GENERAL EDITION 60TH ANNIVERSARY

Medical versus Surgical Management of Incomplete Abortion: A Literature Review

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ABSTRACT

Introduction: Abortion is the termination of a pregnancy before the age of viability. When it occurs spontaneously, it is called a miscarriage. There are various types of abortion; a common type is incomplete abortion or miscarriage. Incomplete abortion is the partial loss of the products of conception within the first 20 weeks of pregnancy. Incomplete abortion is managed either medically or surgically.

Objectives: The article compares the medical management of incomplete abortion to the surgical management using extensive literature review focusing on the effectiveness, complications, practicality, and preferences by women and gynecologists

Methods: A literature review was conducted to compare both methods of incomplete abortion using academic search engines and databases such as Google Scholar, and PubMed; and a hand search of references from relevant papers.

Results: Research done on this subject recorded a higher success rate and lower complications in the surgical method of management than the medical method. However, especially in low-resource settings, the medical method seems a more practical approach.

Many studies also showed that more women preferred the medical method because it was non-invasive and ensured privacy. However, gynecologists prefer the latter because of its effectiveness and lower complication rates.

Conclusion: More primary studies should be done to further explore the benefits of both methods, and how they can be combined effectively to achieve optimum results.

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Keywords:
Abortion, miscarriage, surgical, medical, management

DOI: https://dx.doi.org/10.4314/dokita.v41i1.3

INTRODUCTION

Abortion is the termination of a pregnancy by removal or expulsion of an embryo or fetus before the age of viability[1]. Viability varies from one place to another. In Nigeria, the age of viability is 28 weeks[2]. An abortion that occurs without intervention is known as a miscarriage or "spontaneous abortion"; these occur in approximately 30% to 40% of all pregnancies1. An intentional termination of a pregnancy is referred to as an induced abortion. Incomplete abortion is the partial loss of fetal products within the first 20 weeks of pregnancy[1].

Incomplete abortion usually presents with pelvic and/or lower abdominal pain, along with moderate to severe vaginal bleeding. There is failure of the uterus to completely expel products of conception despite cervical dilatation. Other types of abortions include threatened abortion, inevitable abortion, missed abortion, complete abortion and septic abortion.

Overall, 10 to 15 percent of abortions occur spontaneously. There are two categories: early (less than 12 weeks) and late (more than 13 weeks)[3]. Most cases of abortion occur within the first trimester (13 weeks)[4]. It is necessary to remove products of conception (POC) to stop bleeding, infections, and structural damage[5]. Treatment of abortion is generally

divided into: expectant management, medical, and surgical treatment.

The aim of this article is to discuss the presentation and management of incomplete abortion and compare the surgical to medical management in terms of their clinical effectiveness, safety, complications, acceptability and cost effectiveness.

METHODOLOGY

Extensive literature reviews have been done on various papers that have compared medical to surgical treatment of incomplete abortion in terms of effectiveness, safety, cost implications, complications and timing of the pregnancy.

Literature review was conducted using academic search engines and databases such as Google Scholar, and PubMed; and a hand search of references from relevant papers. The search strategy included the use of key terms (medical, surgical, incomplete abortion, miscarriage). Search was limited to only peer-reviewed articles published in English Language. These terms were linked with Boolean operators such as "AND/OR". English articles that met the criteria for management of incomplete abortion and comparison between the two methods of managing incomplete abortion were used for this review.

EPIDEMIOLOGY

The exact incidence of incomplete miscarriage is not known[5]. In one study, after 1 month, 34% of anembryonic gestation had incomplete abortion, and 26% of pregnancies with embryonic demise managed expectantly did not have spontaneous completion of abortion[6]. The incidence of incomplete second-trimester abortions following surgical and medical procedures is 1% and 8%, respectively[7]

ETIOLOGY

Generally, 50% of cases of incomplete abortions are caused by chromosomal abnormalities, which cannot be prevented[8]. Additional cases are caused by modifiable etiologies and risk factors, including age, infections (Listeria monocytogenes, human immunodeficiency virus), abnormal uterine growth, maternal diseases (diabetes, hypertension, renal disease, thyroid problem, polycystic ovary syndrome, lupus, thrombophilia), and teratogen exposure (drug, alcohol, caffeine, radiation)[1].

SYMPTOMS

An incomplete abortion typically begins with moderate to severe vaginal bleeding and is often accompanied by suprapubic lower abdominal and/or pelvic pain that can radiate to the perineum, buttocks, lower back, and genitalia.

In nearly all instances, the pelvic exam will show an open cervical os with clearly visible products of conception. Some fetal tissue may have already been expelled.

The cervical os may be closed in rare instances, but some fragments of the conception may still be visible. Bradycardia and hypotension that does not respond to intravenous (I.V.) fluids can be symptoms of cervical shock, which is caused by excessive vagal stimulation at the cervix as a result of incomplete passage of the products of conception[9].

INVESTIGATION

The best way to diagnose incomplete abortions is by transvaginal or transabdominal ultrasonography, particularly transvaginal ultrasonography usually combined with quantitative human chorionic gonadotropin (hCG) testing[10]. Certain products of conception are typically detectable in the uterus through ultrasonography. Fetal heartbeats are usually absent and there will be low levels of hCG[11]. Other investigations include full blood count, grouping and cross matching, rhesus factors (Rh), and clotting profiles.

TREATMENT

Without additional medical care or surgery, the majority of these women will naturally expel the remaining fragments of the product of conception[10]. Misoprostol- and mifepristone-based medication, and surgical intervention, are available treatment options for incomplete abortions.

Medical management

The most common protocol for medical abortions nowadays consists of taking mifepristone and then Misoprostol, a prostaglandin E1 analogue[12]. This is to activate myometrial contractions and induce abortion.

Misoprostol is given orally or vaginally, sometimes in doses that are given one after the other, until a complete abortion is obtained[5]. Intravenous fluid and analgesics may be required. Blood transfusions might be necessary if the bleeding is severe[1].

Surgical management

Surgical management includes Manual Vacuum Aspiration and dilatation and curettage. Traditionally, surgical evacuation is used to terminate first trimester miscarriages [13, 14]. Following natural or assisted dilation of the cervix, manual or electric vacuum aspiration is the advised method of surgical abortion. WHO states that "due to the possibility of synechiae, dilation and sharp curettage is an obsolete technique that may be harmful"

The operating room is where surgical evacuation of retained products of conception (ERPC) is carried out. Potential risks associated with the procedure include perforation, hemorrhage, cervical trauma, intrauterine adhesions, and endometritis following instrumentation. There is a range of 4% to 10% for the overall complication rate[15, 16].

COMPARISON OF MEDICAL TO SURGICAL METHOD

Effectiveness, Safety and Complications

Interesting findings were seen in a study carried out by Shuaib et al in 2012 to compare the incidence of dilation and curettage complications with medical methods. The prospective study was carried out for over a year with 55 women in the surgical group using dilatation and curettage and 52 women in the medical group using 400 mcg Misoprostol. All women in the surgical group had successful completion whereas the success rate was 80.7% in the medical group. Infection and hemorrhage were also recorded more in the medical group thereby bringing the conclusion that surgical management may be safer than medical method[17].

A study was carried out in Iran to also compare the safety and efficacy of Misoprostol based medical method versus surgical intervention using 150 women in a randomized control clinical trial. Results showed a 96% success rate in surgical intervention as opposed to 10.6% success rate in Misoprostol use. It was also found that optimal result is obtained from the use of Misoprostol combined with surgical intervention as it prevents uterine rupture and other complications that can occur from surgical intervention[18]. A study was also carried out in 2022 by Otieno in Kampala, Uganda. It was a prospective study carried out over a year and the study also showed more effective results in the surgical method of treatment. Medical method reported more hemorrhage and symptoms of infection such as fever, nausea and vomiting, than the surgical method. Less pain, dizziness, syncope, and blood transfusion were recorded with the medical method[19]. Interestingly, a different result was seen in a study conducted by Trinder et al to assess the difference in gynecological infection in medical, surgical and expectant management. The results showed that the incidence of confirmed infection within 14 days did not differ between the expectant, medical, or surgical methods[20].

A study was done in Nigeria by Ghibu et al, 2012 to determine the effectiveness, safety and acceptability of misoprostol as an alternative to surgical management in rural area, almost all of the women underwent manual vacuum aspiration (surgical method) or oral misoprostol (98.8%), or both to achieve a complete uterine evacuation[21]. Another study done by Shochet et al also highlighted this point with misoprostol effectiveness of 94.4% and surgical method of 100.0%[22]. The study by Ghibu et al also highlighted that compared to women treated with manual vacuum aspiration (MVA), misoprostol users reported less pain but heavier bleeding in the 72 hours following treatment. The study highlighted that both MVA and 600 µg oral misoprostol are acceptable, safe, and effective treatments for first-trimester uncomplicated incomplete abortions at rural facilities[21]. Studies by Adinma et al had similar results[23]. A study by Nwafor et al in Nigeria showed that the failure rate was higher when medical treatment was used, but statistically, there was no significant difference in the efficacy of the two treatment modalities[24].

Cost Effectiveness

Xia et al carried out a study in China to determine which method has better cost effectiveness. 480 women were recruited for this study and results showed that there was no significant difference in the mean final cost between the two methods of management of incomplete abortion but there was an overall increase in final cost in medical methods as a result of more complications. This further adds to the surgical method being a more effective method in

the management of incomplete abortion[25].

After initial treatment, surgical abortion generally costs a lot more than medical abortion. However, the failure of the abortion and, in some cases, persistent bleeding caused the mean total cost in the medical group to increase significantly when the subsequent costs were added up during the 2-week follow-up period. It is also important to note that the choice of these management options is also dependent on the resources of the healthcare facility[25].

A study conducted in the United States found that misoprostol treatment for incomplete miscarriages was more cost-effective than Manual Vacuum Aspiration even after accounting for secondary costs[26]. This finding was also supported by Nwafor et al who also highlighted that the medical method was more cost-effective than the medical arm[24].

Practicality in low resource environment

Moodliar et.al carried out a study in 2005 to determine if treatment of incomplete first trimester abortion, using vaginal Misoprostol, is a practical option in a low resource setting. A total of 94 women were placed on a random sampling method to either 600 µg of misoprostol or surgical curettage. The results showed that, with 15 of the 47 successful cases occurring after just one misoprostol dose, the overall success rate of medical management was 91.5%. Treatment failure necessitated the evacuation of retained products of conception in 8.5% of the 47 women after only one week. In the surgical arm, 100% of the procedures were successful[27].

Shochet et al also compared the practicality of both methods in lower resource enforcement, the results highlighted that in low-resource settings, misoprostol is far simpler to administer than surgery and can be used safely, effectively, and satisfactorily to treat incomplete abortion[22].

Preference by women

From the various results of studies conducted on this topic, one can almost conclude that surgical method of treatment of incomplete abortion is more effective than medical method, yet women still prefer medical method to surgical method due to less pain associated with it. According to the Ugandan study, participants' satisfaction with medical management was attributed to reduced pain, efficacy, non-invasiveness, and the avoidance of anesthetic use[19]. Other studies have also confirmed this [19, 28-31]. Various studies have also showed that more infection and hemorrhage are associated with medical management [19, 28-31].

Additionally, the Ugandan study has shown that participants are happy with the surgical method due to its high efficacy, quick recovery time, shorter hours of bleeding, and shorter hospital stay [21]. This has also been demonstrated by other studies[19, 28-31]. Though Trinder et al showed that, following expectant, medical, and surgical management, the infection rates were reassuringly low and did not differ significantly[20]. According to various studies, the majority of women will select the medical option since it is safe, non-invasive, and ensures greater autonomy and privacy[19, 24, 28-33].

One thing is important, which is, various studies have offered crucial information for women to make educated treatment decisions. Studies carried out by Moodliar et al demonstrated that, despite the fact that surgical treatment is the norm for first-trimester abortions in South Africa, medical treatment is a practical alternative because it avoids hospitalization costs, frees up hospital beds, relieves staff, and cuts down on operating room time, freeing up operating rooms for other emergencies[27].

Similar results were seen in studies done by Gbihu et al which showed that patients treated with medical methods were more satisfied with the method compared to surgical method (75.6 versus 45%). These women were more likely to recommend misoprostol to a friend and choose it again (96.9 versus 55.6%)[21]. Okonofua et al also demonstrated this in his studies that almost all (96.2%) participants were satisfied or very satisfied with the medical method[33]. Nwafor et al studies also supported this notion[24]

Preference by Gynecologists

A Cross sectional study was done by Akaba, et al, 2017 in Nigeria to assess the use of misoprostol. For the management of incomplete abortion in three tertiary teaching hospitals, results showed that misoprostol was used to treat first trimester abortions in 19/343 (5.5%) while manual vacuum aspiration (MVA) was used in 324/343 (94.5%). The primary perceived obstacle to misoprostol usage for treating first trimester incomplete abortions was the provider's preference for MVA over misoprostol (32%). Other reasons included misoprostol's ineffectiveness (6%),

side effects (8%), high cost (5%), unavailability (1%), unfamiliarity with dosage regimens (1%), and others (16%)[33].

CHALLENGES AND RECOMMENDATIONS

More primary studies are required to explore further the advantages each method has over each other especially in Africa.

CONCLUSION

Incomplete abortion is relatively common and it is associated with complications that can be life threatening. It is important to study the various management options to know which offers better results that will improve the overall well-being in women with incomplete abortion.

A lower rate of complications, effectiveness, a shorter evacuation time, and consequently a shorter hospital stay are all linked to surgical uterine evacuation for first trimester missed abortions when performed with the proper procedure training. Much better results can be achieved when both methods are combined effectively and rightly.

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