Research Article

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On the Issue of Optimizing Surgical Tactics and Blood-Saving Techniques in Case of Placenta Ingrowth into the Uterine Scar

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AIM OF STUDY The study of the results of delivery of pregnant women with placenta ingrowth in the uterine scar depending on the clinical status and the methods of blood saving.

MATERIAL AND METHODS The design of a selective retrospective study included 54 pregnant women with central placenta previa and uterine scar after caesarean section (CS), with histologically confirmed results of placenta accreta. Among blood-saving methods we used: ligation of three pairs of main vessels of the uterus, ligation of the internal iliac arteries, complex compression hemostasis according to R.G. Shmakov, temporary clamping of the common iliac arteries.

RESULTS CS with fundal incision was performed in 47 women (87.0%) out of 54. Hysterectomy was performed in 17 women (31.5%) out of 54. In the remaining 37 cases (68.5%), metroplasty and organ preservation were performed. There was no relaparotomy; there was no maternal mortality; perinatal mortality was 4 (7.4%); forced opening, bladder resection were performed in 7 (13.0%) cases; opening of the bladder without wall resection — in 2 (3.7%); 2 near miss cases; there were no complications associated with temporary clamping of the common iliac arteries; endometritis (recovery after conservative treatment) was revealed in 2 women (3.7%). Histologic examination results: 15 (27.8%) of placenta accreta, 30 (55.6%) of placenta increta, 8 (14.8%) of placenta percreta. In 8 cases, there was a combination of placenta increta into the uterine scar region of different depths, and in 2 (3.7%) cases, a combined deeply invasive lesion of the posterior wall of the lower segment and the body of the uterus.

CONCLUSION Complex compression hemostasis according to R.G. Shmakov is the most rational and promising method of blood saving, acceptable among the majority of patients with placenta accreta spectrum. Temporary clamping of the common iliac arteries is advisable in case of damage to the posterior wall of the bladder. Preservation of the uterus: in case of a deeply invasive lesion, including cases of combined damage to the posterior wall of the lower segment of the uterus or the body of the uterus, significant blood loss before the woman enters the hospital, it is not an imperative of surgical tactics.

Keywords: placenta accreta, central placenta previa, uterine scar

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TCCIA - temporary clamping of common iliac arteries
PA - placenta accreta
PAUS - placenta accreta in the uterine scar
CCH - complex compression hemostasis
CS - caesarean section
MRI - magnetic resonance therapy
LUS - lower uterine segment
PP - placenta previa
US - uterine scar
TCPC - Tashkent City Perinatal Center
PAS - placenta accreta spectrum

In his classic publication on operative obstetrics in 1974, Mikhail Sergeyevich Malinovsky pointed out: “True placenta accreta is a very rare phenomenon.” However, from the mid-twentieth century to the present, cases of placenta adherent (PA) into the uterine scar (US) (PAUS) have increased 50–60-fold: 1:25,000–50,000 births to 1:500–1000 today, and 1:343 specialized centers [1, 2]. According to FIGO (2018), there is strong epidemiological

evidence that PA has essentially become an iatrogenic condition as a result of the significant increase in caesarean section (CS) rates worldwide. The high risks of massive blood loss and maternal mortality have made this problem a priority in modern obstetrics, and the optimization of blood-saving technologies has become its most important aspect. Considering the heterogeneous composition of patients with placenta accreta spectrum (PAS), optimization of surgical tactics implies: a rational balance between the nature of surgical trauma, the effectiveness and safety of the intervention relative to the actual pathology in each specific case. In addition, economic and organizational costs are very important in evaluating approaches. In this regard, we tried to summarize some of the results of our activities after our institution began to accumulate patients with PAS since February 2018. This study is essentially the first work characterizing the problem of PAUS in the Republic of Uzbekistan.

Aim of the study: to reduce intraoperative blood loss, increase organ preservation rates among patients with PAUS after CS.

MATERIALS AND METHODS, STUDY DESIGN

The criterion for inclusion in the study was the presence of central placenta previa (PP) and signs of PA according to ultrasound and magnetic resonance imaging (MRI) in a patient with US after CS. The development of a selective retrospective study included 54 pregnant women (more than 22 weeks), with the presence of 1 or more scars on the uterus after CS, who were admitted to the Tashkent City Perinatal Center (TCPC) in the period 2018–2020.

CLINICAL CHARACTERISTICS OF THE MATERIAL

The age of the patients ranged from 21 to 41 years, the average was 31.9±3.6 years, most often in the range of 26–32 years. The average number of pregnancies in history was 3.9±1.3. There were 15 women (27.8%) with one US, 28 (51.8%) with 2, 7 (12.9%) with 3, and 4 (7.4%) with 4. Twins were observed in 2 cases (3.7%). There was a history of spontaneous birth (before CS) in 6 women (11.1%). There was no history of induced abortions; there were 8 (14.8%) missed abortions at gestational ages from 5 to 14 weeks. The gestational age when surgical delivery was performed ranged from 24 to 39 weeks: 24–30 weeks in 7 (13.0%), 31–34 weeks in 17 (31.5%), 35–37 weeks in 24 (44.4%), 38–39 weeks in 6 cases (11.1%). All pregnant women were admitted without regular labor activities.

Complications of pregnancy upon admission: mild preeclampsia was found in 9 cases (16.7%), severe preeclampsia was revealed in 4 cases (7.4%); progressive placental abruption in 9 cases (16.7%), the presence of old retroplacental hematomas (according to ultrasound results) ranging from 26.0x18.0 mm to 80.0x34.0 mm was noted in 29 cases (53.7%); antenatal fetal death at 31 weeks was observed in 1 case (1.9%); the threat of miscarriage at various stages of pregnancy with bleeding before admission was noted in 27 women (50.0%). A significant composition of extragenital pathology was presented: diabetes mellitus in 3 cases (5.6%); cardiac arrhythmias in 2 cases (3.7%); chronic arterial hypertension in 4 cases (7.4%); varicose veins (including the vulva area) in 12 cases (22.2%); chronic hepatitis (B and C) in 3 cases (5.6%); asymptomatic bacteriuria in 3 cases (5.6%).

Prenatally in the antenatal clinic, the primary diagnosis of PAS was established in 38 women (70.4%) out of 54 at gestational age of 16 to 27 weeks of pregnancy. In the remaining 16 women (29.6%), the diagnosis was established upon urgent admission to the hospital: in 10 (18.5%) in the emergency department, and in 6 (11.1%) cases it was established intraoperatively. The diagnosis of the central PP, invasion into the US was established on the basis of ultrasound (Doppler study). The criteria for diagnosis were placental lacunae, hypertrophied large-caliber vessels in the US, disappearance of the hypoechoic zone between the placenta and the myometrium of the lower uterine segment (LUS), disappearance of the obvious border between the bladder and the uterine wall. The MRI study was performed in 21 patients (38.9%) out of 54. In all cases, signs of PA were detected.

So, 34 patients (63.0%) were operated on as planned, 20 women (37.0%) were operated urgently. The basis for emergency intervention in all cases was progressive placental abruption. At 24–30 weeks, 7 women (13.0%) out of 54 were operated on, all were emergencies; in the period of 31–34 weeks 17 women (31.5%) were operated, of which 9 (16.7%) cases were planned and 8 cases were emergencies (14.8%); at 35–37 weeks 23 surgeries (42.6%) were planned and 1 (1.9%) was emergency; at 38–39 weeks 2 (3.7%) cases were planned and 4 (7.4%) were emergencies. As one can see, the majority of planned operations were performed at 31–37 weeks, and emergency operations at 24–30 weeks and 38–39 weeks, although the difference is not significant.

During the operation, the following blood-saving surgical methods were used: complex compression hemostasis according to R.G. Shmakov in 30 women (55.6%). The method consists of applying compressive "nooses" on ovarian vessels, infundibulopelvic ligaments and the proximal parts of the cervix after fetal extraction, before metroplasty [3]. We put soft Satinsky clamps to the infundibulopelvic ligaments, and, as is traditional, Foley catheters to the cervix, through the apertures made in the wide uterine ligaments. Intraoperative direct temporary clamping of the common iliac arteries (TCCA) was used in 11 women (20.4%). The access to the vessels was performed in a regular was by opening the dorsal parietal peritoneum, rubber tourniquets were used for the common iliac arteries, they were pulled up before clamping, and one De Bakey clamp was put at a distance of 2 cm from the aortic bifurcation. Temporary clamping of the abdominal aorta was performed in 1 case (1.9%). The balloon occlusion of the iliac arteries was not used due to the lack of technological equipment. The resection of altered areas of the anterior wall of the urinary tract (metroplasty) together with the placenta was carried out for the purpose of organ preservation. The final decision regarding the surgical plan and the use of one or another blood-saving aid was made intraoperatively. The selection criteria were macroscopic markers of the depth and extent of PA, signs predicting technical difficulties in performing the operation and a large volume of blood loss: the degree and area of vascular hypertrophy in the area of the anterior wall of the urinary tract, the degree of thinning of the anterior wall of the urinary tract and the severity of the uterine hernia, the nature of the adhesive process between the bladder and LUS.

The removed material: the resected sections of the LUS, the placenta, the uterus after hysterectomy were sent for histological examination. In all 54 cases, photo and video documentation of the main stages of the operation was carried out.

RESEARCH RESULTS

The statistical data on obstetrics in Tashkent for 2018–2020 show, that against the background of an increase in the number of live births (44,838 in 2018, 49,906 in 2019 and 47,028 in 2020), there is an increase in the frequency of CS: 27.0% in 2018, 28.1% in 2019 and 30.6% in 2020. The hysterectomy rate remained stable during these years at 0.2% (283 of 141,772 births over 22 weeks).

In the above-mentioned years, 110 women (0.7%) with PP (all forms) out of 16,881 admitted during pregnancy of more than 22 weeks were operated on at TSPC. At the same time, 17 women (0.1%) were operated on without US, 93 (0.6%) with US, and 54 (0.3%) with central PP and US. As one can see, the frequency of PP in the population of women with US was significantly higher than that among patients without US, on average 6 times. It is necessary to note that in the structure of hysterectomy, the PAS indicator, which began to appear in the statistical reports of the TSPC since 2018, increased sharply against the background of a five-fold decrease in the rate of uterine hypotension (Table 1). Currently, it is the leading indication for obstetric hysterectomy in the TCPC, accounting for more than half of all hysterectomies.

Table 1

The structure of hysterectomy in the Tashkent city perinatal center

Studied indicators, n (%)	Years, number of caesarean sections			Total (n=6,314)
	2018 (n=1,968)	2019 (n=2,072)	2020 (n=2,274)	
Total hysterectomies	9 (0.5)	15 (0.7)	9 (0.4)	33 (0.5)
– hypotension	5 (55.6)	3 (20.0)	1 (11.1)	9 (27.3)
– uterine fibroids	–	2 (13.3)	2 (22.2)	4 (12.1)
– infection	1 (11.1)	2 (13.3)	–	3 (9.1)
– Placenta accreta spectrum	3 (33.3)	8 (53.3)	6 (66.7)	17 (51.5)

The blood loss is the cornerstone in assessing the results of operative delivery in pregnant women with PAS. The table 2 shows the levels of blood loss depending on some clinical and morphological parameters. As one can see, out of 39 women with blood loss up to 1500 ml, 24 (61.5%) had 2 or more US, and with blood loss from 1,500 to 3,500 ml, all 15 women had this status. The second important feature emerging from this table is the influence of

the method of CS on the level of blood loss. As you can see, fundal CS was not accompanied by blood loss of more than 2,000 ml in any case, while out of 7 women, among whom CS was performed with a transverse incision along the upper edge of the placenta previa, 6 had blood loss in the range of 2,000–3,500 ml. These patients included 2 women with ˝near miss˝ status. Both experienced cardiac arrest during the operation as a result of large blood loss for several minutes. Rapid successful resuscitation allowed the women to be saved and discharged from the TCPC along with their infants [4]. It is also necessary to pay attention to the fact that out of 7 women in this group, 6 (including 2 with ˝near miss˝) had to undergo hysterectomy (Table 2). Only in 1 case out of 7 was there was blood loss not higher than 1.0 L. This patient did not have a deeply invasive lesion of the myometrium, there was no failure of the US and she didn't require metroplasty. Therefore, we associate the small level of blood loss in this case with the relatively mild morphologic lesion.

Table 2

Blood loss as a result of operative delivery among patients with central placenta previa and uterine scar depending on some clinical and morphological parameters

Indicators	Blood loss, ml				Total women (n=54), n (%)
	500–1,000 (n=20), n (%)	1,001–1,500 (n=19), n (%)	1,501–2,000 (n=8), n (%)	2,001–3,500 (n=7), n (%)	
Number of scars on the uterus (US): 1 2 3 4	 8 (40.0) 12 (60.0) – –	 7 (36.8) 8 (42.1) 4 (21.1) –	 – 5 (62.5) 1 (12.5) 2 (12.5)	 – 3 (42.8) 2 (28.6) 2 (28.6)	 15 (27.8) 28 (51.8) 7 (12.9) 4 (7.4)
Fundal CS, without metroplasty, organ preservation	1	–	–	–	1 (1.8)
Fundal CS, metroplasty, organ preservation	17 (85.0)	16 (84.2)	2 (25.0)	–	35 (64.8)
Fundal CS, metroplasty, hysterectomy	–	1 (6.3)	1 (12.5)	–	2 (3.7)
Fundal CS, hysterectomy	2 (10.0)	2 (12.5)	5 (62.5)	–	9 (16.7)
CS along the upper edge of the placenta in the LUS (n = 7), including 2 women with ˝near miss˝ status. – Organ preservation – Hysterectomy	 1 (14.2) –	 – –	 – –	 – 6 (85.7)	 1 (14.2) 6 (11.1)
Depth of placenta accreta: – Placenta accreta – Placenta increta – Placenta percreta	 12 (60.0) 6 (30.0) 2 (10.0)	 2 (12.5) 10 (52.6) 7 (36.8)	 – 5 (62.5) 3 (37.5)	 – 4 (57.1) 3 (42.9)	 14 (25.9) 25 (46.3) 15 (27.8)
Ingrowth into the bladder, resection of the posterior wall of the bladder (n = 7)	1 (5.0)	1 (6.3)	2 (25.0)	3 (42.8)	7 (12.9)
Ingrowth into the posterior wall of the urinary tract and the body of the uterus (n = 2). Hysterectomy in both cases	–	–	1 (12.7)	1 (14.3)	2 (3.7)

Notes: CS - cesarean section, US - uterine scar, LUS - lower uterine segment

The depth of placenta accreta had a clear influence on the level of blood loss. Superficial forms did not cause blood loss of more than 1.5 liters. Blood loss of more than 1.5 liters was observed only among patients with placenta increta and placenta percreta. An important factor causing large blood loss, which has something in common with the depth of placental destruction, is damage to the bladder (see Table 2). Forced opening and resection of the bladder followed in 7 cases (13.0%); opening of the bladder without resection of its wall in 2 (3.7%). These complications during the operation were associated with obvious ingrowth of the placenta into the bottom and posterior wall of the bladder and severe adhesions. However, no damage to the bladder mucosa as a result of placental invasion was noted.

Of the 54 women with central PP and US, 2 (3.7%) intraoperatively (verified by histological examination) had a deeply invasive form of accretion not only in the US area, but also in the area of the posterior wall of the US and the body of the uterus. Their blood loss was 2,000 ml and 2,400 ml. Both cases resulted in hysterectomy (see Table 2).

The distribution of blood loss levels depending on the surgical methods of reduction showed the following results (Table 3). As one can see, the ligation of three pairs of the main vessels of the uterus was accompanied by blood loss of no more than 1.0 liters in only 1 case out of 7. These are the same 7 patients in whom CS was performed with a transverse incision along the upper edge of the placenta previa (see Table 2). As noted above, 1 of them did not have a deeply invasive lesion, did not have US failure, and did not require metroplasty. Therefore, we associate a small level of blood loss in this case with mild morphologic lesion. The remaining 6 women had blood loss in the amount of 2.0-3.5 liters: the minimum blood loss among them was 2.0 liters was in 1 woman, 2.5-3.0 liters in 3 women, and up to 3.5 liters in 2 women. The ligation of the internal iliac arteries before metroplasty and placental extraction is also beneficial (see Table 3). Of the 5 women among whom this method was performed, 4 patients had blood loss: 1,800 ml in 2 women, 1,900 ml in 2 women and 2,400 ml in 1 case. TCCIA and abdominal aorta were performed in 12 women out of 54 with the most complex, macroscopically confirmed lesion, where serious forms of US failure were noted with the formation of an extensive uterine hernia, significant forms of vascular hypertrophy in the US area, obvious signs of placenta ingrowth into the posterior wall and fundus of bladder. In 8 out of 12 women, blood loss did not exceed 1.5 liters, in 4 cases it didn't exceed 2.0 liters. The duration of clamping of the arterial lines did not exceed 35 minutes. The most effective way to reduce blood loss in our study was complex compression hemostasis according to R.G. Shmakov [5]. It was used in 30 women (55.6%) out of 54. The blood loss in all 30 cases did not exceed 1.5 liters: the median was 1,200, the minimum blood loss was 700 ml, the maximum was 1,500 in a single case.

Table 3

The level of blood loss with various methods of blood saving

Surgical methods for reducing blood loss, n (%)	Blood loss, ml				Total n=54
	500–1,000	1,001–1,500	1,501–2,000	2,001–3,500	
Ligation of 3 pairs of uterine vessels	1 (1.9)	–	–	6 (11.1)	7 (13.0)
Ligation of the internal iliac arteries	–	–	4 (7.4)	1 (1.9)	5 (9.3)
Temporary clamping of the common iliac arteries	4 (7.4)	4 (7.4)	3 (5.6)	–	11 (20.4)
Temporary clamping of the abdominal aorta	–	–	1 (1.9)	–	1 (1.9)
Complex compression hemostasis	15 (27.8)	15 (27.8)	–	–	30 (55.6)
Total	20 (37.0)	19 (35.9)	8 (14.8)	7 (12.9)	54 (100)

Hysterectomy was performed in 17 women (31.5%) out of 54. Of this number, 2 (11.8%) had a deeply invasive lesion of the posterior wall of the LUS and the uterine body in addition to the PAUS (as presented above) (Fig. 1 and 2). In one of them, CS was performed along the upper edge of the placenta previa, and this form of in-growth was established during an attempt to perform metroplasty. In the second case, an extensive lesion of the posterior wall of the LUS and the body of the uterus (along the anterior and posterior walls) was found during a bottom CS. The level and area of placental invasion was so obvious that a hysterectomy followed without attempting a metroplasty. The factor of intense bleeding as a result of CS along the upper edge of the placenta previa had the greatest influence on the need for hysterectomy: in 6 women out of 7 (see Table 2). In total, hysterectomy was performed in 9 out of 17 women after fundal CS without attempts at metroplasty, and in 2 women after such attempts (see Table 2). The main indication for organ removal, in addition to the extent and depth of placental destruction, was significant blood loss that occurred before the start of the operation in patients admitted on an emergency basis (20 women out of 54). The blood loss before the operation among these 20 patients ranged from 300 to 800 ml, on average 532±210 ml, median 450 ml.

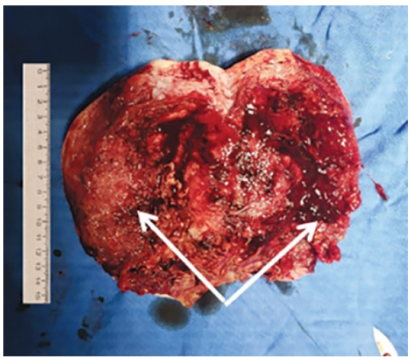

Fig. 1. Patient M., 32 years old, G3P3. Diagnosis: Pregnancy, 36 weeks. Two scars on the uterus. Central placenta previa with growth into the uterine scar. Placenta accreta spectrum. Macropreparation: the removed body of the uterus with an ingrown placenta in the body and lower segment of the uterus (indicated with arrows)

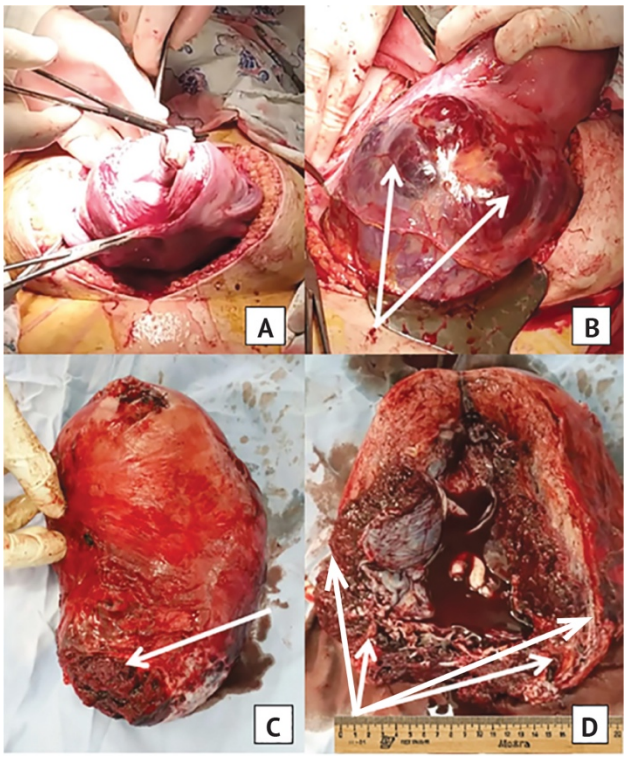

Fig. 2. Patient N., 28 years old, G4P4. Diagnosis: Pregnancy, 34 weeks. Three scars on the uterus. Central placenta previa with ingrown uterine scar. Placenta accreta spectrum. A — intraoperative picture after fundal caesarean section; B — bulging of the lower segment of the uterus. Arrows indicate local areas of placental germination to the serous membrane in the lower segment of the uterus; C — macropreparation, the removed body of the uterus with ingrown placenta. The arrows indicate the zones of placental destruction of the posterior wall of the lower uterine segment; D — macropreparation, the removed body of the uterus in the section. Arrows indicate areas of placental germination along the anterior and posterior walls of the lower uterine segment

The list of postoperative complications included endometritis in 2 (3.7%) cases, urinary tract infection in 4 (7.4%) cases, formation of hematomas in 3 (5.6%) cases. There was no repeated laparotomy, and no thromboembolic complications, including those associated with temporary closure of arterial lines, were noted. There was no maternal mortality, perinatal losses were observed in 4 cases (7.4%) out of 54 as a result of antenatal fetal death at 31 weeks of pregnancy - in 1 (1.9%), extreme prematurity - in 3 (5.6%).

DISCUSSION

It is likely that few people doubt that US after CS provokes an increase in the frequency of PP. As shown in our study, this occurs approximately 6 times more often than in the general population. It has already been noted that the more serious the scar is, the more often abnormal placentation occurs, although these considerations require additional evidence. But if the increase in PP and PA in the area of failed US is understandable and the genesis of these events is built without much difficulty on the classical pathophysiological platform, then the occurrence of severe placental invasion in areas free from scar changes, occurring simultaneously with PAUS in the same clinical case, do not fit into the classical model of PAS pathophysiology. Since J. Beard suggested at the beginning of the last century that the behavior of malignant tumors and trophoblast is similar, works on this topic have periodically appeared in the scientific literature. It received a new impetus in connection with the current state of the GPRM problem. Recently, great importance has been given to the balance between genes regulating activity and chorion suppression [6, 7]. In these works, the key importance is attached to the so-called Kiss gene, discovered in 1996 in the cells of some malignant tumors. However, its role in the suppression of cancer of various locations has been established relatively recently. At the same time, its active participation in trophoblast invasion into the endometrium has been shown [8], and its highest concentration in the human body was found in the placenta. Recent reports indicate that increased expression of EGFR (epidermal growth factor receptor) by syncytiotrophoblasts during placenta accreta suggests that abnormal villous adhesion develops as a result of abnormal expression of growth factors, angiogenesis, and invasion in trophoblast populations. The authors conclude that vascular endothelial growth factor (VEGF) and sFLT-1 play a key role in the pathological programming of extravillous trophoblast towards increased invasiveness in PAS [9]. However, the question still remains open: is this the result of a certain genetic mutation in the population or this process can be induced by the characteristics of US. In these works there is no clear answer to the question: do these conclusions correct only for PAUS, or do they have a broader extrapolation, affecting observations of placental invasion into the myometrium, free from scar changes. In the end, we are talking about how local the process is, i.e. affecting placentation exclusively in the scar area of the uterus or how systemic it is in involving the entire placenta. The interpretation of incoming reports about deeply invasive forms of placenta accreta in areas of the uterus that are free from scar changes depends on this. According to the present study, this occurs in approximately 1:27 patients with central presentation due to US.

In one of the latest works by J.M. Palacios-Jaraquemada et al., (2019), regarding the most complex cases of PAS (˝near miss˝) it was shown that prenatal imaging (ultrasound or MRI) detected an invasive placenta in only 54.4% of ˝near miss˝ cases (95% CI 41.0–67.5), and in 45.2% (95% CI 32.5–59.0) they were revealed intraoperatively [10, 11]. Also of note: in 22.1% of PAS cases (95% CI 9.7–37.9) diagnosed prenatally, the severity of ingrowth identified intraoperatively was greater than that reported preoperatively. There is still no conclusive evidence on whether prenatal imaging can identify cases at highest risk of PAS, those in whom adverse maternal outcome is expected [12–15]. If the ˝near miss˝ cases of in the studies of J.M. Palacios-Jaraquemada were mainly associated with damage to the posterior wall of the bladder, then in our observations this should probably be associated with not entirely justified attempts at delivery by performing a CS along the upper edge of the placenta previa. In light of the above works, and also taking into account our own experience, it should probably be recognized that such an approach can be justified when the endovascular block is performed simultaneously at the level of the common iliac arteries [16] (the so-called Triple-P technique), and when In the absence of balloon occlusion, relying on ligation of three pairs of uterine vessels after fetal extraction is an unjustified risk.

In the 2 cases presented by us, PA in the posterior wall of the LUS and the body of the uterus, prenatal diagnosis was incomplete, since the protocols did not indicate such a probability in areas free from scarring. Most likely, this should be associated with a lack of experience in such observations among specialists in ultrasound diagnostics. However, the intraoperative picture left no doubt, and histological diagnosis confirmed these observations. In both patients, the operation proceeded according to the same scheme: fundal CS, clamping of the common iliac arteries. Despite the timely ascertained macroscopic signs of deeply invasive placenta ingrowth in the area of the posterior wall of the LUS and the uterine body along the anterior and posterior walls, surgeons made attempts to preserve the organ. However, uncontrolled bleeding eventually led to a hysterectomy. We could not explain the lost blood volumes in the 2 clinical episodes studied by us with anything other than attempts to preserve organs in the case of obvious extensive placental destruction. Many experts, wondering about obtaining massive blood loss, despite

the block being installed at the level of the common iliac arteries by one method or another (as in our cases), point out that even in these conditions there are bypass arterial collaterals to the uterine arteries. The most important of them, as was established in the studies of J.M. Palacios-Jaraquemada et al., (2019), is the pool of the inferior mesenteric artery, which during pregnancy increases 2-3-fold in diameter of the main vessel.

In this discussion, it is probably necessary to touch upon expectant management, leaving the placenta in situ. It should be noted that today, expectant management does not have direct recommendations from international organizations monitoring this problem (ACOG, FIGO), and the main reason for this is the alarming and well-known range of postoperative complications [2, 17, 18]. Hysterectomy in most studies, including international expert groups, is positioned as a completely justified stage of completion of surgery for PAS. At the same time, some obstetric schools, probably with good reason, approach the issue of preserving the uterus very carefully, trying to achieve high rates. Using angiographic aids, a number of Russian researchers achieve good results in organ preservation [3, 17], despite the PAS forms being extremely severe in depth and area. In our opinion, modern obstetric science is at the epicenter of this discussion, and the results of research are affected not only by technological equipment, but also by regional characteristics such as fertility rates.

Based on our own experience, we can assume that the method of complex compression hemostasis according to R.G. Shmakov in the near foreseeable future will become the basis for operative delivery of patients with PAS. Such a point of view was formed as a result of a fairly long practical work with this contingent, and a deep conviction arose in the final correctness and the triumph of natural evolution, including human-controlled processes, where simplicity and expediency reign. In this technique, there is only one weak point, that is, the limitation of its use - these are cases of serious complications associated with PA into the bladder, when its dissection (to ensure the imposition of a "noose" on the initial sections of the cervix) can be associated with the onset of uncontrolled bleeding. A detailed discussion of this issue is a separate topic. But here it should be noted that cases of severe PA into the bladder are fortunately rare and therefore the method of complex compression hemostasis can rightfully occupy the main niche of blood-saving technologies in PAS.

CONCLUSION

1. The pathogenetic aspects of deeply invasive placental invasion into various parts of the uterus, free of scarring, in placenta accreta spectrum, have been poorly studied and not defined.

2. Causes of ˝near miss˝ cases with placenta accreta spectrum may be insufficient prenatal diagnosis and unjustified surgical techniques associated with that.

3. If signs of deeply invasive damage to the placenta accreta spectrum of the posterior wall of the lower segment of the uterus or the body of the uterus are detected (prenatally or intraoperatively), the likelihood of a hysterectomy is high. In such cases, in the absence of endovascular methods for controlling uterine bleeding, hysterectomy is justified.

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