

# Retrospective analysis of placenta accreta: management strategies – evaluation of 41 cases

## Retrospektywna analiza 41 przypadków łożyska wrośniętego – strategie postępowania

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### Abstract

**Objective:** The aim of the study was to evaluate maternal characteristics, surgical treatment options, and morbidity of patients with placenta accreta.

**Methods:** We retrospectively reviewed the medical records of placenta accreta patients who were diagnosed and hospitalized between 2006 and 2010 at the Obstetrics and Gynecology Clinics of the Dicle University Hospital (Center A) and Maternity Hospital (Center B) in Diyarbakir, Turkey. The data were retrieved from medical charts of both hospitals. Maternal demographic features, clinical outcomes, type of surgical intervention, and complications were evaluated.

**Results:** The incidence of placenta accreta was 1/426 deliveries in Center A and 1/7573 deliveries in Center B over a 5-year period. Thirty-nine (95.1%) patients had placenta previa, and 32 (78.0%) patients had at least one previous cesarean delivery. Hysterectomy was performed in 28 (68.3%) of 41 women with placenta accreta and uterine preservation was achieved in 13 (31.7%) of them. One (2.4%) maternal death occurred. Estimated blood loss was >2 liters and all patients required blood products transfusion.

**Conclusion:** Placenta accreta is highly associated with the existence of placenta previa, especially in cases with previous cesarean delivery. When placenta accreta is diagnosed or suspected, the patient should be referred to a tertiary center for optimum care, where the obstetrical team should include experienced pelvic surgeons who are capable of performing emergent hysterectomy, internal iliac artery ligation, and uterine devascularization procedures.

Key words: **placenta accreta / incidence / surgery / cesarean section /**

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## Streszczenie

**Cel:** Celem badania była analiza czynników matczynych, metod leczenia chirurgicznego i zachorowalności pacjentek z łożyskiem wrośniętym.

**Metody:** Retrospektywnie przeanalizowano historie chorób pacjentek z łożyskiem wrośniętym, które zdiagnozowano i leczono w latach 2006 do 2010 w Klinice Ginekologiczno-Położniczej w Dicle University Hospital (ośrodek A) oraz Maternity Hospital (ośrodek B) w Diyarbakir, Turcja. Dane do analizy uzyskano z dokumentacji obu szpitali. Oceniono czynniki matczyne, demograficzne, wyniki leczenia, rodzaj zastosowanej interwencji chirurgicznej i jej powikłania.

**Wyniki:** Częstość występowania łożyska wrośniętego wynosiła 1/426 porodów w ośrodku A i 1/7573 porodów w ośrodku B w okresie 5 lat obserwacji. Trzydzieści dziewięć (95,1%) pacjentek miało łożysko przodujące a 32 (78%) kobiety podawały co najmniej jedno cięcie cesarskie w przeszłości. Usunięcie macicy wykonano w 28 przypadkach (68,3%) spośród 41 kobiet z łożyskiem wrośniętym, natomiast u 13 z nich (31,7%) udało się zachować macicę. Jedna (2,4%) pacjentka zmarła. Szacowana utrata krwi wynosiła ponad 2 litry i wszystkie pacjentki wymagały przetoczeń preparatów krwi.

**Wnioski:** łożysko wrośnięte jest istotnie związane z łożyskiem przodującym, zwłaszcza w przypadkach cięcia cesarskiego w wywiadzie. W sytuacji rozpoznania lub podejrzenia łożyska przodującego, należy przekazać pacjentkę do ośrodka trzeciego stopnia referencyjności celem uzyskania optymalnej opieki nad chorą. Do ośrodka, w którym wśród położników będą doświadczeni chirurdzy miednicy mniejszej będący w stanie wykonać natychmiastowe usunięcie macicy, podwiązanie tętnicy biodrowej wewnętrznej i inne procedury zmniejszające unaczynienie macicy.

Słowa kluczowe: **łożysko wrośnięte / częstość występowania / leczenie chirurgiczne / cięcie cesarskie /**

## Introduction

Placenta accreta is an uncommon but important complication of pregnancy and is associated with high maternal and fetal mortality and morbidity. It is described as partial or total adherence of placental trophoblasts through the endometrium and beyond Nitabuch's layer due to a defect in the decidua basalis [1]. The placenta does not separate properly from the uterus after delivery, which gives rise to maternal hemorrhage.

Risk factors include advanced maternal age, smoking, recurrent abortions, and multiparity, but the strongest associations are with placenta previa and prior uterine surgery [2, 3]. The frequency of placenta previa is steadily increasing because of increased numbers of cesarean deliveries. As cesarean deliveries are more commonly preferred, the relationship between prior uterine surgery and the risk of placenta previa and accreta becomes significant [4]. Here, we present a series of placenta accreta patients who were managed over a 5-year period.

## Methods

This was a retrospective study of pregnant women with placenta accreta who were diagnosed and hospitalized between January 2006 and December 2010 at Obstetrics and Gynecology Clinics of Dicle University Hospital (Center A) and Maternity Hospital (Center B) in Diyarbakir, Turkey.

Hospital A is a tertiary referral center in the southeast Anatolian region, and hospitals in 11 cities refer their complicated pregnancies to this center. Patients were identified according to information from a pre-existing clinical database and medical records.

The criteria that were used to diagnose placenta accreta were as follows:

1. placenta that was partially or totally adherent to the uterine wall without easy separation at the time of surgery and no cleavage plane between the placenta and the uterus, and

2. severe bleeding from the implantation site after forced placental removal during cesarean delivery.

Abnormal placentation comprises a spectrum of situations defined as placenta accreta, increta, and percreta depending on the degree of uterine invasion [5]. We used the term 'placenta accreta' to simplify the analysis. With the exception of one patient in which that placenta was left in the uterus the placentas were removed manually at the time of the cesarean delivery in all cases for the correct diagnosis. Hysterectomy was defined as subtotal or total excision of the uterus.

Conservative treatment was defined as uterine preservation as follows:

1. uterine devascularization procedure involving low bilateral uterine artery ligation with bilateral utero-ovarian ligament ligation;
2. primary suturing by oversewing the placental bed after removal of the placenta until hemostasis was achieved with surgical primary sutures;
3. bilateral internal iliac artery ligation (BIIAL), at approximately 4 cm distal to the level of the common iliac artery bifurcation; and
4. the placenta left entirely within the uterus.

Three patients that were transferred to our hospital after cesarean delivery and two cases with incomplete data were excluded from the analysis.

The following relevant data were recorded: maternal age, parity, gestational age, previous cesarean deliveries, and presence of placenta previa.

The medical records were also used to detect the type of surgical intervention, intensive care unit admission, length of hospital stay, estimated amount of blood loss, and the need for transfusion of packed red cells.

Maternal complications were also evaluated, including cystotomy, coagulopathy (platelets of  $\leq 100\ 000/\mu\text{L}$ , international

normalized ratio of  $\geq 1.2$ , and/or fibrinogen of  $\leq 200$ mg/dL), occurrence of intra-abdominal infection, and hospital re-admission within 6 weeks.

The study protocol was approved by the Medical Ethics Committee of Dicle University.

Data were presented as mean $\pm$ standard deviation and/or median (minimum-maximum) values. Distribution pattern of numerical data was assessed by Kolmogorov-Smirnov test. Differences between the two groups were tested by Student's t test for normally distributed data and by Mann-Whitney U test for skewed data. P value of less than 0.05 was accepted as statistically significant.

## Results

During the study period, 29 placenta accreta cases were found and 12 356 deliveries occurred in Center A, and 12 placenta accreta among 90 879 deliveries in Center B. The incidence of placenta accreta was 1/426.1 deliveries in Center A and 1/7573.3 deliveries in Center B over a 5-year period. The demographic and clinical characteristics of the 41 pregnancies complicated with placenta accreta are shown in Table I.

Thirty-nine (95.1%) patients had placenta previa, and 32 (78.0%) had at least one previous cesarean delivery. Demographics and clinical parameters with respect to history of cesarean delivery are presented in Table 2. Maternal age was found to be higher in patients without the history of cesarean delivery (n = 9) when compared with patients who had had previous cesarean

delivery (n = 32). There were no significant differences in parity, gestational age, amount of blood transfusions, estimated blood loss, and postoperative hospital stay days between women with and without history of cesarean delivery ( $p > 0.05$ ), (Table II).

All patients had identifiable risk factors for placenta accreta. Delivery was carried out by cesarean section in all pregnant women. Fourteen (34.1%) patients underwent elective surgery, whereas 27 (65.9%) of them underwent emergency cesarean delivery because of preterm labor and/or the presence of excessive vaginal bleeding. Hysterectomy was performed in 28 (68.3%) out of 41 women with placenta accreta that were included in the analysis, and conservative treatment was performed in 13 (31.7%) cases. Uterine-preserving procedures included oversewing of the placental bed (n = 8), uterine devascularization (n = 2), BIIAL (n = 1), ligation of the utero-ovarian ligament plus BIIAL (n = 1), and whole placenta left in the uterus (n = 1). Internal iliac artery ligation was performed in 8 (19.5%) patients (in 2 patients without hysterectomy and in 6 with hysterectomy in order to control the hemorrhage). Bladder repairs for cystotomy occurred in 6 (14.6%) patients. Twelve (29.3%) women required maternal intensive care unit admission including coagulopathy in 9, intraoperative shock in 2, and respiratory distress plus acute renal failure in 1. Infectious complications occurred in 7 (17.1%) patients. Hospital readmission was required in case of 4 patients (9.8%): 1 because of wound dehiscence and 3 due to intra-abdominal infection. One (2.4%) maternal death occurred because of excessive bleeding at Center B.

**Table I.** Maternal characteristics and morbidity of women with placenta accreta.

Characteristics	Mean $\pm$ SD	Median (minimum-maximum)
Age, years	33.2 $\pm$ 4.9	33 (22-44)
Parity, n	3.9 $\pm$ 2.2	4 (0-9)
Gestational age, weeks	35.2 $\pm$ 3.3	36 (24-40)
Prior cesarean sectio, n	1.5 $\pm$ 1.2	1 (0-4)
Estimated blood loss, liters	2.43 $\pm$ 1.2	2 (1-6)
Postoperative length of stay, days	7.3 $\pm$ 4.7*	6 (3-26) *
Blood transfusion, units	3.5 $\pm$ 2.5	3 (1-14)

SD = Standard deviation, \*A patient who died intraoperatively excluded.

**Table II.** Demographics and clinical parameters of patients according to history of cesarean delivery.

	Previous cesarean delivery (n=32)	No cesarean delivery (n=9)	p
Age, years	32.3 $\pm$ 4.7	36.2 $\pm$ 5.0	<b>0.037</b>
Parity, n	3.5 $\pm$ 1.9	5.3 $\pm$ 3.0	0.052
Gestational age, weeks	35.1 $\pm$ 3.5	35.3 $\pm$ 2.7	0.949
Blood transfusion, units	3.8 $\pm$ 2.7	2.4 $\pm$ 1.7	0.134
Estimated blood loss, liters	2.56 $\pm$ 1.29	1.94 $\pm$ 0.64	0.311
Postoperative hospital stay, days	7.6 $\pm$ 5.0	5.4 $\pm$ 3.5	0.123

Data are presented as mean $\pm$ standard deviation.

## Discussion

The incidence of placenta accreta was 1/426 deliveries in Center A and 1/7573 in Center B over the 5-year period. In the literature, the incidence of placenta accreta varies widely, from 1 in 540 to 1 in 93 000, depending on differences in clinical or histological definitions, variations between study groups, and different decades of these studies [3]. Compared with the literature, the incidence of placenta accreta in Center A was higher; this was related to the fact that Center A is a tertiary University Hospital where antenatally diagnosed or suspected placenta accreta cases are referred to from other hospitals in the region.

Miller et al [6] reported the following incidences of abnormal placentation: placenta accreta – 75.8%; placenta increta – 17.7%; and placenta percreta – 6.5%. The association between placenta accreta and placenta previa is well recognized, and the incidence of both is increasing in association with the rising rate of cesarean delivery. In women with placenta previa and at least one previous cesarean section, the risk of placenta accreta was especially affected by the location of the placenta with respect to the uterine scar. Placenta accreta occurred in 29% of cases in which the placenta was anteriorly or centrally implanted overlying the uterine scar and in 6.5% of cases in which it was not. Women who had had two or more cesarean deliveries with anterior or central placenta previa had nearly a 35% increased risk of developing placenta accreta [6]. In the present study, 32 (78.0%) of patients had a history of cesarean delivery, and 39 (95.1%) had a history of placenta previa. Increasing parity, advanced maternal age, and prior uterine curettage are other risk factors for placenta accreta [2, 3].

Morbidity from placenta accreta is caused by problems associated with massive bleeding. In the present study, all patients required blood product transfusion, and the mean estimated blood loss was >2 L. The incidences of coagulopathy requiring admission to the intensive care units and infectious complications are also high in placenta accreta patients, as reported in previous studies. Surgical complications such as cystotomy, ureteral injury, or the need for a second operation to control hemorrhage could be related to placenta accreta [7-9].

Maternal death has been reported in up to 7% of cases [10]. Because of the high morbidity and mortality associated with placenta accreta, a multidisciplinary approach is recommended. Outcomes could be improved with an antenatal diagnosis and specialized care. Much consideration should be given to the management of massive hemorrhage, including the availability of packed cells, platelets, fresh frozen plasma, cryoprecipitate, and whole blood.

Hysterectomy has traditionally been advised in the management of placenta accreta [11], but there has been a recent tendency toward conservative management for the preservation of fertility. Strategies include BIIAL, surgical uterine devascularization, resection of the placental implantation site, uterine repair, leaving the placenta in place after caesarean delivery with medical treatment, embolization of the uterine vessels, uterine compression sutures, and/or oversewing of the placental vascular bed [12-17]. In some cases, hysterectomy may still fail to control the hemorrhage and in these cases BIIAL may be added to the surgical procedure [8].

Although data on fertility and pregnancy outcomes after conservative treatment for placenta accreta are limited, a few

studies have suggested that this procedure did not appear to have affected fertility or subsequent obstetrical outcomes [17].

This retrospective study had some limitations. The sample size was insufficient to identify differences in complications with the use of different management strategies, fertility expectations in relation to the type of conservative surgery of selected patients, depth of placental invasion, surface width, and severity of bleeding. Control of bleeding differed in every patient, management decisions were made at the discretion of the responsible clinician, and standardized protocols were not employed.

In conclusion, placenta accreta is highly associated with the existence of placenta previa, especially in cases with previous cesarean delivery. When placenta accreta is diagnosed or suspected antenatally, the patient must be referred to a tertiary center in which the obstetrical team, comprised of experienced pelvic surgeons, is capable of carrying out emergency hysterectomy, internal iliac or uterine artery ligation, or uterine devascularization procedures, as well as dealing with possible urinary tract injuries.

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