

# A retrospective Study of Emergency Obstetric Hysterectomy in Iran for a Period of 3 Years Abstract

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## ABSTRACT

**Introduction:** Peripartum hysterectomy is a destructive complication and termination of pregnancy, especially in women who have tended to maintain fertility. It seems that by identifying the risk factors related to placenta accreta syndromes and, on the other hand, increasing skills in proper and timely management of postpartum hemorrhage, better results can be achieved in reducing the frequency and complications of this operation.

**Materials and Methods:** This cross-sectional study was conducted on 92 pregnant women who underwent peripartum hysterectomy due to control of postpartum hemorrhage and placenta accreta syndrome during 2016 to 2020.

**Results:** The results showed that 77.2% of all women in the statistical population underwent hysterectomy due to placenta accreta. In 82.2% of cases, the correct diagnosis of placenta accreta was made with 2D and Doppler ultrasound. A direct relationship was shown between the presence of placenta previa and hysterectomy. 68.5% of hysterectomies were performed in emergency conditions due to accreta syndromes. 67.4% of patients did not have any complications during and after surgery.

**Discussion and Conclusion:** The results of this study research that the most common hysterectomy is related to placenta accreta, which is a type of hysterectomy related to placenta previa due to abnormal placenta accreta. The mortality and mobility resulting from this surgery can be reduced by correctly identifying accreta syndromes using prenatal ultrasound and performing elective surgery with the presence of a multidisciplinary team.

**Keywords:** Hysterectomy, Peripartum, Placenta Accreta, Postpartum Hemorrhage

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## INTRODUCTION

Emergency peripartum hysterectomy (EPH) is an open surgery to save lives in life-threatening postpartum hemorrhage in situations where conservative methods are unable to control hemorrhage [1, 2]. Although medicine has made great strides in obstetrics and its technologies, hemorrhage is still a major cause of death in mothers [3]. On the other hand, the acute nature of blood loss and unplanned surgery in emergency situations causes this operation to be performed in sub-optimal conditions, which in turn increases complications during and after surgery. In recent years, along with the increase in the number of cesarean sections, abnormal placental formation as a major cause of peripartum hysterectomy is increasing in developed countries [3]. Uterine atony is still one of the main causes [4-6]. The prevalence of peripartum hysterectomy in different parts of the world varies from 0.2 to 7.8 per 1000 births due to differences in antenatal and obstetric care standards, number of cesarean deliveries, age and parity of pregnant women, access to blood and blood products, and minimally invasive treatments such as arterial embolization [7-9]. However, it seems that by identifying the risk factors related to adhesion syndromes and abnormal placenta implantation and, on the other hand, increasing the skills in the proper and timely

management of postpartum hemorrhage, better results can be achieved in reducing the incidence and complications of hysterectomy. Therefore, this study aims to investigate the frequency, causes, and complications of peripartum hysterectomy and to investigate the risk factors.

## MATERIALS AND METHODS

This cross-sectional study was conducted between 2016 and 2020. The statistical population included 92 patients who underwent peripartum hysterectomy to control postpartum hemorrhage and placenta accreta syndrome in public hospitals of Izadi, Beheshti, Shohada and Forghani in Qom and Shohadaye Tajrish Hospital in Tehran. Patients' information was collected through a questionnaire, including patient demographic characteristics, gestational age, race, type of previous deliveries and history of postpartum hemorrhage, history of previous surgery or intrauterine manipulation, history of curettage, placenta location, placenta accreta diagnosis using ultrasound or MRI, cause of hospitalization, history of bleeding during pregnancy, type of delivery and estimation of postpartum hemorrhage, need for transfusion, minimally invasive measures to control bleeding following uterine atony including medications and tamponade and arterial ligations, time of presence of a second surgeon to perform a

hysterectomy, type of uterine incision in placenta accreta cases, complications during and after surgery, and mortality, and was statistically analyzed by SPSS software version 21.

**RESULTS**

SPSS software was used in two levels of descriptive and inferential statistics to analyze the research data. According to Table 1, the frequency of patients was studied and it was found that most patients are related to Forghani Hospital (tertiary center in Qom) with 31 patients. Out of 71254 cases of vaginal delivery and cesarean section performed during the study in 4 hospitals of Qom, there were 73 cases of peripartum hysterectomy, and out of a total of 5077 cases of vaginal delivery and cesarean section performed in Shohadaye Tajrish Hospital, there were 19 cases of peripartum hysterectomy. Study of the nationality of patients admitted to the hospital due to hysterectomy showed that there were Afghan and Pakistani nationals among them, including 73.9% Iranians, 22.8% Afghans and 3.3% Pakistanis.

Table (1): Frequency distribution of patients in hospitals in descriptive evaluation of public hospitals in Qom and ShohadayeTajrish Hospital in Tehran

Hospital	Simple frequency	Relative frequency	Cumulative relative frequency
Izadi	16	17.4	17.4
Beheshti	14	15.2	32.6
Tajrish Tehran	19	20.7	53.3
Shohada	12	13.0	66.3
Forghani	31	33.7	100.0
Total	92	100.0	

The highest frequency of age in the statistical population was between 36 and 40 years (41.3%) (Table 2).

Table (2): Frequency distribution of age in descriptive evaluation of patients in public hospitals in Qom and Shohadaye Tajrish Hospital in Tehran

Age (years)	Simple frequency	Relative frequency	Cumulative relative frequency
20 to 25 years	4	4.3	4.3
26 to 30 years	16	17.4	21.7
31 to 35 years	31	33.7	55.4
36 to 40 years	38	41.3	96.7
41 to 45 years	3	3.3	100.0
Total	92	100.0	

Study of frequency distribution of gravida in hysterectomy patients showed that patients with gravida 3 (35.9%) had the highest gravida among hysterectomy patients in Qom hospitals and Shohadaye Tajrish Hospital (Table 3), of which hysterectomy patients with parity 2 (45.7%) had the highest frequency among patients (Table 4).In the study population, 94.6% of patients had singleton deliveries, of which 92.4% had no history of previous surgery or intrauterine manipulation, and only 7.6% of them had a history of curettage.

Table (3): Frequency distribution of gravida in descriptive evaluation of hysterectomy patients in Qom hospitals and Shohadaye Tajrish Hospital in Tehran

Gravida	Simple frequency	Relative frequency	Cumulative relative frequency
1	3	3.3	3.3
2	12	13	16.3
3	33	35.9	52.2
4	16	17.4	69.6
5	18	19.6	89.1
6	6	6.5	95.7
7	2	2.2	97.8
8	1	1.1	98.9
10	1	1.1	100
Total	92	100.0	

Table (4): Frequency distribution of parity in descriptive evaluation of hysterectomy patients in Qom hospitals and Shohadaye Tajrish Hospital in Tehran

Parity	Simple frequency	Relative frequency	Cumulative relative frequency
0	3	3.3	3.3
1	15	16.3	19.6
2	42	45.7	65.2
3	15	16.3	81.5
4	13	14.1	95.7
5	2	2.2	97.8
6	1	1.1	98.9
7	1	1.1	100
Total	92	100.0	

In this study, it was found that 72 cases (77.2%) underwent hysterectomy with the diagnosis of placenta accreta, of which 6 cases of normal placental pathology were reported and 64 cases had pathology based on placenta accreta, including 10 patients who were not diagnosed by prenatal diagnostic methods including ultrasound or MRI (Table 5). In other words, 54 cases (84.3%) that definitely had placenta accreta based on the pathology result were diagnosed during pregnancy. In most cases (82.2%), 2D and Doppler ultrasound was used to diagnose placenta accreta. 47 cases (73.3%) were reported to be accreta according to the pathology, 12 cases (19%) were increta and 5 cases (7.8%) were percreta. The most common reason for patients to go to hospital is placenta accreta and are related to Forghani Hospital

Table (5): Frequency distribution of diagnostic method for placenta accreta in descriptive evaluation of hysterectomy patients in Qom hospitals and Shohada Tajrish Hospital

Diagnostic method	Simple frequency	Relative frequency	Cumulative relative frequency
sono	47	65.2	80.4
MRI	3	4.1	83.7
both	12	16.6	96.7
adam tashkis	10	13.8	100.0
Total	72	100.0	

Among the patients studied, 58.2% of patients had placenta Previa that only 6 of them (11/2%) did not have placental accrete. 21% had gestational diabetes, 6.6% had hypertensive disorders, 13% had anemia, and 18.5% had hypothyroidism. Of the studied patients, 90% have no antepartum hemorrhage, 4.3% have 2nd trimester hemorrhage and 5.4% have 3rd trimester hemorrhage. Also, 68.5% of patients had emergency cesarean delivery, 27.2% had elective cesarean delivery, and 4.3% had spontaneous vaginal delivery.

Out of 20 patients who underwent hysterectomy due to reasons other than placenta accreta, 10 cases had uterine atonic and 6 cases had placenta previa. In the meantime, minimally invasive measures including tamponade and uterine artery ligation were performed in 7 cases (43%) before hysterectomy. In none of the atonic cases, PGF2 $\alpha$  was used to control hemorrhage.

Table (6): Frequency distribution of the number of previous cesarean sections in descriptive evaluation of hysterectomy patients in Qom hospitals and Shohadaye Tajrish Hospital in Tehran

Number of previous cesarean sections	Simple frequency	Relative frequency	Cumulative relative frequency
0	10	10.9	10.9
1	17	18.5	29.3
2	42	45.7	75
3	14	15.2	90.2
4	8	8.7	98.9
5	1	1.1	100
Total	92	100.0	

According to Table 6, it was found that 82 patients (89.1%) in the study population had a previous cesarean section, of which hysterectomy patients who had at least 2 previous cesarean sections (45.7%) had the highest statistics.

In the statistical population, in 98.9% of patients, prophylaxis of the third stage of labor was controlled by injecting oxytocin. Among the studied patients, 52.7% of patients lost nearly 2 liters of blood in the third stage of labor, of which 78.9% were diagnosed with hemorrhage immediately at this stage. Hemorrhage was also estimated quantitatively in cases of cesarean delivery. 54.4% of patients received 4 or more units of pack cell, 47.7% received 4 or more units of FFP. 12.3% received 6 units or more of platelets, 7.6% received 10 units or more of cryoprecipitates, and 15.2% received fibrinogen. In all cases, there was emergency access to blood products. In 88% of cases, a hysterectomy was performed with the presence of two gynecological surgeons, and in 18 cases of placenta accreta, the second surgeon was also a gynecological oncologist. In 54.5% of cases, the second surgeon was present before the start of the hysterectomy. 86% of the patients received broad-spectrum antibiotics. 67.4% of patients did not experience any complications during surgery. The most common complications during surgery were ureteral and bladder injuries, which occurred in 18.5% and 6.5% of cases, respectively, and the repair was performed by a urologist. 6 cases also underwent coagulopathy. 63% of patients were admitted to the ICU after surgery, with an average hospital stay of 2 days.

There were 2 cases of maternal mortality, one due to CVLline implantation and hemothorax in the patient with a history of 2 cesarean sections and the fetus with renal anomaly and gestational age of 36 weeks, she underwent hysterectomy due to placenta previa in Shohadaye Tajrish Hospital in Tehran, and the other case was a 37-year-old Afghan woman with a history of 4 cesarean sections and diagnosis of placenta previa and accreta with a gestational age of 37 weeks, an elective cesarean hysterectomy was performed in Forghani Hospital in Qom and she underwent massive transfusion with 9 pack cell units, 11 FFP units, 7 platelet units and 4 cryoprecipitate units, and finally, with the diagnosis of pulmonary edema and peripartum cardiomyopathy, she expired on the seventh day after surgery.

In patients of the statistical population who underwent hysterectomy due to placenta accreta, in 61.5% of patients, skin incision was of phan type and in 50% of patients, uterine incision was performed classically or transversely in the upper segment of the uterus above the placenta based on the surgeon's judgment (not performing intraoperative ultrasound to determine the upper edge of the placenta).

## DISCUSSION

In general, peripartum hysterectomy is a destructive complication and a catastrophic termination of pregnancy, especially in women who have tended to maintain fertility [10]. It seems that by identifying the risk factors related to placenta accreta syndromes and, on the other hand, increasing skills in proper and timely management of postpartum hemorrhage, better results can be achieved in reducing the frequency and complications of this operation [11].

In a study in 2018, Huque stated that the most common cause of hysterectomy was atony (31%) and then placenta accreta (28%) [12]. In our study, it was found that among the statistical population, 72 (77.2%) underwent hysterectomy due to placenta accreta and 11% due to uterine atony. This is consistent with Sharma's study in 2016 on hysterectomy in pregnant women [13]. Sharma stated placenta accreta as the most common cause of hysterectomy in the statistical population (44%). Also, in the study of Vandenberghe et al, placenta accreta was announced as the highest causes of hysterectomy (54%) [14]. In a study conducted by Kashani et al. in 2012, they stated that 64% of the statistical population underwent hysterectomy due to placenta previa, of which 80% had a history of previous cesarean section [15]. In a study conducted by Ghotbizadeh et al in 2019 on hysterectomy in 177 patients between 2011 and 2017, the most common cause of hysterectomy was placenta previa (94.6%), which is consistent with the results of our study [5].

Since 80.4% of the subjects in this study had a history of cesarean section and 58/2% had placenta previa, which are two main risk factors for placenta accreta, the high percentage of peripartum hysterectomies is justified due to accreta syndromes (56.5%). In this study, the results showed that minimally invasive methods to control hemorrhage and mainly tamponade with bakri balloon, and in one case, a combination of uterine artery ligation and tamponade with gauze were used only in 43.7% of patients who underwent hysterectomy due to atony or placenta

previa to control postpartum hemorrhage. While in a study by Colmorn et al., on 50 cases of peripartum hysterectomy in Denmark, it was found that the hysterectomy secondary to primary and secondary atony can be prevented by measures such as adequate suturing of laceration and uterine rupture and the use of intrauterine balloons and compression sutures [16]. Also in a study by Kayem G in 2011, the use of the second line of expected treatment including tamponade balloon, compression suture, pelvic artery ligation and radiological intervention was effective in 73.9% of cases in controlling postpartum hemorrhage [17]. Choi Wah Kong, in a study of patients between 2000 and 2015, showed that the use of the second line of treatment, especially intrauterine tamponade, was associated with a reduction in the rate of hysterectomy from 40% to 9.9% [18].

Prophylactic use of Tranexamic acid in cesarean section cases and the use of PGF2 $\alpha$  and fibrinogen in the control and treatment of postpartum hemorrhage have been proposed in various studies between 2017 and 2020, and the ACOG and FIGO guidelines have also mentioned the use of Tranexamic acid and PGF2 $\alpha$  [19, 20], while in our study PGF2 $\alpha$  was not used in any of the atony cases, and Tranexamic acid was used in only one case.

In dealing with accreta syndromes, the FIGO guideline states that the multidisciplinary approach (including the presence of a gynecological oncologist, or an experienced gynecological surgeon in peripartum hysterectomy) is effective on reducing the risk of massive transfusion as well as ICU admission and the risk of re-laparotomy during the 7 days after delivery compared to managing the condition by a gynecologist alone (22A). Also, in our study, hysterectomy in 91.6% of patients who were diagnosed with placenta accreta was performed with the presence of two surgeons and in 18 cases (25%), one of the two surgeons was a gynecological oncologist, while in 36 cases (50%), the amount of hemorrhage during surgery was less than 2 liters and the need for re-laparotomy was mentioned in only 2 cases. It seems that since 63% of hysterectomies were performed due to accreta in an emergency, it could justify more than 2 liters of hemorrhage in this group of patients.

Based on the results of the study, it was found that prenatal diagnostic methods, especially the more accessible method of ultrasound, were effective in diagnosing cases of placenta accreta, so that in 82.2% of the cases of this study, placenta accrete was diagnosed with imaging methods during pregnancy and it allowed the surgeon to be more prepared during the operation (such as asking for help from a second surgeon or informing a urologist and crossmatch). And this will cause fewer complications during and after surgery.

Another result of this study is that the definitive diagnosis of accreta, which can only be made by examining the pathology of hysterectomies, was confirmed in 64 of the 72 cases that underwent hysterectomy with a diagnosis of placenta accreta.

## CONCLUSION

The results of this study indicate that the most common hysterectomy is related to placenta accreta. This type of hysterectomy is related to placenta previa due to abnormal

adhesions of the placenta. Therefore, it is recommended that the possibility of placenta previa in mothers be investigated and if confirmed, accurate and complete tests for adhesion be performed in order to be able to turn emergency cases into elective ones. It is also recommended to have a protocol in the management of postpartum hemorrhage and increase the skills of team members in the timely diagnosis and proper and timely use of medications and minimally invasive methods in the control of atony and the multidisciplinary approach in accreta cases.

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