation.

Despite the fact that abortion is one of the most frequent procedures performed in pregnant women, it can very dangerous. A meticulous pre-aspiration ultrasound evaluation is essential in reducing morbidity. In case of a perforation, evacuation of the intrauterine content by the abdominal route should be considered. Preferably the latter should be performed by laparoscopy if the patient is stable enough. Otherwise this should be performed by laparotomy, firstly stabilising the patient and secondly, evacuating the pregnancy products via the perforation hole.

References

[1] Sedgh G., Singh S., Shah I.H., Ahman E., Henshaw S.K., Bankole A.: "Induced abortion: incidence and trends worldwide from 1995 to 2008". *Lancet*, 2012, *379*, 625.

[2] Jones R.K., Kooistra K.: "Abortion incidence and access to services in the United States, 2008". *Perspect. Sex. Reprod. Health*, 2011, *43*, 41.

[3] Ngo T.D., Park M.H., Free C.: "Safety and effectiveness of termination services performed by doctors versus midlevel providers: a systematic review and analysis". *Int. J.Womens Health*, 2013, *5*, 9.

[4] Weitz T.A., Taylor D., Desai S., Upadhyay U.D., Waldman J., Battistelli M.F., *et al.*: "Safety of aspiration abortion performed by nurse practitioners, certified nurse midwives, and physician assistants under a California legal waiver". *Am. J. Public Health,* 2013, *103*, 454.

[5] Kerns J., Steinauer J.: "Management of postabortion hemorrhage: release date November 2012 SFP Guideline #20131". *Contraception*, 2013, *87*, 331.

[6] http://www.who.int/reproductivehealth/topics/unsafe_abortion/en/

[7] Grimes D.A., Cates W. Jr.: "Complications from legally-induced abortion: a review". *Obstet. Gynecol. Surv.*, 1979, *34*, 177.

[8] Bartlett L.A., Berg C.J., Shulman H.B., Zane S.B., Green C.A., Whitehead S., Atrash H.K.: "Risk factors for legal induced abortion-related mortality in the United States". *Obstet. Gynecol.*, 2004, *103*, 729.

[9] Diedrich J., Steinauer J.: "Complications of surgical abortion". Clin. *Obstet. Gynecol.*, 2009, *52*, 205.

[10] Lee V.C., Ng E.H., Ho P.C.: "Issues in second trimester induced abortion (medical/surgical methods)". *Best Pract. Res. Clin. Obstet. Gynaecol.*, 2010, *24*, 517.

[11] Hamoda H., Templeton A.: "Medical and surgical options for induced abortion in first trimester". *Best Pract. Res. Clin. Obstet. Gynaecol.*, 2010, *24*, 503.

[12] Boonstra H., Gold R.B., Richards C.L., Finer L.B.: "Abortion in women's lives". New York, Guttmacher Institute, 2006.

[13] Meirik O., My Huong N.T., Piaggio G., Bergel E., von Hertzen H., WHO Research Group on Postovulatory Methods of Fertility Regulation.: "Complications of first-trimester abortion by vacuum aspiration after cervical preparation with and without misoprostol: a multicentre randomised trial". *Lancet*, 2012, *379*, 1817.

[14] Lichtenberg E.S., Paul M.: "Surgical abortion prior to 7 weeks of gestation": *Contraception*, 2013, *88*, 7. doi: 10.1016/j.contraception.2013.02.008. Epub 2013 Feb 26.

Address reprint requests to:
W.A.A. TJALMA, M.D., PhD
University Multidisciplinary Breast Clinic Antwerpen
Multidisciplinary Gynaecologic Oncology Clinic
University Hospital Antwerp and University of Antwerp,
Wilrijkstraat 10, 2650 Edegem (Belgium)
e-mail: wiebren.tjalma@uza.be