



*A Quick Reference Guide
for Clinicians®*

Manual Vacuum Aspiration

June 2008

Contents

Using this Guide	1
Vacuum Uterine Aspiration in the United States	2
Indications for MVA Use	4
Clinical Components of MVA Procedure	10

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*This publication has been made possible by educational grants from
Ipas and UCSF Center for Reproductive Health Research & Policy.*

Using This Guide

This *Quick Reference Guide for Clinicians* presents a summary of clinical information about manual vacuum aspiration (MVA), an easy-to-use option for management of early pregnancy loss, elective termination of early pregnancy, and completion of failed medical abortion. A safe, effective option, MVA can reduce the amount of cost and time required and can easily be performed in an outpatient setting.

The Association of Reproductive Health Professionals (ARHP) hopes this brief review of the use of MVA will facilitate understanding and application of this important, under-utilized, safe, cost-reducing technology.

Vacuum Uterine Aspiration in the United States

Vacuum uterine aspiration allows for the simple evacuation of the uterus through a cannula attached to either an electric or manual vacuum source. Both methods of evacuation are safe and can easily be performed in any setting, including an office, emergency room, or the operating room. When conducted in the outpatient setting rather than operating room, vacuum uterine aspiration can result in substantial cost savings^{1,2} and significantly reduce patient waiting periods for services.³

The standard technique for vacuum uterine aspiration requires only the stabilization of the cervix with a tenaculum, application of local anesthesia, and insertion of a plastic cannula into the uterus (if the cervix is inadequately dilated, dilation may be needed). The cannula is then attached to a vacuum source (manual or electric) and the contents of the uterus are aspirated. In manual vacuum aspiration (MVA), the uterine contents are aspirated by manually generating negative air pressure (vacuum) into a large syringe. During electric vacuum aspiration (EVA), the cannula is attached to tubing, which is connected to the electric aspirator and the contents of the uterus are evacuated through the tubing into a container.

Overall effectiveness, patient satisfaction, and complication rates are comparable for EVA and MVA.⁴ MVA is highly portable, virtually silent, reusable, and available at a low cost. In patients who are less than 50 days of gestation, MVA results in less patient perception of pain as compared to EVA, but takes longer to complete.⁴

Additionally, pregnancy tissue may be easier to identify after MVA than EVA.⁵⁻⁷ Clinicians also report high satisfaction in the use of MVA.⁸

MVA Advantages

- Safe and effective
- Portable
- Low cost
- Easy to use
- Reusable
- Quiet
- Appropriate for many different clinical settings
- High patient and provider satisfaction
- Products of conception easily visible

MVA also can be used for any indication that requires suction evacuation of the uterus, including:^{5,9,10}

- Early pregnancy loss
- Elective termination of early pregnancy
- Completion of failed medical abortion

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Indications for MVA Use

Use of MVA in Early Pregnancy Loss

Early pregnancy loss is a common experience for women. Approximately one in four women will experience a miscarriage in her lifetime.¹ For women undergoing early pregnancy loss, vacuum aspiration is one treatment option. MVA has been reported to be safe and effective for this indication.¹⁻³

Use of MVA for Elective Termination of Early Pregnancy

The efficacy of MVA is comparable to that of EVA, with completion rates in most studies of 98% or greater.⁴ With highly sensitive urine pregnancy tests that can detect pregnancy even before a missed period, early abortions are possible. Because women can make a decision about their pregnancy as early as three or four days after a missed period, providing safe and effective options early in pregnancy increases the opportunities for women to access desired care.

Use of MVA for Completion of Failed Medical Abortion

Although the success rate of medical abortion using modern regimens of mifepristone and misoprostol typically exceeds 95%, aspiration is sometimes necessary for management of a continuing pregnancy, a persistent gestational sac, or heavy or prolonged bleeding. MVA offers an alternative to either D&C or EVA to manage this situation.^{2,3,5}

MVA Safety and Efficacy

Studies over the past 30 years have documented the safety and efficacy of MVA for early elective abortion and management of early pregnancy loss.

Contraindications and Cautions in Use of MVA

There are no contraindications for aspiration of the uterus using MVA up to 12 weeks gestation. Use of MVA for pregnancies between eight and 12 weeks gestation may require emptying of the syringe barrel one or more times to complete the procedure. Alternatively, multiple syringes may be used in succession.

Like EVA, MVA should not be used for endometrial biopsy in the case of suspected pregnancy¹¹ and should be used with caution in women who have:

- Uterine anomalies
- Coagulation problems
- Active pelvic infection
- Extreme anxiety
- Any condition causing the patient to be medically unstable

Life-threatening conditions must be addressed and managed before uterine aspiration, regardless of the vacuum source.

Possible MVA Complications

Any instrumentation of the uterus can result in complications.^{11,12} MVA use is associated with an overall complication rate of about 2%, the majority of which are required reaspiration and perforation.⁸

It is important to be able to diagnose and manage possible complications of MVA. These complications are similar for procedures performed with EVA or are a function of the indication for the procedure itself:

- **Incomplete evacuation:** Although using a cannula that is too small or stopping the aspiration too soon can result in retained tissue, subsequent hemorrhage, and infection, the majority of such complications occur when the procedure is performed appropriately. Careful observation for signs of procedure completion and meticulous tissue examination are the best ways to minimize the likelihood of incomplete evacuation. Risk factors for retained products of conception include greater patient age, body mass index, and pregnancy gestational age.¹³ Incomplete evacuation can be treated by repeating the uterine aspiration.
- **Uterine perforation:** This complication is most likely to occur during dilation. Careful examination to determine the position of the uterus and cervix is essential to minimize the risk of this complication.

Table 1: Summary of Results from Six Comparative Studies of MVA versus EVA^{4,6-10}

Data from a major retrospective study of 1,677 MVA procedures for elective abortion (99% < 10 weeks' gestational age) show:⁶

- 99.5% effectiveness*
- Minimal complications
 - 8 repeat aspirations (0.5%)
 - 12 infections (0.7%)
 - 1 uterine perforation (0.06%)

Data from a randomized study comparing MVA with EVA for elective abortion (91 MVA vs. 88 EVA procedures < 56 days gestational age) show:⁴

- 98% effectiveness**
- Minimal complications
 - 2 repeat aspirations (2.0%)
 - 2 infections (2.0%)
- No differences for MVA vs. EVA

Data from a randomized trial comparing MVA with EVA for first trimester elective abortion (41 MVA vs. 42 EVA procedures < 10 weeks' gestational age) show:⁷

- No statistically significant differences between groups in procedure time, estimated blood loss, complications, amount of analgesia used, or recovery time
- The two methods (MVA and EVA) equally acceptable to patients

* Overall, MVA was 99.5% effective in terminating pregnancy through 12 weeks of gestation. There were no major products of conception and infection were easily treated.

** MVA is effective in emptying the uterine cavity, on par with the standard vacuum aspiration. The rate of complications

*** Although blood loss was statistically lower with MVA, the difference between an estimated blood loss of 35 and 42

Data from a retrospective cohort analysis comparing MVA and EVA for first trimester abortion (1002 MVA vs. 724 EVA < 10 weeks' gestational age) show:⁸

- Procedure times similar for MVA and EVA
- Blood loss statistically lower with MVA***
- 22 reaspirations in MVA (2.2 %)
- 12 reaspirations in EVA (1.7%)
- Overall, no difference in rate of uterine reaspiration with MVA or EVA

Data from prospective study of 115 women with early pregnancy loss cared for in the outpatient setting show:⁹

- Minimal complications
- 3 repeat aspirations (3%)
- 2 post-procedure infections (2%)
- 1 unplanned hospital admission (resolved before intervention needed) (0.9%)

Data from randomized study comparing 89 MVA in outpatient clinic with 68 EVA in OR for treatment of early pregnancy loss show:¹⁰

- 95% effectiveness for MVA
- Minimal complications
 - 1 fever (temp $\geq 101.4^{\circ}\text{F}$) (2%)
 - 3 emergency hospital visits on same day of treatment (5%)
- No safety of side effect differences for MVA vs. EVA
- Less missed time from school or work and less need for help from others in MVA patients

pregnancy through 12 weeks of gestation. There were no major complications, and the minor complications of retained products of conception were managed with the standard vacuum aspiration.

The rate of complications with MVA was on the same low level as EVA. The difference between an estimated blood loss of 35 and 42 mL is not clinically important.

- **Cervical laceration:** If treatment is needed, hemostatic agents like silver nitrate may be sufficient for minor tears. In rare situations, suturing is needed.
- **Pelvic infection:** Should post-operative infection occur, treatment depends on location and type of infection.
- **Hemorrhage:** Heavy bleeding (e.g. the soaking of a maxi-pad every 20 minutes for 1 hour) is rare but can occur following MVA. Treatment depends on the severity of hemorrhage.
- **Hematometra:** This is a condition in which the uterus is distended with clots and blood. The most likely etiology is an adherent clot in the endocervical canal from a small tear that occurred during the procedure. The uterus may be larger than before the procedure and extremely tender. This condition can be treated by re-aspirating the uterus, although dilation alone is often sufficient.
- **Vagal reaction:** Typically occurs near or after completion of the procedure. Woman may feel lightheaded or nauseated. If the procedure has not yet been completed, halt the procedure until the reaction has ceased. Have the woman lie either flat or in reverse trendelenburg with her feet raised above the level of her heart. Provide a cool compress for her forehead and the back of her neck. Once the reaction has subsided, continue the procedure.¹⁵

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Clinical Components of the MVA Procedure

MVA Instruments and Supplies¹

- MVA aspirator
- Silicone lubrication
- Cannulae (4–12 mm)
- Adaptor for cannulae
- Specula
- Tenaculum (sharp-toothed or atraumatic)
- Ring forceps
- Antiseptic solution, gauze, and small bowl
- Mechanical dilators
- Syringe, needle, and anesthetic agent for cervical block

MVA Aspirator Selection

There are nine brands of manual uterine aspirators available worldwide. Preference for brand is often determined by the needs of a particular setting.² In the United States, the IPAS™ double-valve manual aspiration syringe is the most commonly used product. The product is now designed to allow for steam autoclaving sterilization. Several US manufacturers produce cannulae that fit the IPAS syringe.³

Prevention of Infection

Use of a no-touch technique and prophylactic antibiotics can help to avoid infection. The first dose should ideally be administered 30 minutes before the procedure. The one regimen that is best supported in the medical literature is Doxycycline 100 mg, one hour before abortion, and 200 mg 30 minutes afterward.⁴

Cervical Anesthesia and Dilation of the Cervix

A paracervical or intracervical block is commonly used for vacuum aspiration abortions in North America. Deep injections using the Glick technique can be more effective than superficial injections and injecting slowly has been found to be less painful than

injecting quickly.^{5,6} The cervix should be dilated in accordance with the size of the pregnancy and the cannula the clinician plans to use. Excessive force in dilation of the cervix can cause cervical or uterine injury. In addition, overdilation should be avoided with MVA because it can compromise the vacuum pressure. Women experiencing early pregnancy loss or incomplete abortion may already have sufficient cervical dilation for the procedure. Women undergoing termination of an early pregnancy may be dilated using mechanical or plastic dilators or misoprostol.

Performance of the Procedure

The procedure is considered complete once the uterus feels empty to the clinician. (Note: If MVA is used for completion of incomplete or medical abortion, a sac may not be present.) The syringe must be emptied an average of one to three times to complete the procedure.⁷

Postprocedure Patient Monitoring

Postprocedure the patient should be monitored for signs of pain and bleeding. A clinician should be notified in the event of fever or prolonged, worsening, or severe pain or bleeding.⁸

Postoperative Tissue Examination

It is critical to examine the products of conception (POC) after completion of the procedure. Examining the tissue helps ensure that the procedure is complete. For very early gestations, POC are less likely to be disrupted during the aspiration when using MVA as compared to EVA; thus, the POC may be more easily identified.⁹⁻¹¹ Lack of complete POC identification may indicate an ongoing or ectopic pregnancy. Patients should be evaluated carefully to identify the appropriate diagnosis.

Equipment for Tissue Evaluation

- Light for procedure and backlighting
- Basin for specimen
- Fine-mesh metal strainer
- Glass dish to review POC
- Tools to grasp tissue and POC

A common technique for early tissue examination includes the following steps:

- Wash the aspirate in a fine-mesh metal strainer under running water to remove blood and clots.
- Transfer the remaining tissue into a clear glass dish containing about 0.5 inch of water or saline solution.
- Place the dish on a radiograph box or photographic slide viewer, as backlighting greatly facilitates differentiation of the pregnancy elements.¹⁰ A flashlight may provide some additional lighting if these resources are not available in the office.

Additional Issues Regarding Tissue Identification:

- A woman experiencing early pregnancy loss (i.e., miscarriage) may have already expelled the pregnancy, and thus only limited tissue may be present.
- POC from a very early pregnancy (< 6 weeks) may be difficult to identify without specialized training.
- MVA may be unsuccessful. A congenital abnormality in uterine shape, for example, may make cannula placement difficult or impossible. In such cases, the patient will need another option for clinical management.

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