

Prevalence, Indications and Complications of Manual Vacuum Aspiration at Madonna University Teaching Hospital, Elele, Rivers State, Nigeria: A Retrospective Study

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DOI: <https://doi.org/10.36348/sijog.2026.v09i08.004>

| Received: 27.06.2026 | Accepted: 19.08.2026 | Published: 24.08.2026

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Abstract

Background: Manual vacuum aspiration (MVA) is a valuable technique for uterine evacuation for early pregnancy loss and post-abortion care, especially in situations where portability, low equipment needs and the avoidance of general anaesthetic are beneficial. **Objective:** To describe the volume of MVA procedures, indications, patient characteristics and documented complications at Madonna University Teaching Hospital (MUTH), Elele, Rivers State, Nigeria. **Methods:** This was a descriptive retrospective study, where the records of women who had MVA in the Department of Obstetrics and Gynaecology were reviewed during the study period (2013-2023). Structured proforma was used for the extraction of sociodemographic, obstetric and procedural variables. Frequencies, percentages, means and standard deviations and medians and interquartile ranges were reported. The prevalence of MVA was determined by dividing the number of MVA procedures by the number of gynaecology visits in the same period, and then multiplying by 100. **Results:** 173 MVA procedures were documented in 983 gynaecology visits, resulting in a prevalence of 17.6% at the institution. Most patients were aged 20–34 years (71.1%), married (81.5%) and had secondary education (84.4%). The majority of procedures were carried out prior to 13 weeks' gestation (74.6%) and by medical officers (83.8%). The most common indication was incomplete miscarriage (161, 93.1%) followed by missed miscarriage (6, 3.5%), retained products of conception (4, 2.3%) and other indications (2, 1.2%). Five adverse outcomes were documented: uterine synechia in three patients (1.7%) and post procedure vaginal discharge in two patients (1.2%). The mean estimated blood loss was 133.3 ± 102.6 mL, with five patients (2.9%) receiving one unit of blood. The median length of hospital stay was 2 days (IQR 1–3) with 47.4% having a 1 day stay. **Conclusion:** MVA was used in the majority of cases of incomplete miscarriage accounting for 17.6% of gynaecology visits at MUTH. Blood loss, documented complications and hospital stay were minor, and most procedures were performed in the first trimester by medical officers.

Keywords: Manual vacuum aspiration, Incomplete miscarriage, Missed miscarriage, Retained products of conception, Complications, Retrospective study, Nigeria.

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INTRODUCTION

Manual vacuum aspiration is a suction technique of uterine evacuation that involves a hand-held aspirator connected to a flexible cannula. It can be done in a procedure room or outpatient setting by appropriately trained providers and does not need electricity and can help to decrease the reliance on operating-theatre time and general anaesthetic. Vacuum aspiration is an evidence-based procedural option for early pregnancy loss, and incomplete abortion, in

addition to medical and expectant management, where clinically appropriate, and is now recognised as current international guidance. [1–4]

The procedure is particularly applicable to low-resource health systems as the equipment is portable, can be reused (if reprocessing is approved), and is relatively inexpensive. Nigerian studies also show that incomplete miscarriage is the most common indication and that the rate of procedure-related complications is generally low, though there are differences in institutional use rates and

hospital-stay patterns. [9–12] Studies have also shown that MVA is highly effective for uterine evacuation, with outcomes generally similar to those of electric vacuum aspiration and conventional surgical methods. [5–8]

Despite these benefits, the safety record of MVA relies on proper diagnosis, case selection, aseptic technique, competent cervical preparation and cannula insertion, good procedure recognition, and follow-up. Possible complications involve incomplete evacuation, bleeding, infection, injury to the cervix, uterine perforation and intrauterine adhesions.^{1,2,5,8}

More information is required from local sources, such as Madonna University Teaching Hospital, to determine the use of MVA, the nature of the women undergoing MVA, and the pattern of reported complications. This information can be used to inform provider training, standardization of records, infection prevention and post-procedure monitoring.

Aim and objectives

The aim was to determine the prevalence, indications and reported complications of MVA at Madonna University Teaching Hospital, Elele.

- To assess the prevalence of MVA in gynaecology consultations in the review period at an institutional level.
- To explain the socio-demographic, obstetric and procedural features of women who had MVA.
- To identify the main indications for MVA.
- To identify the frequency and pattern of documented complications and selected clinical outcomes such as blood loss, transfusion and hospital stay.

MATERIALS AND METHODS

Study design and setting

This was a descriptive record review carried out in the Department of Obstetrics and Gynaecology, Madonna University Teaching Hospital, Elele, Ikwerre Local Government Area, Rivers State, Nigeria. The hospital offers undergraduate clinical training and medical care to River's state, Imo state and receives referral from other states around.

Study population and Study period

The study covered 2013 to 2023 data recorded in the MVA-room, theatre and medical records registers. All women who had MVA in the Department of Obstetrics and Gynaecology during the study period were included in the study population.

Eligibility criteria

Records were included if they recorded an MVA conducted at MUTH during the study period and

provided enough information to determine the procedure and at least the primary clinical indication. Records outside the study dates, records with procedures performed elsewhere, duplicate records and records with insufficient confirmation of MVA were excluded.

Sampling and data source

All available eligible records were reviewed using a census approach. Cases were selected from the theatre register and MVA-room register and their case notes were obtained from the Medical Records Department. The study proforma was used to extract data into an electronic data set.

Study variables

These variables were age, marital status, educational level, occupation, ethnicity, parity, category of gestational age, cadre of operator, indication for MVA, estimated blood loss, blood transfusion, duration of hospital stay and documented complications. Indications were categorized as incomplete miscarriage, missed miscarriage, retained products of conception and other indications, as per the study proforma. The prevalence of institutional MVA was determined by dividing the number of MVA procedures performed in the review period by the total number of gynaecology visits in the same period (983), and multiplying by 100.

The indication categories were incomplete miscarriage, missed miscarriage, retained products of conception and other indications. Documented outcome categories included absence of a recorded complication, uterine synechia and post-procedure vaginal discharge.

Statistical analysis

Data were summarised with frequencies and percentages for categorical variables. Continuous outcomes were reported as means and standard deviations and as medians and interquartile ranges as appropriate. The institutional MVA prevalence was $173/983 \times 100\%$. Descriptive methods suitable for SPSS were used to prepare analyses.

Ethical considerations

Ethical and administrative approval for the retrospective review was obtained. Due to the use of existing clinical records, informed consent was waived. Data were de-identified and treated with confidentiality and used only for the approved research purpose.

RESULTS

A total of 173 MVA procedures were recorded among 983 gynaecology visits during the study period. The institutional prevalence of MVA was therefore 17.6%, equivalent to approximately one MVA procedure for every six gynaecology visits.

Table 1: Prevalence of manual vacuum aspiration among gynaecology visits

Measure	Frequency (n)	Percentage (%)
Total gynaecology visits	983	100.0
Manual vacuum aspiration procedures	173	17.6
Other gynaecology visits	810	82.4

Table 2: Sociodemographic characteristics of women who underwent MVA (N = 173)

Characteristic	N	%
Age <20 years	13	7.5
Age 20–24 years	35	20.2
Age 25–29 years	38	22.0
Age 30–34 years	50	28.9
Age 35–39 years	27	15.6
Age ≥40 years	10	5.8
Married	141	81.5
Single	32	18.5
Primary education	13	7.5
Secondary education	146	84.4
Tertiary education	14	8.1
Unemployed	37	21.4
Student	34	19.7
Civil servant	39	22.5
Business	63	36.4
Igbo ethnicity	157	90.8
Other ethnicities	16	9.2

Women aged 20–34 years accounted for 71.1% of the cohort. Most were married, had secondary education and were engaged in business or civil service.

Table 3: Obstetric and procedural characteristics (N = 173)

Characteristic	N	%
Parity 0	53	30.6
Parity 1	33	19.1
Parity 2–4	73	42.2
Parity ≥5	14	8.1
Gestational age <13 weeks	129	74.6
Gestational age 13–28 weeks	36	20.8
Gestational age >28 weeks	8	4.6
Medical officer as operator	145	83.8
Senior registrar as operator	3	1.7
Consultant as operator	25	14.5

Nearly three-quarters of procedures were performed before 13 weeks' gestation. Medical officers performed more than four-fifths of procedures, while consultants performed 14.5%.

Table 4: Indications for MVA and documented complications (N = 173)

Variable	n	%
INDICATIONS		
Incomplete miscarriage	161	93.1
Missed miscarriage	6	3.5
Retained products of conception	4	2.3
Other indications	2	1.2
Total indications	173	100.0
DOCUMENTED COMPLICATIONS		
No documented complication	168	97.1
Uterine synechia	3	1.7
Post-procedure vaginal discharge	2	1.2
Any documented complication	5	2.9

Incomplete miscarriage was the leading indication, accounting for 161 cases (93.1%). Missed miscarriage, retained products of conception and other

indications together accounted for 12 cases (6.9%). Five women had a documented adverse outcome, giving an overall recorded complication rate of 2.9%.

Table 5: Blood loss, transfusion and hospital stay

Outcome	Summary
Estimated blood loss, mean $\pm$ SD (mL)	133.3 $\pm$ 102.6
Estimated blood loss, median (IQR), mL	100 (50–200)
Estimated blood loss, range (mL)	30–700
One unit of blood transfused	5 (2.9%)
Hospital stay, mean $\pm$ SD (days)	2.35 $\pm$ 1.98
Hospital stay, median (IQR), days	2 (1–3)
One-day hospital stay	82 (47.4%)
Hospital stay range (days)	1–13

DISCUSSION

In this retrospective study, 173 of 983 gynaecology visits were associated with MVA, with a prevalence of 17.6%. So, about one in every six women who went to the gynaecology service during the study period had an MVA. This rate shows that MVA was a significant part of the emergency and routine gynaecological services provided at the hospital. The prevalence was slightly lower than the 20.7% reported at the University of Port Harcourt Teaching Hospital, another tertiary institution in Rivers State.¹⁰ The difference between the two facilities may be attributed to differences in the referral burden, patient characteristics, availability of expectant or medical management, and local service organisation.

The most common indication for MVA was incomplete miscarriage (93.1%). This is consistent with the findings from Abakaliki, Port Harcourt, Maiduguri and other African settings where incomplete miscarriage or incomplete abortion was the main indication for MVA [9–12]. This is clinically understandable as women with incomplete miscarriage often present with vaginal bleeding, open cervical os and retained intrauterine tissue, where prompt evacuation will help to control bleeding, shorten the duration of symptoms and reduce the risk of infection. Missed miscarriage and retained products of conception are less common but are well recognised indications where rapid uterine evacuation is desired or when expectant or medical treatment is inappropriate or fails.^{1–4}

The total complication rate recorded was 2.9%, with good short-term results with MVA in this context. The lack of uterine perforation, cervical laceration or serious procedure-related haemorrhage in the reported outcomes is reassuring and lends further evidence to the continued use of MVA as an alternative to sharp curettage.^{6–8,12–14}

Uterine synechia was seen in 1.7% and post-procedure vaginal discharge was seen in 1.2% of patients. Intrauterine adhesions is a known but uncommon complication of uterine evacuation and may

be related to the amount of endometrial trauma, multiple uterine evacuations and infection, which is consistent with the low incidence found in this study and the tissue-sparing benefits of the suction methods. Vaginal discharge after the procedure was also rare and continued good aseptic technique and infection-prevention measures and prompt identification of post-procedure symptoms are important to ensure this favourable outcome.

The majority of patients had a modest blood loss with a median of 100 mL and a mean of 133.3 mL. Five women received 1 unit of blood. A small number of women may have required transfusion which may have been due to the nature of the bleeding prior to presentation, anaemia or blood loss from the miscarriage itself and not from the aspiration procedure.

Nearly half of women remained in hospital for one day and the median stay was two days. This may be due to the fact that MVA is suitable for short-stay care and may have reduced the need for prolonged admission, theatre use and pressure on hospital resources.^{1–4,9} Women with longer admission may have presented with a later gestational age, significant anaemia, greater blood loss, infection, comorbid illness or a need for longer observation. The relatively short length of stay was probably due to the majority of procedures being first trimester.

The high proportion of medical officers as operators highlights the practical involvement of trained non-specialist physicians in providing MVA services. WHO guidance advocates for task sharing for certain aspects of abortion and post-abortion care, provided providers are adequately trained, supervised and backed by referral systems,^{1,2} but provider cadre does not equate to quality. The routine competency assessment, aseptic techniques, pain management, correct identification of completion of procedure and recording of follow-up are critical.

Strengths and limitations

The study presents evidence from a tertiary institution and the total number of gynaecology visits made during the study period is used to determine the prevalence of MVA. It also documents clinically relevant parameters such as indication, gestational age, cadre of the operator, estimated blood loss, transfusion, complications and duration of hospital stay.

It was retrospective and single centre, which makes it difficult to draw causal inferences and generalise the results to all hospitals in Nigeria. Furthermore, the results were also influenced by the completeness and accuracy of the routine clinical documentation and delayed complications that occurred outside the hospital might not have been recorded. Data regarding ultrasound results, anaesthetic method, cervical preparation, antibiotic prophylaxis, pain scores, procedure time and long-term reproductive outcomes were not found.

CONCLUSION

During the study period, 983 gynaecology visits were recorded of which 17.6% were for manual vacuum aspiration. It was mainly used for incomplete miscarriage and was most often carried out by medical officers in the first trimester of pregnancy. Many patients had a low complication rate and an estimated blood loss and short hospital stay, which are signs of favourable clinical outcomes. These findings contribute to the ongoing provision of MVA as a key element of the miscarriage and post-abortion care in the hospital.

Recommendations

- Implement a standardised MVA register with fields for indication, gestational age, operator, analgesia/anaesthetic, antibiotic prophylaxis, blood loss, procedure completed, complications and discharge status.
- Continue to report the number of gynaecology visits and MVA procedures per year to enable prevalence, workload and temporal trends to be monitored.
- Periodic clinical audit of indications, completion of procedures, complications, transfusion and readmission to enhance quality assurance.
- Continue competency-based training and supervision for all cadres doing MVA.
- Introduce systematic follow-up or telephone surveillance for better detection of delayed infection, retained products and intrauterine adhesions.

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