

# Comparison of Vaginal Misoprostol with Suction Evacuation for the Management of First Trimester Spontaneous Miscarriage

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## ABSTRACT

**Aim:** To compare the management outcome of vaginal Misoprostol with suction evacuation for treatment of 1<sup>st</sup> trimester spontaneous miscarriages.

**Study Design:** Quasi Experimental Study.

**Place and duration of study:** Mother and Child health center, PIMS Islamabad, from Aug 2011 to Aug 2012.

**Methodology:** Total 60 women with early pregnancy failure were recruited in this study. These women were divided randomly into two groups i.e., Group A and Group B. Group A received medical management i.e. vaginal Misoprostol 800µg (4 Tablets of Cytotec 200 micrograms each) repeated after an interval of 24 hours once if needed and Group B underwent surgical intervention by suction evacuation. Main outcome measures were, mean management time, complete evacuation of products of conception, appearance of side effects and comparison of the costs.

**Results:** In Group A total of 73.3% and in group B 100% patients had complete evacuation. The management time was 35 hours in group A and 16 hours in Group B. Misoprostol insertion resulted in heavy vaginal bleeding and abdominal pain in 20 (66.7%), fever in 3 (10%) and vomiting in 2 (6.7%), patients. Only one patient (3.3%) had vomiting, pain and bleeding in Group B. The cost of medicine in Group A was Rs 280 and in Group B it was Rs 1500.

**Conclusion:** Surgical evacuation is costly but better than medical treatment in terms of complete evacuation in less time with minimal side effects.

**Keywords:** Misoprostol, suction evacuation, missed abortion. Termination of pregnancy, early pregnancy loss,

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## INTRODUCTION

Fifteen percent of all first trimester pregnancies end up in spontaneous miscarriages.<sup>1</sup> The risk of miscarriage varies with maternal age, may show recurrence<sup>2</sup>. The diagnosis of early pregnancy fetal demise has become increasingly common with the advent of routine scanning in early pregnancy<sup>3</sup>. It is also recognized to adversely affect on the women's psychological welfare. Therefore, the management of spontaneous miscarriage represents an important part of emergency gynecological workload. An early pregnancy failure is clinically defined as an intrauterine gestational sac having no embryo with the mean sac diameter of more than 16mm, an embryo of greater than 5mm in length with no cardiac activity. For many years, the treatment of early fetal demise has been the surgical evacuation. However, uterine curettage not only increases the costs but is also associated with both short- and long-term complications, uterine perforation, cervical tears, infection, adhesions and a risk of subsequent preterm birth<sup>4,5</sup>. As a result of this future fertility of women can be jeopardized. 400µg of vaginal misoprostol for cervical preparation can reduce the incidence of complications from vacuum aspiration for first trimester abortion<sup>6</sup>.

Another attractive option for the management of silent miscarriages is expectant management where

disease tracks its natural course, woman escapes iatrogenic problems and it seems to be cost effective. The incidence of complete miscarriage rate is variable and depends upon the duration of observation<sup>7</sup>. Expectant managements may require a two months waiting period before the occurrence of spontaneous uterine evacuation. Recently it has also been tried as a management option after incomplete evacuation of uterus instead of surgical management<sup>8</sup>. The unpredictable success rate of this mode of treatment makes it an unacceptable method of treatment to majority of patients as a routine method. In 1991, the anti-progestogen Mifepristone along with a prostaglandin analogue was licensed for use in the termination of pregnancies of ≤ 63 days amenorrhea<sup>9</sup>. This combination is currently being used for the management of early pregnancy loss as well. Mifepristone is expensive and has availability issues in many countries of the world including Pakistan. It is therefore desirable to consider use of a regimen without Mifepristone.

Misoprostol is low-priced, orally active prostaglandin analogue that is also used in the treatment of gastric ulcers. Its effects on the uterine tone are comparable to those of other prostaglandin analogues. It has been found to be effective in inducing miscarriage in the first and second trimester pregnancies. Many studies have compared the oral and vaginal routes of Misoprostol administration. Oral Misoprostol has the advantage of being convenient and discrete but is associated with unpredictability of action. Studies have shown variable

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results comparing the vaginal and oral routes of Misoprostol administration<sup>10,11</sup>. The better bioavailability of vaginal Misoprostol due to avoidance of first pass metabolism may explain the higher efficacy of vaginal Misoprostol as compared to the oral route in medical abortion. Other possible routes of administration are buccal, sublingual and even intra-uterine extra-amniotic route<sup>12</sup>, but none of the routes has proven to be a standard.

There are several studies that have evaluated the efficacy of medical treatment in early pregnancy failure, since its initial description in the late 1980's<sup>13</sup>. Majority of studies have used Misoprostol, a synthetic prostaglandin E<sub>1</sub> analogue. Many authors have stated that medical management of early pregnancy failure can be a reasonable alternative to surgical management i.e., dilatation and curettage. Medical management is proven to be more effective compared to expectant management. This study was conducted to compare the management outcome of vaginal Misoprostol with suction evacuation for treatment of 1<sup>st</sup> trimester spontaneous miscarriages.

## MATERIAL AND METHODS

The study was conducted in Pakistan Institute of Medical Sciences Islamabad, at Maternal and Child Health Centre, between August 2011 and August 2012. A total of 60 patients were studied and divided in two groups, one receiving vaginal Misoprostol and the other undergoing suction evacuation. All included women had a positive Pregnancy Test, were at less than or equal to 12 weeks of pregnancy with an Ultrasound confirmed diagnosis of early fetal demise (missed miscarriage/blighted ovum) or incomplete miscarriage. They were hemodynamically stable and had minimal vaginal bleeding. Women with scarred uterus (Previous C-Section or history of Myomectomy), known allergy to Prostaglandins, ultrasound suggestive of complete miscarriage and suspected ectopic pregnancy were excluded from the study.

A pre-designed proforma was used for the data collection. Once the diagnosis of early pregnancy loss was confirmed, the patients were randomly allocated to medical (Group A) or surgical group (Group B) after counseling and informed consent and by using block method. The side effects of both the modes of treatment were explained to the patient. The patients of medical management were offered admission or treatment on outpatient basis depending upon her choice and circumstances. In the medical management group of the study 800µg (as four tablets of 200µg) of Misoprostol was placed in posterior vaginal fornix and repeated at the interval of 24 hours if required (Two doses of 800µg). The patients were kept recumbent for 1 hour after insertion of the pessaries. The patients were allowed to go home and report the researcher who was in telephonic contact with the patients after 24 hours or if she had heavy bleeding or expulsion of the retained products of conception at any time. All the patients were advised to come to the hospital emergency any time in case of intractable side effects or dissatisfaction with the treatment. Successful management outcome for medical treatment group was considered as complete uterine evacuation without the need for surgical intervention within a week of initiation of treatment. The

medical protocol was considered a failure if expulsion did not occur within a week of starting the treatment.

In surgical group, suction curettage was done in the operation theatre per unit protocol. The need for repeat curettage for retained products of conception seen by Ultrasound was considered as failure of the surgical treatment. Main outcome measures were mean management time taken as induction to initial tissue expulsion time i.e., time in hours from the administration of drug to the expulsion of products of conception, complete evacuation of products of conception. In Group A and time since admission to discharge in group B, occurrence of side effects and comparison of the costs.

Data analysis was done using SPSS version 13. Student's t test was applied to compare the numeric variables. The numerical variables were time, total number of doses of Misoprostol used for complete expulsion of conceptus, age, parity, gestational age. Descriptive statistics were calculated. Mean ± S.D was calculated for quantitative variables. Frequency and percentages were presented for Parity, complete uterine evacuation and side effects. Chi square test was used for analysis of the discontinuous variables and for the determination of statistical significance of the differences between them. Differences were considered as statistically significant if  $p < 0.05$ .

## RESULTS

Comparison of the demographic features did not show statistical significance. The mean age was 26.8 years for medical treatment groups while for surgical management group it was 26.7 years. Mean gestational age was 10.53 weeks in Misoprostol group and 11.47 in the suction evacuation group (Table I).

Among the patients who received medical treatment 22(73.3%) patients had complete evacuation of uterus while in 8 (26.6%) this mode of treatment failed. The patients who received single dose were 9(30%) while 21(70%) required repeat insertion of the drug. All the patients undergoing surgical treatment had complete uterine evacuation and none of them required repeat curettage (Fig. I). The mean time of management was 35 hours in successful patients of group A and 16 hours in Group B (Fig II).

Figure I: Success rate of the two modes of treatment

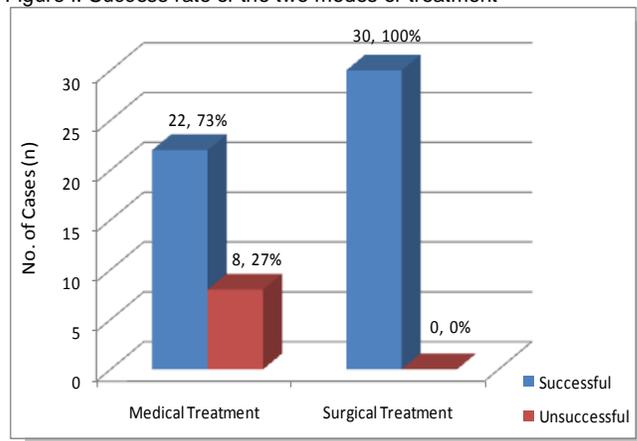
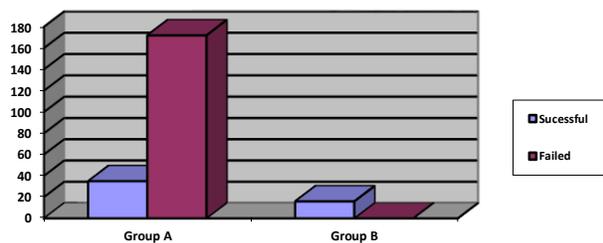


Fig II: Time of management in both groups



Misoprostol insertion resulted in vomiting in 2(6.7%) patients while abdominal pain was reported by 20(66.7%) patients. None of the patients described the onset of diarrhoea after the medication. Fever was seen in 3(10%) women after Misoprostol insertion which settled with antipyretics. Heavy vaginal bleeding was reported by 20(66.7%) of which 2(6%) patients had to undergo S&C

due to heavy blood loss. While in the surgical treatment group none of the patients experienced fever, diarrhea or had infection. Only one patient (3.3%) had vomiting in the postoperative period (Table II).

We also compared the costs of the two modes of treatment. Patients having successful medical treatment had to pay Rs. 280 as the cost of medicine. Women undergoing surgical treatment paid Rupees 1500. In case of failed medical treatment the patient had to bear the expenses of surgery in addition to the cost of medicine (Table III).

All patients who had successful medical termination of pregnancy were and satisfied with this mode of treatment. There was an advantage that the treatment can be carried out on outpatient basis and the cost of treatment was much less compared to surgery. All these women who had failed medical treatment had concerns about the unpredictability of success, prolonged time required for treatment and chances of heavy vaginal bleeding after insertion of the tablets. All patient of group B were happy

Table 1: Comparison of the Demographic Variables

Variables	Surgical Treatment		Medical Treatment		P - Value
	Mean ± S.D	Range	Mean ± S.D	Range	
Age (Years)	26.8 ± 4.67	20 - 40	26.80 ± 5.99	18 - 37	N.S
Gestational Age (Weeks)	11.47 ± 2.03	8 - 16	10.53 ± 2.15	5 - 15	N.S

Table 2: Comparison of side effects of the two modes of treatment

Side Effects	Medical Treatment		Surgical Treatment		P value
	n = 30	%	n = 30	%	
Fever	3	10.0%	0	0.0%	0.00
Diarrhoea	0	0.0%	0	0.0%	-
Vomiting	2	6.7%	1	3.3%	0.00
Abd. Pain	20	66.7%	1	3.3%	0.02
Infection	0	0.0%	0	0.0%	-
Bleeding	20	66.7%	1	3.3%	0.02

Table 3: Comparison of the costs of treatment

Medical treatment Group A		Surgical Group B
Successful	Failed	Successful
280	1780	1500

## DISCUSSION

Miscarriage is a common gynecological emergency. Medical management of miscarriage has gained popularity as it is a noninvasive but effective management option<sup>14,15</sup> Vaginal misoprostol was found most effective cervical ripening method by Chen W in 2016<sup>16</sup>. In our study, we used 800µg of Misoprostol vaginally like Seervi et al<sup>17</sup> who compared vaginal misoprostol with sublingual route. Literature search shows that in spite of an extensive research on the routes of administration, to date there is no universally agreed route and regimen of the drug for the treatment of miscarriage<sup>18,19</sup> Success rate of our medical treatment arm correlates with international results where it has been reported between 13% - 96%<sup>14</sup>. It has been seen that 15% of medical terminations may not be successful even in the hands of medical personnel.<sup>20</sup> comparing to our observation, Barcelo F observed that Misoprostol alone has a success rate of 87.8% to 90.6%, depending upon the dose of drug used<sup>21</sup> but study findings of Egarter C were similar to our study as he observed that PGE1 treatment

was effective in 76.7%, and 99.9% effectiveness of surgical management was found in his patients<sup>22</sup>. Like our study Nielsen S found that 82% of woman had complete evacuation with outpatient use of misoprostol<sup>23</sup>. Historically surgical procedure was used for management of miscarriages, medical management is often opted now, however, there is still an uncertainty about its effectiveness and risks and this large variation may be due to various factors including patient selection, the type of prostaglandin analogue, concomitant use of Mifepristone, the dosage and route of administration<sup>24,25</sup>.

The success rate according to Literature search for surgical treatment in various published studies ranges from 93% to 100%, same was a case in our study. Ansari and Abbas observed in case series that complete uterine evacuation was achieved by MVA in 100% of woman, that is one form of surgical evacuation<sup>26</sup>. In our study, the mean induction to initial tissue expulsion interval was 35.4 hours in Group A whereas Muffley et al found an interval of 12.6±2.7 hours after medication with similar dose of the drug<sup>27</sup>. Like the results of our study, Chaikof M noticed that

surgical management does not result in major intraoperative complications such as uterine perforation or excessive blood loss<sup>28</sup>. Cholkeri SA suggested that suction curettage may add in fetal genetic diagnosis by obtaining biopsy of products of conception by minimizing the risk of maternal contamination along with its low risk of surgical complications<sup>29</sup>. Like in our study, Demetroulis C observed in a prospective randomized control trial that most common side effect with misoprostol was abdominal pain that 82.5% patients had, rest were little different in frequency as 15% had nausea, 7.5% had vomiting, 2.5% had diarrhea while 60% complained of vaginal bleeding of varying severity<sup>14</sup> but Mcgee TM observed in 2016 that misoprostol is effective management for early pregnancy losses with the low complication rates<sup>30</sup>. In a recent Randomized trial published in *Contraception* 2019, Shakir-Reese JM has emphasized the need for further studies to evaluate the side effect profile of vaginal misoprostol<sup>31</sup>.

We also compared the costs of the two modes of treatment. A successful medical treatment using two doses of Misoprostol proved to be cheaper compared to the surgical treatment. However, a failed medical treatment was found to be the most expensive of all because the patient not only had to bear the expenses of medical treatment followed by surgery but had to come for follow-up again and again. Other studies<sup>32</sup> have also confirmed that the expectant and successful medical management of miscarriage has a significant economic advantages as compared to the traditional surgical treatment. More studies are required regarding the economic evaluation of alternative management options for early pregnancy failure because of the increased pressure on health care expenses.

## CONCLUSION

Surgical evacuation is costly but better than medical treatment in terms of complete evacuation in less time with minimal side effects.

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