

Obstetric Outcomes After Perforation of Uterine Cavity

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Abstract

Purpose: We aimed to evaluate the pregnancy characteristics and obstetric outcomes in patients after perforation of uterus.

Study design: A retrospective, case control study was conducted and included all patients who were diagnosed with uterine perforation and treated in a tertiary referral medical center between the years 1996 to 2018. Up to two deliveries after perforations were investigated.

Results: During the study period, 51 women were diagnosed with uterine perforation during gynecological procedures, including intrauterine device (IUD) insertion. The mean age of patients at the time of diagnosis was 27.9 (± 4.7) years. The majority, 76.5% (n=39), experienced perforation during IUD insertion, and 23.5% (n=12) of the patients experienced perforation during surgical procedures. Most of the patients were multiparous or grand multiparous, 45.8% (n=22) and 39.6% (n=19) respectively. Anteverted uterus found in 86.4% of patients (n=38). Five patients (9.8%) had pelvic abscesses after the IUD insertion. 50 patients had 71 deliveries subsequent the uterine perforation. One patient had intrauterine fetal death due to fetal malformations. One patient had uterine rupture. No other major obstetric complications were noted.

Conclusion: Uterine perforation may impair obstetric outcomes; the possibility of uterine rupture must be considered while managing deliveries of patients post uterine perforation.

Introduction

Perforation of the uterus may be a complication potentially resulting from any kind of uterine manipulation^{1,2}. The incidence of perforations varies from 0.1 to 5% depending on the procedure and the performer's skill level³⁻⁶. While these numbers are relatively small, it is thought that the actual prevalence of perforations is much higher, as many of perforations are unrecognized or underreported⁷. Typically, the damage occurs during dilatation of cervix or the introduction of an operative instrument⁸. Common locations for uterine perforation are the uterine fundus, the uterine anterior wall and cervix^{6,9}. Different risk factors have been identified for perforation during uterine procedures: stenotic or scarred cervix (primigravida, cervix after previous procedure or conization); altered position and direction of the uterus (retroflexion, hyperanteversion, deformity after cesarean section, fibroids or other uterine pathology); and reduced strength of myometrium (pregnancy, multiparity, infection; postpartum period and lactation - especially for IUD insertion)^{4,8-10}. Patient outcomes after uterine perforation are usually good, unless the complication was diagnosed late or there was intraabdominal organ damage³. The question arises, however, about the obstetric outcomes in those patients. There are several case reports describing uterine rupture after perforation^{11,12}. Some authors hypothesize that cases of uterine rupture in an un-scarred uterus are due to undiagnosed perforation, this hypothesis is supported by the fact that about 50% of patients with uterine rupture had previous surgical intervention¹³.

The aim of our study is to evaluate obstetrical outcomes following uterine perforation.

Materials And Methods

A retrospective, case control study was conducted at Soroka University Medical Center (SUMC) for patients treated between the years 1996 and 2018. We included all patients with a confirmed diagnosis of uterine perforation who were treated in our hospital and had subsequent deliveries. Data including demography, general health status, perforation management details and surgical reports were collected from the patient's electronic medical records. The pregnancy, delivery characteristics and perinatal outcomes were gathered from the computerized obstetric database of the Obstetrics and Gynecology department. Up to two deliveries after perforations were included. Patients with missing data were excluded from the analysis. Informed consent was not obtained due to retrospective study design. It was waived by the Institutional Review Board of Soroka University Medical Center (#SOR-0149-17 approved on August 3rd, 2017).

Statistical analysis was performed with the SPSS package, version 20 (SPSS Inc, Chicago, IL). Categorical variable data was presented using percentiles and statistical significance was tested using the χ^2 and Fisher's exact test, as appropriate. Continuous variable data was presented using mean and standard deviation, Student t-test was used for statistical analysis.

The Institutional Review Board of Soroka University Medical Center approved the study that has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments (#SOR-0149-17 approved on August 3rd, 2017).

Results

During the study period, 51 women were identified with a diagnosis of uterine perforation and subsequent delivery. The mean age of patients at the time of diagnosis was 27.9 ± 4.7 years. The majority of patients were multiparous or grand multiparous, 45.8. % (n=22) and 39.6% (n=19), respectively. Demographic characteristics are presented in Table 1. The most common procedure to cause the perforation was Intrauterine Device (IUD) insertion in outpatient clinics. 76.5% (n=39). The rest, 23.5% (n=12) of the patients experienced a perforation during surgical procedures, predominantly during dilatation and curettage. (Table 2) Anteverted uterus was found in 86.4% of patients (n=38). The most frequent location of damage was the parametria (n=17, 34%), probably after cervix or uterine isthmus perforation. Five patients (9.8%) who were referred for laparoscopy due to lost IUD were diagnosed with capsulated pelvic abscess. The abscess was asymptomatic or caused mild chronic abdominal pain; laparoscopy in all 5 patients revealed adhesions of omentum and bowel around the region of IUD location in the abdomen.

Background and uterine condition characteristics are presented in the Table 3. Study group of 51 patients had 71 deliveries subsequent to the uterine perforation. The mean time from perforation to first delivery was 46.92 ± 33.93 months. One patient had intrauterine fetal death due to fetal malformations. One patient had uterine rupture at 24 weeks gestation, following a fundal-posterior wall perforation in her

previous pregnancy. The perforation occurred during postpartum curettage due to adherent placenta. Subsequent uterine rupture manifested with acute and significant abdominal pain at 24 weeks of gestation, uterine rupture was suspected and an urgent cesarean section was performed, during which a uterine defect was identified in the perforation region and sutured. This pregnancy resulted in the neonatal death at day 3 due to prematurity complications. No other major complications were associated with any of the pregnancies. Most of patients had vaginal delivery, 84.5. % (n=60), with mean gestational age of 38.29±2.9 weeks. Placenta previa was diagnosed in one case (1%), abruption of placenta in two cases (3%), three patients had post-partum hemorrhage (PPH) (4%), and four patients (6%) underwent manual removal of the placenta (manualysis). Pregnancy course and obstetric outcomes are presented in the Table 4.

Discussion

We conducted a retrospective, case control study in the tertiary referral medical center. We identified 51 patients with a subsequent delivery following uterine perforation. Most of our patients were multiparous, a known risk factor for perforation¹⁴. The majority of our study population had an anteflexed uterus, as opposed to previous publications describing a retroverted uterus to be a significant risk factor for perforation¹⁵. A possible explanation may be uterus hyperanteflexion in these patients, but unfortunately this data was not available. The prevalence of post-partum hemorrhage among our population correlated with that reported in previous studies¹⁶.

We found an increased number of pathological placental conditions in our study group. Manualysis after delivery was documented in four patients (6%), while adherent placenta complicates 1-3% of deliveries in the general population¹⁷ and the reported incidence of manual removal of placenta is 2.7%¹⁸. Placenta previa was also found in 2% of our patients, while the incidence in the general population is reported to be 0.3-0.5 %¹⁹.

Uterine rupture occurred in one patient, manifesting with abdominal pain in a nonlaboring patient. Uterine rupture is a dramatic and rare complication which mostly occurs after cesarean section. The incidence of uterine rupture after cesarean delivery is 5.3/10 000 births^{20, 21}, whereas the incidence of uterine rupture in an unscarred uterus is estimated as 0.6/10 000²². Higher rates of maternal and fetal mortality were found in cases with rupture of an unscarred uterus, possibly as a consequence of this complication being unexpected²³. Unrecognized uterine perforation from a previous uterine procedure may be the risk factor for uterine rupture in those cases^{11-13, 24}.

Our study has several limitations. This is a retrospective study limited by sample size. The rare nature of the condition, specifically during fertility years, the underdiagnoses and underreporting all account for our small sample size. We also have heterogeneity in perforation type and treatment. Our data suggests that previous uterine perforation may be a significant risk factor for obstetric complications. This data

supports implementing preventive measures during uterine procedures such as cervical priming for all patients and the use of sonographic guidance in such procedures when appropriate²⁵.

Our findings emphasize the importance of previous history of uterine manipulation or perforations in the management of a current pregnancy, further studies are needed to establish appropriate recommendations.

Conclusion

Precautions should be taken during all intrauterine procedures, especially in multiparous women. Ultrasound guidance may be considered according the circumstances. In cases of labor following uterine manipulation or perforation, extra care must be taken to improve outcomes.

Declarations

Conflict of Interest: the authors report no conflict of interest.

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Tables

Table 1. Demographic characteristics for patients delivered following perforation of uterus.

Variables	Value
<u>Ethnicity</u>	
Jewish	19 (26)
Bedouin	37 (74)
Maternal age	27.94±4.74
Gravidity	4.02±2.14
Parity	3.73±2.18
Primiparity	7 (14.6)
Grand multiparity	19 (39.6)

Data is presented as number (percentage), mean ± standard deviation

Table 2. Perforations characteristics and management data for patients who delivered following perforation of uterus.

Variables	Value
<u>Perforation site</u>	
Fundus	9 (18)
Posterior wall	12 (24)
Anterior wall	7 (14)
False root	5 (10)
Parametria (through cervix)	17 (34)
<u>Perforation event</u>	
IUD insertion	39 (76.5)
Surgical procedure	12 (23.5)
<u>Management</u>	
Follow up	7 (13.8)
Laparoscopic IUD removal	41 (80.3)
Laparoscopic coagulation or suture	3 (5.9)
Abscess and adhesions	5 (10.0)
Time from perforation to delivery (months)	46.92±33.93

Data is presented as number (percentage), mean ± standard deviation

IUD, intrauterine device

Table 3. Background and uterine condition characteristics for patients delivered following perforation of uterus.

Variables	Value
<u>Background medical conditions</u>	
Diabetes Mellitus	1 (2)
Hypothyroidism	2 (3.9)
Obesity	6 (11.8)
Recurrent abortions	3 (5.9)
<u>Uterine conditions</u>	
Previous cesarean sections	8 (11.7)
Septate uterus	1 (2)
Bicornuate uterus	1 (2)
Uterus myomatosus	1 (2)
<u>Uterine position</u>	
Anteversion	38 (86.4)
Retroversion	12 (13.6)

Data is presented as number (percentage)

Table 4. Pregnancy complications and obstetric outcomes among patients following perforation of uterus.

Variables	Value
Preterm contractions	3 (4.2)
PROM	2 (2.8)
Gestational diabetes mellitus	2 (2.8)
Preeclampsia	1 (1.4)
Placenta previa	1 (1.4)
Placenta accreta	0 (0.0)
Placental abruption	2 (2.8)
Gestational age at delivery	38.29±2.89
Spontaneous vaginal delivery	60 (84.5)
Vacuum delivery	1 (1.4)
Cesarean section	10 (14.1)
Manual removal of the placenta	4 (5.6)
Postpartum hemorrhage	3 (4.2)
Uterine rupture	1 (1.4)
Birthweight	3270.9±721.2
Apgar at 1'	8.4±1.8
Apgar at 5'	9.7±1.5

Data is presented as number (percentage), mean ± standard deviation

PROM, premature rupture of membranes