

Maternal outcomes of conservative surgery in women with postpartum hemorrhage caused by abnormally invasive placenta

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Abstract

Aim: In this study, we aimed to compare perioperative outcomes of patients who underwent hysterectomy and uterine-sparing surgery in patients operated for the abnormally invasive placenta and to compare the results of cesarean section hysterectomy and uterus-sparing surgery which is the standard surgical approach for abnormally invasive placenta cases.

Material and Methods: The record of 45 patients who were treated for abnormally invasive placenta in our clinic between January 2011 and May 2019, were reviewed retrospectively. Fifteen of these patients underwent cesarean hysterectomy, while 30 patients underwent conservative surgery. The decision to perform conservative surgery or hysterectomy was made according to the preferences of the patients. Demographic data, amount of bleeding, gynecological and obstetric histories, laboratory parameters, blood transfusions and duration of hospitalization were recorded. Data were obtained using the hospital electronic archive database.

Results: The perioperative results of the conservative surgery group were superior to the hysterectomy group. In the perioperative period, all patients in the hysterectomy group received transfusion therapy, while 54.5% of the conservative surgery group received transfusion therapy ($p=0.04$). The mean amount of bleeding in the hysterectomy group was 2160(495-5715) mL and 1215(180-3645) mL in the conservative surgery group ($p=0.04$). When the hospitalization periods of both groups were examined, the mean duration of hospitalization was 6 (3-17) days in the hysterectomy group and 3(1-16) days in the conservative surgery group ($p=0.012$).

Conclusions: Although the standard treatment for placenta invasion anomalies is cesarean hysterectomy, conservative (uterine sparing) surgery seems to be feasible for patients who desire fertility despite surgical difficulties. Therefore, the surgical treatment of placenta invasion anomalies should be individualized.

Keywords: Conservative treatment; hysterectomy; placenta accreta; placenta increta; placenta percreta; placenta previa

INTRODUCTION

In recent years, the increase in cesarean rates has led to an increase in placenta invasion anomalies, incidence of placenta on the cesarean scar and maternal morbidity and mortality (1).

Placenta previa is an obstetric complication that placenta is located in the lower uterine segment and partially or completely closes the internal cervical os (2). Patients with placenta previa are at increased risk of peripartum hysterectomy due to uncontrolled bleeding. This may result in loss of fertility or maternal complications (3).

The most important risk in patients with placenta previa is the placenta accreta spectrum (PAS) with a high risk of mortality and morbidity. PAS; is the condition that the placenta is invaded the myometrium and severe bleeding

may occur in these cases (2). Placental invasion anomalies are defined as accreta / increta / percreta according to the depth of myometrial invasion of the uterus. The incidence of PAS is 3 species per 1000 births (4). The incidence of PAS correlates with the number of previous cesarean section (5). Other risk factors that increase the risk of PAS are the increased number of births, maternal age, previous uterine surgeries and endometrial damage (6).

Peripartum hysterectomy is the recommended treatment if intraoperative diagnosis becomes clear in patients with PAS. However, in the literature, there are cases in which fertility-sparing methods have been performed without hysterectomy as a large number of case reports (7-9).

Our clinic is a tertiary center in Konya region. The patients who have applied to the health institutions in Konya region

Received: 14.12.2019 **Accepted:** 06.03.2020 **Available online:** 25.05.2020

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who have had previous cesarean section and placenta previa are referred to our clinic because of possible PAS. *The American College of Obstetricians and Gynecologists* (ACOG) recommends a planned cesarean section hysterectomy from week 35 in the presence of PAS(10). However, because of sociodemographic characteristics in our country, especially families without children or having few children demand fertility-sparing treatment despite repeated cesarean section. For this reason, the fertility-sparing approach was performed to selected patients in our clinic.

In this study, we hypothesized that conservative surgery is as effective as hysterectomy. We compared the patients who underwent peripartum hysterectomy and who had conservative surgery in terms of hemoglobin results, estimated blood loss and duration of hospitalization.

MATERIAL and METHODS

In this case control study, we retrospectively reviewed the files of patients who underwent surgical treatment for PAS between January 2011 and May 2019 in the Obstetrics and Gynecology Department of our hospital. Approval was obtained from the Ethics Committee of the institution before the study. A total of 48 patients who underwent surgery for PAS were screened. The decision to perform conservative surgery or hysterectomy was made according to the preferences of the patients.

Three patients who were performed hysterectomy instead of conservative surgery were excluded from this study. Fifteen patients who underwent peripartum hysterectomy and 30 patients who underwent conservative surgery for the placenta invasion anomaly were included in the study.

Patients were compared in terms of demographic characteristics, estimated blood loss, blood transfusions, and duration of hospitalization. The placenta invasion anomaly was diagnosed by abdominal, vaginal and Doppler ultrasonography in our clinic.

In the sonographic evaluation, PAS was diagnosed by the findings which consistent with placental adhesion (the presence of a large lacunes in the placental area, the disappearance of the retroplacental hypoechogenic region, the thinning of the retroplacental myometrial distance, and hypervascularization between the lower uterine segment and the bladder in the Doppler evaluation, turbulent flow in the lacquer) (11).

The diagnosis was confirmed by intraoperative observation and pathology evaluation. The presence of placental invasion anomaly was identified by the difficulty during removal of the placenta in the operation and intense hemorrhage in the placental bed after removal or macroscopic appearance of invasion anomaly prior to uterine incision, or pathological examination of the placenta and/or hysterectomy material alone. Placenta invasion depth was classified based on the *Federation*

of International of Gynecologists and Obstetricians (FIGO) guide according to perop findings (12). The bladder was evaluated by intraoperative cystoscopy in patients with suspected placenta percreata, and ureteral catheters were inserted intraoperatively.

Our conservative surgical management involved an intracavitary suture technique after the proximal branch of the uterine artery was clamped and utero –ovarian anastomoses had been blocked (9). Hysterectomy was performed in patients whose bleeding could not be controlled during the operation. All hysterectomies in the control group were performed as total abdominal hysterectomy. Intraoperative blood transfusion was given based upon the patient's vital signs, estimated intraoperative blood loss, and hemoglobin value. Postoperative blood transfusion was carried out based on the patient's hemoglobin value below 7 g/dL.

All data collected for statistical analysis were analyzed by the *Statistical Package for the Social Sciences*, version 23, SPSS Inc., Chicago, IL (SPSS). The Shapiro-Wilk test was used to determine whether the values of both groups showed normal distribution. While normal distribution data were compared with the Student T test, the Mann Whitney U test was used for non-distribution data. The categorical data of both groups were compared with the Chi square test. In cases where the chi-square test was not fulfilled, The Fisher exact test was performed. Statistical significance was defined as $p < 0.05$.

RESULTS

Forty-five patients with placenta invasion anomaly were included in the study. According to FIGO classification, 31 patients (68.9%) were grade 5-6, 4 patients (8.9%) were grade 3-4 and 10 patients (22.2%) were grade 1-2.

Thirty patients were performed conservative surgery and 15 patients were performed total abdominal hysterectomy.

There was no statistically significant difference between the groups in terms of maternal age, previous cesarean section, preoperative hemoglobin values, postpartum hemorrhage history and the gestational week at birth(p values respectively 0.48, 0.56, 0.30), but parity values were significantly higher in hysterectomy group compared to conservative surgery group ($p < 0.05$) (Table 1).

While all patients in the hysterectomy group received perioperative transfusion, 54.5% of the patients in the conservative surgery group received transfusion ($p = 0.04$). (Table 2). The mean amount of bleeding in the hysterectomy group was 2160 (495-5715) mL and 1215 (180-3645) in the conservative surgery group ($p = 0.028$). The duration of hospitalization of the two groups was 6(3-17) days in the hysterectomy group and 3(1-6) days in the conservative surgery group, and this difference was statistically significant($p = 0.012$) (Table 2).

Table 1. Comparison of demographic and laboratory data between groups

	Hysterectomy Group (n=15)	Conservative surgery group(n=30)	P value
Maternal age (year)*	34(27-37)	33(22-39)	0.85 ^a
Previous cesarean section*	2(0-3)	2(0-5)	0.26 ^a
Preoperative Hb value(gr/dL)**	11.3±1.1	11.5±1.4	0.48 ^b
Postpartum hemorrhage history***	1(%6.7)	1(%3.3)	0.56 ^d
Parity*	5(3-7)	3(1.9)	0.006^a
Gestational age at birth (week)*	34(27-41)	35(32-37)	0.30 ^a
Placental invasion grade***			
Grade 1-2	1(6.6)	9(30)	
Grade 3-4	2(13.3)	2(6.6)	0.186 ^c
Grade 5-6	12(80)	19(63.3)	

hb: Hemoglobin; Abnormally distributed data are presented as median (minimum-maximum)*, normally distributed data are presented as mean±SD**. n (%)***. Comparison between groups was made by Student T test ^a, the Mann Whitney U test ^b, The Fisher Exact Test ^c, and The Chi square ^d test. p<0.05 was considered significant. Significant p values are shown in bold

Table 2. Comparison of the groups in terms of perioperative outcomes

	Hysterectomy Group (n=15)	Conservative surgery group (n=30)	P value
Number of patients received transfusion therapy**	15 (%100)	18 (%54.5)	0.04^a
Estimated blood loss (mL)*	2160 (495-5715)	1215 (180-3645)	0.028^b
Duration of hospitalization (day)*	6 (3-17)	3 (1-6)	0.012^b

Abnormally distributed data are presented as median (minimum-maximum)*, n (%)** Comparison between groups groups was made by the. Chi square ^a and the Mann Whitney U test ^b. p<0.05 was considered significant. Significant p values are shown in bold

DISCUSSION

The optimal surgical management of PAS is still unclear due to the lack of randomized controlled trials (13). There are few studies in the literature for the applicability of the conservative approach. Our study demonstrated that conservative surgery may be an alternative to cesarean hysterectomy for the treatment of patients with PAS.

Shabana et al. reported a modified surgical approach in the form of a stepwise cesarean section in their study of 71 patients with placental percreta. After removing the fetus by horizontal uterine incision, they ligated bilateral uterine arteries. Then they resected most of the adhesive myometrial region (14). In this study, the importance of conservative surgery was emphasized.

Previously, Su et al. published a retrospective study of 8 cases of placenta invasion anomalies in which the placenta was left in the uterine cavity and recommended cesarean hysterectomy as the primary treatment for placenta invasion anomaly (7).

A recent retrospective study of 79 patients who diagnosed PAS compared women who underwent hysterectomy with placenta removal and expectant management. It was reported that expectant management was associated with less blood loss and need for transfusion and complication rates did not differ (15).

Karaman et al. stated that local resection may be an effective and safe alternative to cesarean hysterectomy in placental percreta cases. In another study performed by the same study group, they performed the local resection technique for postpartum hemorrhage and uterine protection in 12 pregnant women diagnosed with abnormally invasive placenta in the prenatal period and then delivered by cesarean section (8). Kilicci et al. also successfully treated placental percreta cases by partial resection in selected cases (16). In this study they examined a modified minimally invasive uterine preservative surgical technique by segmental resection of the anterior wall of the uterus. They performed a modified segmental resection technique on 11 pregnant women with placenta previa and placenta percreta.

In a study conducted in 38 PAS patients in our country, hypogastric artery ligation and lower uterine segment endouter hemostatic sutures have been demonstrated to reduce hysterectomy rates compared to other conservative methods (17).

In our study, the conservative treatment approach was to block the uterovarian hemostasis by clamping the uterine artery after the proximal branch and clamping the suspansory ligament of the ovary and resecting the placenta with the uterine tissue, after that to control bleeding areas by intracavitary sutures (9).

Since the intracavitary suture technique performed in our clinic starts from the uterus, it involves placental area suturing rather than a compression technique and prevents obliteration of the cervical canal. It also provides the opportunity to directly observe the bleeding area in the lower segment of the uterus with this method.

Patients with an antenatal diagnosis should be operated with an experienced team under elective conditions. In their study, Çorbacioğlu et al. demonstrated that

peripartum blood loss and blood transfusion requirements were less in patients who underwent planned cesarean hysterectomy compared to emergency cases (18). In our study, both patients undergoing conservative surgery and patients undergoing cesarean hysterectomy were clinically diagnosed beforehand and operations were performed after necessary preparations were made.

Studies have been associated with the shorter duration of hospitalization in cesarean hysterectomy. In our study, the duration of hospitalization was less in patients who underwent conservative surgery compared to those who underwent cesarean hysterectomy. We attributed significantly less hospitalization time and less bleeding to patients undergoing conservative surgery, with placental bed suture and partial resection to control placental bleeding more quickly and effectively. Conservative surgery seems to be a feasible method. Moreover, in our retrospective study, the amount of bleeding was less in patients who underwent conservative surgery compared to patients who underwent cesarean hysterectomy.

This study has some limitations. Our study is not a prospectively organized randomized controlled trial. The surgical procedures were performed by different surgical teams.

This study is not sufficient for a clear interpretation because it is not a prospective randomized controlled study and it contains a limited number of cases. More recent studies are needed in this regard.

CONCLUSION

This study demonstrated that the duration of hospitalization estimated bleeding rates and transfusion rates were less in patients who underwent conservative surgery in PAS. The result of this study is that cesarean hysterectomy should not be considered as the definitive treatment method in PAS and conservative surgical methods can be discussed in these patients. In cases where conservative surgery is planned, the conditions for conservative surgery should not be forced further if the intraoperative success rate is low. It should be kept in mind that the morbidity and mortality rates of such cases are high. The techniques used in conservative surgery vary according to the surgeon's experience and the intraoperative clinical outcome of the patient. Therefore, there is no standard surgical management. Although the standard treatment for placental invasion anomalies is cesarean hysterectomy, conservative (uterine sparing) surgery seems to be feasible for patients who desire fertility. Therefore, surgical treatment of placental invasion anomalies should be personalized.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical approval: Approval was obtained from the Ethics Committee of the institution before the study(2019/1838).

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