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Evaluation of conservative and radical surgical outcomes in placenta previa and accreta cases

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Abstract

Objective: To evaluate our 5-year clinical experience in the management of cases with placenta previa together with placental attachment anomalies and the activity of the hypogastric artery ligation (HAL) for the protection of uterus.

Methods: The cases who had cesarean section and were established the diagnosis of placenta previa and accreta between 2009 and 2014 in the Department of Obstetrics and Gynecology, Faculty of Medicine, Mustafa Kemal University were evaluated retrospectively. The medical files of the patients were analyzed and their demographic characteristics, and surgical and conservative approaches were evaluated. Hysterectomy rates after cesarean section of the patients who did and did not undergo hypogastric artery ligation were compared.

Results: In the evaluation of 67 placenta previa cases included in the study, 32 patients were applied post-cesarean hysterectomy, 40 patients were applied HAL, 12 patients were applied uterine sutures and 3 patients were applied Foley catheter. All of the patients who were applied uterine suture and Foley catheter were in the non-hysterectomy group. It was found that 27 (67.5%) of 40 patients who had HAL were applied post-cesarean hysterectomy and 5 of 27 patients who did not have HAL were applied post-cesarean hysterectomy, and there was statistically a significant difference between groups (p=0.001). In the pathology results of the patients who had hysterectomy, it was reported that 8 (25%) patients did not have accreta, 11 (34.4%) patients did not have increta, 10 (31.3%) patients did not have percreta and 3 (9.4%) patients did not have placental invasion. In terms of complications, it was found that 9 cases had bladder injury, one case had vaginal cuff hematoma and one case had disseminated intravascular coagulopathy. In neonatal outcomes, mean delivery week was 35.2±5.7, birth weight was 2674 g, 1-minute and 5-minute Apgar scores were 6.7 and 7.8, respectively. Fetal anomalies were observed in two newborns.

Conclusion: In cases with placenta previa in company with placental attachment anomaly, conservative surgical approach can be an alternative method. However, organ protection activity of HAL in such cases is considered to be suspicious.

Keywords: Placenta previa, hypogastric artery ligation, placental attachment anomaly.

Özet: Plasenta previa ve akreta olgularında konservatif ve radikal cerrahi sonuçlarının değerlendirilmesi

Amaç: Plasenta previa ve beraberinde plasenta yapışma anomalisi olan olguların yönetiminde 5 yıllık klinik deneyimimizi ve bu hastalarda hipogastrik arter ligasyonunun (HAL) uterusun korunmasındaki etkinliğini değerlendirmektir.

Yöntem: Mustafa Kemal Üniversitesi Tıp Fakültesi Kadın Hastalıkları ve Doğum Anabilim Dalı Kliniğinde 2009 ile 2014 yılları arasında sezaryen uygulanan plasenta previa ve plasenta akreta tanısı konulan olgular retrospektif olarak değerlendirmeye alındı. Hastaların, dosya kayıtları incelenerek demografik özellikleri, cerrahi ve konservatif yaklaşımlar değerlendirildi. Hipogastrik arter ligasyonu yapılan ve yapılmayan grupların sezaryen sonrası histerektomi oranları karşılaştırıldı.

Bulgular: Çalışmaya alınan 67 plasenta previa olgusunun değerlendirilmesinde, 32 hastaya sezaryen sonrası histerektomi, 40 hastaya HAL, 12 hastaya uterin sütürler ve 3 hastaya Foley sonda uygulandı. Uterin sütür ve Foley sonda uygulanan hastaların tamamı histerektomi yapılmayan grupta yer almaktaydı. HAL yapılan 40 hastanın 27'sine (%67.5) takiben sezaryen sonrası histerektomi yapıldığı, HAL yapılmayan 27 hastanın ise beşinde sezaryen sonrası histerektomi yapıldığı ve gruplar arasında istatistiksel olarak anlamlı fark olduğu izlendi (p=0.001). Histerektomi yapılan hastaların patoloji sonuçları; 8 (%25) hastada akreta, 11 (%34.4) hastada inkreta, 10 (%31.3) hastada perkreta ve 3 (%9.4) hastada plasental invazyon olmadığı şeklinde rapor edildi. Komplikasyonlar yönünden incelendiğinde; 9 olguda mesane yaralanması, bir olguda vajinal kaf hematomu ve bir olguda dissemine intravasküler koagülopati geliştiği saptandı. Neonatal sonuçlarda ortalama doğum haftası 35.2±5.7, doğum ağırlığı 2674 gram, 1. ve 5. dakika Apgar skorları sırasıyla 6.7/ 7.8 izlendi. İki yenidoğanda fetal anomali gözlendi.

Sonuç: Plasenta previa ve beraberinde plasenta yapışma anomalisi olan seçilmiş olgularda konservatif cerrahi yaklaşım alternatif yöntem olabilir. Ancak HAL'ın bu hastalarda organ koruyucu etkinliği şüpheli görünmektedir.

Anahtar sözcükler: Plasenta previa, hipogastrik arter ligasyonu, plasenta yapışma anomalisi.

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Introduction

Placenta previa (PP) is defined as placental tissues being near or over internal cervical os. This condition with severe hemorrhage and early delivery potential has an incidence rate of 3.5–4.6 per 1000 deliveries. While its prevalence is reported more frequently in the early weeks of gestation, most of the cases recover spontaneously in the advanced weeks.[1] However, a dramatic increase has been observed recently in the incidence of placenta previa together with increased cesarean rates.[2] Although antenatal diagnoses have been improved by ultrasonography and magnetic resonance imaging (MRI), placenta previa and especially concomitant placental attachment anomalies may cause postpartum massive hemorrhage.[3,4] In patients with placenta accreta, an increase also in fetal mortality, disseminated intravascular coagulopathy (DIC) and infection can be observed. Standard approach in such patients is to carry out hysterectomy.[5] However, the information is limited for the most appropriate management in patients who especially request fertility. Uterine compression sutures and hypogastric artery ligation (HAL) or embolization appear as organ protection approaches in such patients.[6,7]

In this study, we aimed to evaluate the conservative and radical surgical approaches applied in our clinic, their outcomes and HAL's activity in protecting uterus for patients who have placenta previa together with placental attachment anomaly.

Methods

The medical files of the cases who had cesarean section and were established the diagnosis of placenta previa and accreta in the Faculty of Medicine of Mustafa Kemal University between January 2009 and December 2014 were evaluated retrospectively. Cases with marginal and low-lying placenta previa were excluded from the study. Ages, gravida, parity, week of gestation, number of cesarean undergone, newborn weight, 1-minute and 5-minute Apgar scores and fetal anomalies (if any) of the patients were recorded. In addition, operation duration, transfusion need, hospitalization period, intense care need, operative complications, preoperative and postoperative hemogram and hematocrit values were also recorded. From the surgery notes of the patients, the incision type, whether they had HAL or not, uterine saturation, placing intraoperative Foley catheter to uterine lower segment and cervix, and post-cesarean hysterectomy condition were noted. The pathology reports of the patients who had post-cesarean hysterectomy were also reviewed.

Statistics

All statistical analyses of the data were done by using SPSS software, version 22.0 (SPSS, Inc., Chicago, IL, USA). In the evaluation of the data, mean±standard deviation was used. Availability of normal distribution in continuous variables was evaluated by Kolmogorov-Smirnov test. Descriptive statistics were analyzed via demographic characteristics. Paired samples t-test was used for the comparison of hemogram values while chi square test was used for the comparison of percentage values. p value below 0.05 was considered as statistically significant.

Results

Among 2276 pregnant women who delivered in the last 5 years, 8 of 81 patients with placenta previa were excluded from the study since they had marginal or low lying placenta previa. Six patients were also excluded from the study due to the missing information in their medical files. As a result, 67 (29/1000) cases were included in the study. The demographic characteristics of the patients are shown in the **Table 1**. Except four

Table 1. Demographic, clinical and biochemical characteristics of the patients.

Parameter	Mean*	Min.	Max.
Age	31.27±5.73	17	44
Gravida	3.78±1.42	1	8
Parity	2.1±0.99	0	4
Week of gestation	35.2±3.63	22	39
Number of cesarean section	1.9±0.97	0	4
Birth weight (g)	2674±807	580	4580
1-minute Apgar score	6.7±2.4	0	9
5-minute Apgar score	7.8±2.5	0	10
Erythrocyte (unit)	2.63±3.98	0	28
Operation duration (minute)	95±48	45	300
Hospitalization period (day)	4.9±4.3	1	30
Preoperative Hb (g/dl)	10.6±1.7	6.9	14.7
Preoperative Htc (%)	31.87±4.8	22.3	43.8
Postoperative Hb (g/dl)†	9.8±1.4	6.9	13.8
Postoperative Htc (%)‡	29.44±4.5	21.8	43.8

*Mean variables and their standard deviations were provided.

†Postoperative hemoglobin value was found to be statistically and significantly lower than the preoperative value (p=0.001).

‡Postoperative hematocrit value was found to be statistically and significantly lower than the preoperative value (p=0.001).

patients, it was reported that all patients had cesarean history. A significant decrease was observed in the hemogram and hematocrit values of patients (p=0.001 and p=0.001, respectively). Pfannenstiel incision was applied in 53 (79%) patients while median hypogastric incision was applied in 14 (21%) patients. Twenty-two patients were applied post-cesarean hysterectomy, 40 patients were applied HAL, 12 patients were applied uterine sutures on placental implantation region and 3 patients were applied Foley catheter (**Table 2**). All of the patients who were applied uterine suture and Foley catheter were in the non-hysterectomy group. It was found that 27 (67.5%) of 40 patients who had HAL were applied post-cesarean hysterectomy and 5 of 27 patients who did not have HAL were applied post-cesarean hysterectomy, and there was statistically a significant difference between groups (p=0.001) (**Fig. 1**). It was found by the pathology results of the patients who had hysterectomy that 8 (25%) patients did not have accreta, 11 (34.4%) patients did not have increta, 10 (31.3%) patients did not have percreta and 3 (9.4%) patients did not have placental invasion. Fifty-one (76.1%) patients needed blood transfusion. Averagely, 2.63 units of erythrocyte suspension were administered. Also, 39 (58.2%) patients needed intense care. In terms of complications, 9 patients had bladder injury, 1 patient had vaginal cuff hematoma and 1 patient developed DIC. In the follow-up period of the patient who had DIC, the patient developed multi-organ failure and died on postpartum 30th day. In neonatal results, major anomaly was found in two newborns, one being multiple anomaly and other being hydrocephaly.

Table 2. Conservative and radical surgical methods applied together with cesarean section.

Method	Done	N/A
Hypogastric artery ligation	40 (%59.7)	27 (%40.3)
Postpartum hysterectomy	32 (%47.8)	35 (%52.2)
Uterine suture	12 (%17.9)	55 (%82.1)
Foley catheter	3 (%4)	64 (%96)

Discussion

Together with the increase of previous cesarean rates recently, placenta previa cases have been observed more frequently.[2] Indeed, we found placenta previa in 29 of 1000 deliveries in our study. It is seen that our rate is 7–8 times higher than the values 3.5–4.6 per 1000 deliveries reported in the literature.[1] In terms of the demographic characteristics, our cases were in their 30s, their mean parity was two and almost all had previous cesarean history. Previous cesarean history and multiparity are also major risk factors for placenta previa in our study.[8–10] It is also observed that Pfannenstiel incision is preferred more, operation durations reach 1.5 hour, patients are hospitalized about 5 days and more than half of them require intense care. It is seen that hemogram values decreased significantly after surgery and the patients were administered approximately 2.6 units of erythrocyte suspension.

Together with placenta previa, various rates of placental attachment anomalies were reported. Placental attachment anomaly was reported as 11–25% when there was single cesarean section history together with placental previa, 35–47% when there were two previous cesarean sections and about 40% when there were above three previous cesarean sections.[11–13] In our study, we found attachment anomaly confirmed by histologically in about 43% among all the patients with placenta previa. It was seen that our patients had averagely 2–3 previous cesarean sections. Accreta was reported in 8 patients, increta in 11 patients and percreta in 10 patients. In the study of Sumigama et al.,[14] there were 18 placenta increta and 5 placenta percreta

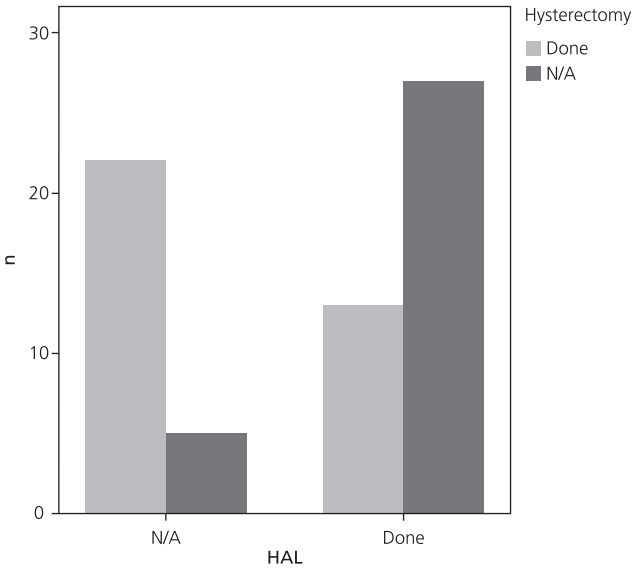

Fig. 1. Postpartum hysterectomy distribution in patients who did and did not undergo hypogastric artery ligation (**HAL**).

cases in 408 patients with previa. In the study of Grace Tan et al.,[15] 12 of 27 patients were reported to have placenta accreta, one to have placenta increta and 14 to have placenta percreta. It can be considered from the lower rate of placenta accreta in pathological reports that uterus could be protected much in these patients.

Placenta previa increases the risks for antepartum (RR=9.8), intrapartum (RR=2.5) and postpartum hemorrhage (RR=1.9).[1] Therefore, the need for blood transfusion in pregnant women with PP increased compared to those without PP (12% vs. 0.8%).[16] In our study, the need for blood transfusion was 76%. In order to control the hemorrhage, HAL was used the most among surgical procedures; however, post-cesarean hysterectomy was applied at a significant rate in these cases (**Fig. 1**). This has made us to consider that the intractable hemorrhage seen in PP and/or placental attachment anomalies were not got under control sufficiently by HAL, and therefore hysterectomy would be required in these patients. HAL was first applied to stop refractory hemorrhage seen in cervix cancer.[17] Although rational pelvic blood flow in HAL was decreased about 50% and arterial pressure was dropped in gynecologic and obstetric hemorrhages, blood flow rate decreases since venous pressure is kept stable.[18] The branches from external iliac artery to paravesical and vaginal areas after HAL can explain the failure of HAL in placental attachment anomalies. In some cases, massive blood flow was observed from external iliac artery to anastomosis lines, and even anastomoses with inferior epigastric and inferior mesenteric arteries contributed blood build up of uterus again through uterine artery.[19] It was also shown that the artery was recanalized after HAL, and blood flow in uterine, arcuate and ovarian arteries was sustained.[20,21] In the study of Iwata et al.,[19] the groups which did and did not have HAL were compared in the patients who had cesarean hysterectomy due to placenta accreta, and no difference was found between the groups in terms of hemostasis. It was emphasized in another study that HAL did not decrease morbidity in placenta accreta, expected blood loss or blood transfusion need, and that HAL was not required in the prophylactic routine practice in placenta accreta.[22] There are some studies with small populations suggesting prophylactic hypogastric artery embolization in patients suspected for placenta accreta.[23,24] In this study, HAL was applied before hysterectomy in all patients who had both HAL and hysterectomy.

In our study, among other surgical methods, square-shaped sutures were applied to uterus in 12 patients and Foley catheter was applied in 3 patients. Cho et al.[25] reported that applying square and circular sutures over uterus serosa on placental implantation localization contributed to hemorrhage control. In this study, all of the patients, who had saturation and applied Foley catheter even in a low rate, being in the non-hysterectomy group may be considered that these methods could be preferred first for hemorrhage on implantation region.

Mortality rates up to 7% were reported depending on the complications observed together with placenta previa such as ureter damage, infection and fistula formation in addition to intraoperative and postoperative massive blood loss and transfusion in placenta accreta.[26] In this study, a patient who developed DIC and sepsis after massive hemorrhage and transfusion died on postoperative 30th day. Sumigama et al.[14] reported in their study that one patient with placenta previa died due to massive hemorrhage. In our study, the most severe complication was bladder injury and found in 9 patients. Bladder injury in placenta previa was reported as 1/10,000 in the literature and it was stated that multidisciplinary approach might be required in such patients.[27]

Our neonatal results show mean week as 35, weight as 2600 g and almost normal Apgar scores. Similarly, O'Brien et al.[26] indicated in their study that the patients suspected for placenta accreta had post-hemorrhage delivery need after 35th week at a rate of 93% and 4 out of 8 maternal death were in labors delayed after 36th week. American College of Obstetricians and Gynecologists (ACOG) recommends planning preterm cesarean hysterectomy after 34 weeks of gestation in cases suspected for placenta accreta. Although we observed major anomaly in two fetuses in our study, it was also reported in the literature that placenta previa decreases Apgar score but it is not associated with congenital anomaly and fetal death.[28]

Conclusion

In cases with placenta previa in company with placental attachment anomaly, conservative surgical approach can be an alternative method. However, organ protection activity of HAL in such cases is considered to be suspicious.

Conflicts of Interest: No conflicts declared.

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