# Manual Vacuum Aspiration: A Safe and Effective Alternative for the Surgical Management of Early Pregnancy Loss

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**Abstract**

**Objective:** To assess the efficacy of Manual vacuum aspiration (MVA) under local anaesthesia in the management of first trimester pregnancy loss and to assess the safety of procedure and rate of complications.

**Methods:** Prospective descriptive cross sectional study, was carried out at Chiniot General Hospital from 1st June 2012 to 31st May 2013. Uterine evacuation was carried out in 128 women with a diagnosis of first trimester miscarriage using MVA under local anaesthesia. Efficacy, safety, and rate of complications were recorded.

**Results:** Efficacy of procedure was 97.7%. Incomplete uterine evacuation was seen in 3 patients. There were no uterine perforations. Minor complication of infection and blood loss were easily treated.

**Conclusion:** Surgical evacuation of uterus using MVA under local anaesthesia is safe, effective and should be considered to avoid prolonged hospital stay.

**Keywords:** Manual vacuum aspiration, trimester first, local anaesthes. (ASH & KMDC 19(1):28;2014).

## Introduction

Miscarriage of an early pregnancy is the commonest medical complication and occurs in 10-20 % of clinically recognized pregnancies[1-3]. Local data shows an annual miscarriage rate of 29 per 1000 in women aged 15-49 years[4]. In Pakistan approximately 890,000 women present with missed miscarriage or incomplete miscarriage annually[5]. Treatment options for first trimester miscarriage include surgical, medical and expectant management. It is reported that medical management is not accepted by women due to uncertainty in predicting the success (20%-80%)[6]. Up to 88% of women with miscarriage undergo surgical evacuation under general anaesthesia[7]. Manual Vacuum Extraction (MVA) is an alternative to traditional surgical method. MVA is a technique for uterine evacuation which is safe, cost effective, simple, and portable and can be performed under local anaesthesia[8,9]. It can easily be performed in any setting, including an office, emergency room, or the operating room and may be performed by a wide range of trained medical personnel including midwives and nurses. A 60 ml hand held syringe with a self-locking plunger is used to produce the vacuum needed for the aspiration of products of conception. MVA was first described in the 1970s, initially for the management of incomplete miscarriage, but its use has been extended for the management of missed miscarriage, molar pregnancy, termination of preg-

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nancy and for endometrial sampling[2,10]. A high efficacy of vacuum aspiration with success rate between 95-100% has been reported in various trials[2,3,5,11-13]. Manual vacuum aspiration has been widely used in USA, Asian and European countries; its use in Pakistan has been limited. So far there is very little local data available on the subject. The present study was conducted to assess efficacy and safety of MVA and rate of complication in early pregnancy loss.

## Patients and Methods

This study was conducted at Chiniot General Hospital from 1st June 2012 to 31st May 2013. Primary outcome measure was to assess the efficacy of the procedure defined as complete uterine evacuation without the need for further treatment. Secondary outcome measure included safety of the procedure and rate of complications. All patients with gestational age of less than 12 weeks admitted with the diagnosis of an embryonic pregnancy, incomplete miscarriage, missed miscarriage and patients requiring evacuation following failed medical treatment were included in the study. Patients with septic miscarriage, fetal demise with gestational age more than 12 weeks, molar pregnancy, haemodynamically unstable, severe anxieties and unwilling patients were excluded from the study.

Patients with first trimester miscarriage (n=122) were required for this study on the basis of previous study which showed overall efficacy / success rate 88.2%[8] at 95% confidence interval and absolute precision 5% Using computer program Open Epi Version 2 for sample size calculated was 122[14]. Sampling technique was non-probability purposive sampling. Final sample size included was patients with MVA, (n=128).

During one year uterine evacuation was carried out in 169 patients. MVA was done in 128 patients. Gestational age was calculated by date of last menstrual period and/or ultrasound. MVA was performed in a minor theatre. As per protocol all patients were given single dose of antibiotic and pain killer parenterally, 30-45 minutes before procedure and 400 micrograms of vaginal Misoprostol, 3 hours prior to procedure for cervical ripening in patients with closed cervical os and missed miscarriage. Local anaesthesia was achieved by paracervical block (10 ml of 1% xylocaine). (International pregnancy advisory service) easy grip cannulas were used and negative pressure was obtained by using a 60 ml Ipas[15] MVA plus aspirator by attaching with cannula. Procedure ended when sign and symptoms of complete evacuation (red foam in the cannula, uterus contracting around the cannula and increase uterine cramping) felt by the patients. Patients were given oral antibiotics for five days. Patients were discharged 2 to 4 hours post MVA, if they were clinically well and haemodynamically stable with minimal bleeding and pain. All were offered follow up after one week to see any signs of infection e.g. pain in lower abdomen, vaginal discharge and fever.

The data was recorded on a pre-designed performa and analysis was on computer package SPSS (Statistical Packages of Social Sciences) version 20. Clinical characteristics were summarized in terms of frequency and percentages for qualitative variables like gravida (primary/ multi), indications and complications, and mean ± S.D of quantitative / continuous variables like age in years and gestational age in weeks.

## Results

During the study period 128 women underwent MVA. The mean ± S.D age of patient was 28.7 $\pm$ 4.00 years. Eighty-six (68.8%) women were multigravida and sixteen (16%) women were primigravida. Mean ± S.D of gestational age in weeks by ultrasound was 8.1 $\pm$ 1.4 weeks. Indications for MVA were missed miscarriage in 79 (61.7%) patients, whereas incomplete miscarriage, an embryonic pregnancy and failed medical treatment accounted for 36 (28.1%), 11 (8.6%) and 2 (1.6%) patients respectively. One patient (0.8%) had bleeding more than 200ml and required blood transfusion due to preexisting anaemia. There was no uterine perforation, cervical injury and anaesthesia related complication. Efficacy of the procedure was

97.7%. Of the 3 patients (2.3%) in which MVA failed two underwent standard curettage in operation theater and one was managed conservatively and eventually had complete miscarriage with a negative pregnancy test. There were 2 (1.6%) cases of presumed endometritis which responded to antibiotic treatment.

**Table 1.** Characteristics, of patients undergoing Manual Vacuum Aspiration (MVA) under local anaesthesia in the management of first trimester pregnancy loss.

| **Mean age (years)** | 28.70+4.0 |
|---|---|
| **Parity** | N (%) |
| Primigravida | 16 (12.5) |
| Multigravida (P1-4) | 86 (68.8) |
| Grand Multigravida (P5 & above) | 26 (18.8) |
| **Mean gestational age (wk)** | 8.08 + 1.4 |

**Table 2.** Indications for Manual Vacuum Aspiration (MVA) under local anaesthesia in the first trimester of pregnancy

| | **N (%)** |
|---|---|
| Incomplete miscarriage | 36(28.1) |
| Missed miscarriage | 79(61.7) |
| An embryonic pregnancy | 11(8.6) |
| Failed medical treatment | 2(1.6) |

## Discussion

MVA has been used worldwide for more than 30 years and has been a safe and effective procedure for the management of early pregnancy loss[15,16]. MVA has been listed as an effective and safe method of uterine evacuation by WHO[17]. Despite being simple, inexpensive and easy to handle tool, its use in most of the hospitals is restricted due to unfamiliarity of the clinicians with its use[18]. This is first study carried out at Chiniot General Hospital utilizing manual vacuum aspirator in the management of first trimester miscarriage. This study was conducted to assess the efficacy and safety of MVA under local anaesthesia in women who previously only had access to dilatation and curettage and electric manual aspiration under general anaesthesia. Efficacy of MVA in this study was 97.7% comparable to reported in the literature[2,3]. With regards to the safety and complications, MVA was found safe. There was no uterine perforation, cervical injury and anaesthesia related complications. This may be attributable to flexible, soft and easy to handle cannula used in MVA. One patient (0.8%) had haemorrhage and two patients (1.6%) had infection which is same as shown in literature[8,19]. In this study incomplete evacuation after MVA was seen in three patients (2.3%) which is same as shown in published literature[2,19-21].However, similar study conducted at Liaquat University Hyderabad in 2009[5] has shown high rate of incomplete evacuation (10%) which is may be due to inclusion of residual moles and retained products of conception after full term pregnancies.

**Table 3.** Efficacy and complication, of Manual Vacuum Aspiration (MVA) under local anaesthesia in the management of first trimester pregnancy loss. Total number = 128 patients

| | **N (%)** |
|---|---|
| Complete evacuation (Success) | 125(97.7%) |
| Incomplete evacuation | 3(2.3%) |
| Infection | 2(1.6%) |
| Hemorrhage | 1(0.8%) |

MVA could be considered routinely as an alternative option for the management of early pregnancy loss and reducing maternal morbidity and mortality especially in un trained hands. We had small number of patients in our study and data from Pakistan regarding this technique is scarce, hence multicenter studies are required to support our data. We believe that our study may help to raise interest in this technique and increase its acceptance in primary health facilities where there is

scarcity of electricity, Operation theater and anaesthetist.

## Conclusion

Surgical evacuation of uterus using MVA under local anaesthesia is safe, effective and should be considered to avoid prolonged hospital stay. MVA can be used as an effective alternative to surgical curettage. It is safe, cost effective, easily performed, avoiding general anaesthesia, need for access to theater and undue stay in the hospital.

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