Pan-American Society *for the* Placenta Accreta Spectrum

5th Annual Meeting

Stanford University

October 7-8, 2023

Research Presentation Abstracts

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Heat Shock Protein expression in syncytiotrophoblast and villous endothelial cells in cases of Histologically Confirmed Placenta Accreta Spectrum

Erica Smith, M Zehra Ordulu-Sahin, Rebecca Wilson, Alyssa Williams, Alyssa Tripler, Veronia Sadek, Marcella Rodriguez, Mackenzie, Dyrda, Mehmet Genc, Helen Jones

Introduction: Placenta accreta spectrum (PAS) can result in hysterectomy, hemorrhage and even maternal death at time of delivery. Current mechanistic theories differ, one implies a fetal etiology (invasive trophoblast) while the other implies maternal disease. Previously, differential HSP signatures were associated with PAS in serum and placental proteomic studies and mouse models. We determined if Heat Shock Proteins (HSP) 27, 60, 70 or 90 were differentially expressed in histologically-identified PAS placentas and if expression depended on severity of disease.

Study Design: Under IRB approval patient specimens identified retrospectively were categorized as control, PAS "focal" (not requiring hysterectomy), and PAS grades 1-3, (Table1). Full thickness and "most invasive" (determined by pathology) specimens were selected for Immunohistochemistry against HSP27, 60, 70 or 90. Slides were scanned with the Zeiss Axioscan and staining scored in the following cell types: Extravillous Trophoblast, Syncytiotrophoblast, Cytotrophoblast, villous Fibroblasts, and Endothelium. We graded expression using semiquantitative scoring: –, +, ++, +++. Chi Square and Fisher exact test were used to compare control to the grade of accreta as well as control to adherent PAS (focal +grade1) and severe PAS (grade2 +grade3).

Results: HSP 27 expression was reduced in severe PAS compared to control syncytiotrophoblast nuclei $x^2(2,N=16)=10.41,p=0.01$). HSP70 was increased in the endothelial cytoplasm $x^2(2,N=16)=8.42,p=0.02$) and control vs. grade3 in the syncytial cytoplasm($p=0.02$). No significant difference in HSP90 or HSP60 expression was seen.

Conclusion: Increased HSP70 has been previously described in vascular activation of the placenta related to stress response. Increased HSP27 has been linked with decreased depth of trophoblast invasion, this study indicated decreased HSP27 which may be expected in the depth of placentation associated with PAS. Though there is not clear evidence of fetal determination of abnormal placentation, this study does demonstrate that the placenta does differentially express HSP27 and HSP70 in the setting of severe PAS.

Transfusion-reducing techniques decrease perioperative morbidity of cesarean hysterectomy for placenta accreta spectrum

Alexandra J. D. Phelps, MD; Addie Alkhas, MD; Michael B. Noone, MD; Calla Holmgren, MD; Rachel Harrison, MD; Guy Steinberg, MD

Objective: Placenta accreta spectrum (PAS) is associated with high rates of hemorrhage and serious morbidity. Transfusion-free surgical techniques have been used successfully in cardiac surgery to reduce blood loss and blood utilization. The purpose of this study is to evaluate the impact of transfusion-free techniques on perioperative morbidity for women undergoing planned Cesarean hysterectomy for suspected PAS.

Study Design: This was a cohort study of women undergoing scheduled Cesarean hysterectomy for PAS at a tertiary center from 2011-2021, before and after initiation of a transfusion-free protocol in December 2016. The protocol included use of iron supplementation, tranexamic acid (TXA), the LigaSure vessel sealing system, intraoperative ultrasound-guided placental mapping, intraoperative blood salvage, and topical hemostatic agents. Primary outcomes were estimated blood loss (EBL), rates of large-volume transfusion (four or more units of packed red blood cells), and intensive care unit (ICU) utilization.

Results: 55 patients were included in the study, 20 from prior to implementation of the transfusion-free protocol and 35 from after. Groups were similar in terms of age, body mass index, parity, and uterine surgical history. The transfusion-free group had greater use of iron, TXA, LigaSure, and placental mapping. There was decreased EBL (median 1500 [750 – 2000mL] vs. 2750 [1850 – 3500mL], $p < .001$), large-volume transfusion (n=5 (14.3%) vs. n=12 (60%), $p < .001$) and ICU admission (n=9 (25.7%) vs. n=18 (90%), $p < .001$) in the transfusion-free group.

Conclusion: Surgical blood loss and blood transfusion can be safely reduced in patients undergoing scheduled Cesarean hysterectomy for suspected placenta accreta spectrum by using the principles of transfusion-free medicine. This approach is likely to reduce perioperative costs and utilization of a limited blood supply and may reduce transfusion-related morbidity, though further study is needed to confirm this hypothesis.

Selective aortic balloon occlusion in Placenta Accreta Spectrum: retrospective review of utilization and outcomes

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Objective: Aortic balloon occlusion (ABO) has been used to control hemorrhage in trauma and placenta accreta spectrum (PAS) surgery. However, ABO is associated with cost and resource allocation and unique risks including vascular injury, thrombosis, and requires trained providers for use and management of complications. We shifted from universal to selective ABO access following 3 cases of VTE with a 7Fr ABO in 2019. We aimed to describe contemporary ABO use within a multidisciplinary PAS center, based on suspected disease severity, intraoperative findings and active hemorrhage.

Study Design: Retrospective study of all PAS patients between Jan 2020-July 2022 at a single center. Patients were grouped as ABO deployed, sheath only and control (no sheath/no ABO). Charts were abstracted by a single reviewer and validated by a PAS expert. Demographics, FIGO clinical PAS grade, blood loss, units transfused, nadir of H/H, coagulation profiles and maternal outcomes (Table) were compared between group using Chi-squared tests and Two-way ANOVA with multiple comparisons (GraphPad Prism 9.4.1, $P< 0.05$ = significant).

Results: 60 patients with confirmed PAS delivered during the study period, in whom 17 (28%) had femoral artery access with a 4Fr arterial cannula. ABO (4Fr or 7Fr) was deployed when excess bleeding was encountered in 5 cases (8.3%). One required emergent ABO following manual aortic compression. No maternal deaths, vascular complications or venous thrombotic events occurred in the cohort. Blood loss and rate of red blood cell (RBC) transfusion was higher in the ABO-deployed group, as was FIGO Clinical Grade. Blood loss and transfusion rates did not differ significantly between sheath only and control groups.

Conclusion: Our data support selective ABO deployment prophylactically for extensive PAS cases or therapeutically for ongoing, uncontrolled hemorrhage as a pragmatic approach to balance the risks of massive hemorrhage with the risks and cost of femoral artery access and aortic balloon occlusion.

	Sheath placed with ABO n=5	Sheath placed without ABO n=12	PAS without femoral artery access n = 43
Age	33.0 (29.5, 37)	34.5 (30.3, 36.8)	35.0 (31.0, 38.0)
Prior CD	3 (2,4)	3 (2,4)	2 (1,3)
BMI on admission (kg/m2)	24.5 (21.0, 34.5)	34.2 (27.7, 41.5)	32.4 (29.2, 40.7)
Urgent/Emergent Delivery n (%)	3 (60%)	4 (36.4%)	11 (25.6%)
Quantitative blood loss (mL) *	**5440 (984, 8505)**	**1035 (638, 1616)**	**1500 (1018, 2297)**
Red blood cell units *	**6 (2, 14)**	**0 (0,0)**	**1 (0,3)**
Fresh frozen plasma	3 (1, 6)	0 (0,0)	0 (0,0)
Cryoprecipitate (pooled units)	3 (1,6)	0 (0,0)	0 (0,1)
Platelets (apheresis units)	1 (0.2)	0 (0,0)	0 (0,0)
Lowest Hgb (g/dL)	9.6 (7.4, 10.6)	10.1 (9.5, 10.4)	9.4 (8.7, 10.4)
Highest INR	1.2 (1.0, 6.9)	1.1 (1.0, 1.75)	1.1 (1.1, 1.1)
Lowest Fibrinogen(mg/dL)	274 (137,330)	398 (324,529)	348 (303,409)
FIGO Clinical Grade n (%) **	**3C: n=5 (100%)**	**1: n = 0 (0%)** **2: n = 3 (16.6%)** **3A: n= 5 (41.7%)** **3B: n=2 (16.7%)** **3C: n=2 (16.7%)**	**1: n=13 (30.2%)** **2: n=13 (30.2%)** **3A: n=5 (11.6%)** **3B: n=6 (13.9%)** **3C: n=6 (13.9%)**
Gestational age at delivery	32 (26 1/7, 34 5/7)	34 2/7 (32 1/7, 34 6/7)	34 3/7 (33 1/7, 35 2/7)
ABO-related complications (n)	0	0	0

P-UAE is a technically distinct procedure compared to UAE.

Gabrielle E van den Hoek, MS; Luke A Gatta, MD; Jennifer B Gilner, MD, PhD; Waleska M Pabon-Ramos, MD, MPH; Amanda M Craig, MD; Anne W Honart, MD, MPhil; James S Ronald, MD, PhD; Jonathan G Martin, MD, PhD

Objective: Placenta accreta spectrum (PAS) may lead to massive obstetric hemorrhage and necessitate definitive hysterectomy. One emerging adjunct to surgery is multivessel transcatheter endovascular embolization, performed by Interventional Radiology. Though derived from the established technique of uterine artery embolization (UAE), multivessel embolization for PAS is performed in different pelvic surgical planes, has different embolization material, and has different procedural goals. Therefore, in order to distinguish this method from UAE, our institution names the approach *placental* uterine artery embolization (P-UAE). As this technique is novel to many PAS teams and pelvic surgeons, the purpose of this abstract is to differentiate UAE and P-UAE with an emphasis on technique and to describe the impact of the procedure on radiation exposure and fluoroscopy outcomes.

Study Design: Our institution routinely includes IR for all anticipated PAS cases. The three IR clinicians explain the step-by-step process of P-UAE. To describe radiation exposure and fluoroscopic outcomes, we retrieved data from the prior 33 cases (27 scheduled, 6 unscheduled). The mean and range of this data is reported. The radiation and fluoroscopic exposure of traditional UAE is presented from The American College of Radiology Dose Index Registry, which has published its data along a percentile distribution. The 50th percentile and the range of 25th and 75th quartiles are reported for context and not for comparison.

Results:

	UAE	P-UAE
Goals of the Procedure	Uterus-sparing intervention to improve bleeding, bulk, and pain symptoms in patients with symptomatic uterine fibroids and/or adenomyosis	Targeted multi-vessel embolization as a prophylactic, EBL reducing measure during cesarean hysterectomy in patients with PAS or at risk for primary postpartum hemorrhage
Embolization Materials Utilized	Varies, most commonly 500-700mm tris-acryl gelatin microsphere particles	1000-1180mm non-spherical contour PVA particles Gelfoam slurry
Angiographic Technique	Bilateral uterine arteriogram pre- and post-embolization +/- aortogram for ovarian collateral supply	Bilateral uterine arteriograms pre- and post-embolization Post uterine artery embolization internal iliac arteriograms to better delineate collateral supply to placenta +/- pre- and post-embolization aortogram for additional collateral supply
Vessels Embolized	Peri-uterine arterial plexus distal to the horizontal uterine artery	1. Proximal uterine artery ostium 2. +/- collateral and placental perforator arteries
Fluoroscopy Time (min)	50th Percentile: 35.6 (26.0, 57.2) [1]	Scheduled Mean: 14.7 (11.5, 18.8) Unscheduled Mean: 17.2 (17.1, 18.1)
Total Radiation Exposure (mGy)	50th Percentile: 914.4 (401.2, 1832.5) [1]	Scheduled Mean: 831.6 (504.8, 1179.2) Unscheduled Mean: 3128 (880, 4216)
Dose Area Exposure (mGy/cm^2)	50th Percentile: 125.12 (59.71, 271.01) [1]	Scheduled Mean: 270.8 (151.4, 381.6) Unscheduled Mean: 1097.1 (333.3, 1518.4)

Conclusion: P-UAE is a technically distinct procedure compared to UAE.

References:

[1] Jones, A. Kyle, Kevin A. Wunderle, Tom Fruscello, Michael Simanowith, Brendan Cline, Shalmali Dharmadhikari, Xinhui Duan et al. "Patient Radiation Doses in IR Procedures: The American College of Radiology Dose Index Registry-Fluoroscopy Pilot." Journal of Vascular and Interventional Radiology 34, no. 4 (2023): 544-555. https://doi.org/10.1016/j.jvir.2022.11.003

Postpartum depression among patients treated for placenta accreta spectrum at a large academic center

Erin Bailey, Frank Lin, Katharina Stewart, Janine Rhoades, Michael Beninati

Objective: Patients with complex birth experiences, such as cesarean hysterectomy, are at increased risk of postpartum depression. A placenta accreta care center (PACC) was established at our institution in 2021 with coordinated protocolized antenatal planning through multidisciplinary care and an antenatal placenta accreta spectrum (PAS) checklist. We performed a quality improvement project to analyze impact on outcomes before and after establishment of the PACC. Our primary outcome was depression as measured by 6 week postpartum EPDS score. We hypothesized that patients receiving care through the PACC would have lower EPDS scores compared to patients not part of the center.

Study Design: All patients who underwent a hysterectomy performed for PAS from 2019-2023 were included in this retrospective cohort analysis. Patients were included as part of the PACC in this analysis if they completed the PAS checklist for antenatal care and were delivered by our accreta team. Maternal and surgical outcomes were compared for patients involved in the PACC compared to those not. Additionally, zip codes were used to analyze distance to the referring center from patient's home addresses.

Results: A total of 50 patients were included in this analysis, 15 of whom were in the PACC. Mean EPDS scores at 6 weeks trended lower in patients in the PACC, but were not significant (2.0 vs 5.1, $p = 0.13$). Placental pathology was significantly higher grade (grade 3 pathology 61.5% vs 22.9%, $p = 0.01$) with longer operative time and higher ICU admission rates without an associated increase in ≥4 units RBC transfusion (44.6% vs 64.3%, $p = 0.18$) or surgical complication (28.5% vs 28.5%, $p = 1.00$) than patients not in PACC. Patients in the PACC traveled significantly farther from their home address.

Conclusion: Following development of the PACC, our referral base expanded. Despite increased distance from home, and more severe pathology, there were not higher rates of complications or depression, as measured by EPDS scores. These data highlight the importance of psychosocial resources as part of multidisciplinary PAS teams.

	Standard Care (n=35)	**PACC (n=15)**	**Odds Ratio**	**95% confidence interval**	**P-value**
Placental Grade*					
1	12 (34.3)	1 (7.7)	0.22	0.03-1.56	0.06
2	15 (42.9)	4 (30.8)	0.72	0.29-1.77	0.45
3	8 (22.9)	8 (61.5)	2.69	1.28-5.67	**0.01**
Mean EPDS at 6 weeks	5.1 ± 5.1	2.0 ± 2.8	n/a	n/a	0.13
Mean travel time (min)	45 ± 10.7	92 ± 17.7	--	--	**0.02**
Mean travel distance (Km)	38.8 ± 6.7	71 ± 12.1	--	--	**0.01**
≥4 units RBC transfusion*	17 (44.5)	9 (60.0)	1.37	0.79-2.38	0.28
Maternal ICU admission (y/n)*	12 (30.8)	10 (66.7)	2.12	1.10-4.06	**0.02**
Operative time (minutes)	175	296	--	--	**<0.01**
Surgical complication rate*†	10 (28.5)	4 (26.7)	0.93	0.35-2.51	0.89

Data presented as *n(%) or ± standard deviation.

† Includes intraoperative surgical complications such as injury to surrounding organs, need for surgical re-operation related to the original case, and immediate (<2 weeks) postoperative complications including infection and thromboembolism

Bold font indicates significance at $p<0.05$

Assessing reliability of machine learning for sonographic diagnosis of histologic placenta accreta spectrum

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Objective: To assess the reliability of machine learning (ML) for the detection of histologic PAS.

Study Design: Retrospective review of 26-32 week ultrasounds of subjects managed by hysterectomy with PAS on final histology between 2020-2022 at a single site. For each subject, we included greyscale images and cine clips of the placenta, lower uterine segment, and cervix in the mid-sagittal plane. We excluded color Doppler images, images in the axial or oblique plane, and images where the bladder was subjectively non-distended. After images were selected, we annotated regions of the placenta, bladder, and uterus using LabelMe software. Once the images were annotated, we ran 4 independent algorithms using UNet and DeepLab V3 segmentation network, under a semi-supervised learning algorithm using Exponential Mean Average-Mean Teacher (EMA-MT) to assist in development of machine recognition of pixelated patterns to generate annotated regions. The primary outcome was the Dice coefficient, measuring the strength of agreement between the annotated and machine-generated images (scored 0.0 – 1.0, where 0.0 represents no overlap and 1.0 is perfect agreement). Secondary outcomes include Hausdorff distance, or a quantification of degree of non-agreement between annotated and output images.

Results: Out of 38 subjects including histologic PAS on uterine specimen, we annotated 357 sonographic frames. The annotated images were divided into training (n=259), validation (n=28), and testing sets (n=69). The training set was assessed using four algorithms:

(M1) DeepLabV3 with Cross Entropy Loss
(M2) DeepLabV3 with Dice Focal Loss
(M3) DeepLabV3 with Cross Entropy Loss and EMA-MT
(M4) DeepLabV3 with Dice Focal Loss and EMA-MT

The reliability data of the four models is listed below in Table 1:

	Dice Background	Dice Placenta	Dice Bladder	Dice Uterus	Hausdorff Placenta	Hausdorff Bladder
M1(baseline)	0.8539	0.8533	0.6700	0.5132	99.97	709.16
M2	0.8578	0.8487	0.7379	0.6085	112.36	725.46
M3	0.8573	0.8592	0.7705	0.5638	118.65	687.79
M4	0.8555	0.8634	0.5850	0.5758	101.94	837.20

Conclusion: Each machine learning model readily segmented the uterine-placental interface, and the placental detection was the most reliable and uterine detection was least reliable

Prophylactic 4 French Aortic Balloon Occlusion Shows Promise in Mitigating Hemorrhagic Morbidity of Placenta Accreta Spectrum

Chelsea Fitzhugh, MD, Jonathan Seibert, MD, Jennifer Philips, MD, Julio Mateus Nino, MD, PhD, Thomas Bradley, MD, Sean Dieffenbaugher MD, Gaurav Sachdev MD, Allison Puechl, MD, Gretchen Hoelscher, MS, Melissa Woolworth, MD

Objective: Placenta accreta spectrum (PAS) is associated with significant risk of hemorrhage, coagulopathy, and blood product transfusion. Zone 3 deployment of the 4 French aortic balloon (AoB) occlusion system reduces arterial blood flow to the pelvis and lower extremities. Our objective was to examine hemorrhagic morbidities among patients undergoing cesarean hysterectomy secondary to PAS with or without the use of the AoB occlusion system.

Study Design: Single-institution retrospective cohort study of patients undergoing cesarean hysterectomy for PAS before (pre-AoB cohort) and after (AoB cohort) implementation of routine, prophylactic use of a 4 French AoB occlusion system. The primary outcome was intraoperative estimated blood loss (EBL). Secondary outcomes included total number of blood products transfused perioperatively, pre- vs post-operative hemoglobin difference, and depth of placental invasion. Chi-square Test or Fisher Exact Test were used to analyze categorical variables. Student T-Test or Mann-Whitney Test were used to analyze continuous data.

Results: Thirty-one patients were included in the study, pre-AoB cohort (n=16) and AoB cohort (n=15). The median EBL was higher in the pre-AoB group than in the AoB group (1250mL; interquartile range (IQR) 1000mL-2875mL vs. 600mL; IQR 500mL-800mL; $P < 0.001$). Eleven patients (68.7%) in the pre-AoB group and four patients (26.6%) in the AoB group received blood products ($P = 0.047$). Transfusion of packed red blood cells and fresh frozen plasma were both higher in the pre-AoB group than in the AoB group (P-values <0.05). The median hemoglobin drop was 1.6 g/dl (IQR, 0.60-3.30 g/dl) in the pre-AoB group vs. 1.0 g/dl (IQR, 0.0-1.5 g/dl) in the AoB group ($P = 0.032$). Final pathological diagnosis of PAS including depth of placental invasion did not vary between groups. All patients who underwent AoB placement had a normal arterial duplex study postoperatively and there were no arterial access related complications in the immediate postoperative period.

Conclusion: This retrospective cohort study demonstrates that routine, prophylactic use of a 4 French AoB system is safe and has the potential to improve hemorrhagic morbidity related to PAS surgery. Benefits and complications of this intervention require further investigation.

Impact of tranexamic acid in a cohort of placenta accreta spectrum patients

Rachel Harrison, Alexandra Phelps, Nada Hussein, Guy Steinberg, Calla Holmgren

Objective: Use of tranexamic acid (TXA) is beneficial in the setting of obstetric hemorrhage. We sought to understand whether patients with placenta accreta spectrum (PAS) disorder benefit from TXA administration during cesarean-hysterectomy.

Study Design: This is an IRB-approved retrospective cohort study of subjects with suspected placenta accreta spectrum undergoing cesarean-hysterectomy in a single hospital system. Those who received TXA were compared to those who did not. The primary outcome was the rate of blood transfusion. Secondary outcomes included maternal ICU admission, massive transfusion, length of post-op stay, operative time, and a composite of adverse maternal outcomes. Chi-squared, t-tests, and fisher's exact test were used to compare baseline characteristics and a logistic regression was performed with possible confounders.

Results: A total of 87 subjects met criteria for the study, among those were 35 (40.2%) who received TXA. Baseline characteristics between groups were similar. Although not statistically significant in univariable analysis, there was a trend for those who received TXA to have lower blood loss overall (~2000 mL vs ~2300 mL, p=0.483) and be less likely to require transfusion (48.6% vs 69.2%, p=0.053). Further, they were statistically less likely to require ICU admission (22.9% vs 60.4%, p=0.001). There was no difference in the other secondary outcomes including the combined adverse maternal outcome (40.0% vs 44.2%, p=0.695). After controlling for confounders, TXA administration was independently associated with decreased rates of blood transfusion (aOR 0.23, 95%CI 0.08-0.68) and ICU admission (aOR 0.16, 95%CI 0.05-0.48).

Conclusion: TXA use in the setting of cesarean-hysterectomy for PAS was associated with decreased risks of transfusion and ICU admission.

Transverse Vs Vertical Skin Incision in the Surgical Management of Placenta Accreta Spectrum

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Objective: The objective of this study is to compare maternal outcomes for the surgical management of placenta accreta spectrum (PAS) between patients who underwent a vertical skin incision versus those who had a transverse skin incision.

Study Design: This is a retrospective review of patients with pathologically confirmed PAS undergoing scheduled surgery at our institution between 09/2019 and 07/2023. Starting in 10/2021, select patients were offered a transverse skin approach. Patients were eligible if the placenta was not covering the anterior uterine wall, as confirmed by bedside ultrasound by an MFM in the operating room. The transverse skin incision was approximately 18-20cm and used the patient's prior scar. The hysterotomy was started in the high anterior portion of the uterus and extended to the fundus without exteriorizing the uterus. Outcomes included: rate of maternal transfusion of > 4 units of packed red blood cells (PRBC), surgical complications, and need for conversion to general anesthesia (GETA).

Results:
Over the 46 month study period, 68 patients underwent scheduled surgery for PAS. Thirty-five patients had a vertical skin incision and 33 patients had a transverse skin incision. After initiation of the transverse incision approach, 33/38 (86.8%) patients were deemed to be eligible and had a transverse incision. No patients required conversion to a vertical incision intraoperatively. There was no difference between the 2 groups in the percentage of patients with placenta increta or percreta [Vertical 85.7% vs Transverse 84.8%, p= 0.91]. There was no difference in the rate of transfusion of > 4 units of PRBC [Vertical 14.3% vs Transverse 21.2%, p= 0.45], or in the rate of intraoperative complications (i.e., cystotomy) [Vertical 5.7%vs 12.1%, p= 0.42]. In patients with a transverse incision, a significantly higher number of patients received regional anesthesia without the need to convert to GETA [Vertical 28.6% vs Transverse 66.7%, p= 0.001].

Conclusion: In appropriately selected patients, a transverse skin incision can be used and was not associated with an increased risk of intraoperative complications or blood transfusion. A higher likelihood of not requiring conversion to general anesthesia was also observed with a transverse incision.

Exposure of model extravillous trophoblasts to cryopreservation agents decreases cell migration

Erica Smith, Catherine O'Byrne, Rebecca Wilson, Alyssa Williams, Alyssa Tipler, Mehmet Genc, Helen Jones

Objective: Cryopreservation agents (CPA) are used for embryo vitrification, a known risk factor for placenta accreta spectrum (PAS). PAS has historically been described as over-invasive placenta but with limited studies into the trophoblast etiology. We hypothesized that exposure to CPA would increase proliferation and invasion, representing a mechanism for over-invasion in PAS following embryo vitrification. Our study assessed impact of exposure to cryopreservation agents (CPA) on migration, proliferation, and invasion in a model of human extravillous trophoblast.

Study Designs: HTR8/SVneo cells (ATCC CRL-3271) were maintained in RPMI-1640 medium plus 10% FBS and 1% penicillin–streptomycin at 37°C, 5% CO2. Cells were divided into six experimental groups—(i)control (medium only), (ii)Dimethyl sulfoxide (DMSO), (iii)Ethylene Glycol, (iv)Serum Substrate Supplement (SSS) (v)sucrose and (vi)complete vitrification media. Migration (wound-healing assay), proliferation/viability (Crystal Violet Assay), and invasion assays were performed at 24 and 48 hours post-exposure. Experiments were performed in triplicate across 3 passages and compared to untreated controls. Statistical analysis utilized Shapiro-Wilk test to assess normality and One way ANOVA to compare treatments to control (GraphPad Prism V.9.3.1.).

Results: Neither proliferation nor invasion was regulated by exposure at either timepoint. In contrast, exposure of HTR8/SVneo cells to CPA components caused significant reduction in cell migration (wound closure) at 24hr compared to control; ethylene glycol (-15.7%, n=3, p=0.022), SSS (-0.207%, n=3, p=0.0018) and sucrose (-0.165%, n=3, p value 0.015) and at 48hr: SSS (-0.193%, n=3, p=0.006), Sucrose (-0.165%, n=3, p=0.023), and the complete vitrification protocol (-0.121%, n=3, p=0.034).

Conclusions: With migration impaired in HTR8-SVneo after exposure to CPA and a lack of impact on proliferation and invasion these studies suggest trophoblast abnormalities following vitrification may not underpin PAS etiology. Trophoblast migration at the maternal-fetal interface is a crucial part of placentation and implantation, the impairment demonstrated with exposure to CPA warrants further investigation.

A Roadmap to Safety: Decreased Intraoperative Injury with a Multidisciplinary Approach to Placenta Accreta

Harriet Rothschild, Rachel Levy MD, Arianna Cassidy MD, Jocelyn S. Chapman MD

Objective: To assess the impact of an evidence-based, multidisciplinary protocol for management of placenta accreta spectrum disorder (PASD) on perioperative complications in patients undergoing cesarean hysterectomy.

Study Design: This was a retrospective cohort study of patients who underwent cesarean hysterectomy for suspected PASD, comparing perioperative outcomes pre and post-implementation of the Multidisciplinary Approach to the Placenta Service (MAPS). We abstracted data from the medical records of all adult patients who underwent cesarean hysterectomy between 2012 and 2022. Only patients who were suspected to have PASD on prenatal imaging were included in the analysis. Proportions are compared using chi-square tests.

Results: Between 2012 and 2022, 80 patients with suspected PASD underwent cesarean hysterectomy with 40 (50%) before and 40 (50%) after implementation of the MAPS protocol. There were no differences between the two cohorts with respect to age, gestational age at delivery, body mass index and prior uterine surgery. After implementation of the MAPS protocol, the rate of intraoperative complications decreased (42.5 vs 12.5%, p=0.045). Subgroup analysis demonstrated decreased intraoperative complications for scheduled and urgent cases (37.5 vs 13.3%, p=0.03 scheduled; 62.5 vs 10.0%, p=0.02 urgent) and for patients with placenta accreta spectrum (PAS) Grade 2 or 3, but not those with PAS Grade 1 on final pathology diagnosis (53.6 vs 13.8% PAS Grade 2 or 3, p<0.01). There were no differences in blood loss, transfusion rate, postoperative complications, rate of intensive care unit (ICU) admission or overall length of stay between groups. In total, 46 patients underwent ureteral stent placement (10 pre- and 36 post-MAPS) and 36 patients underwent uterine artery embolization (UAE) (9 pre- and 27 post-MAPS). Patients who underwent either of these steps experienced fewer complications and smaller rate of ICU admission compared to those who underwent the same step prior to implementation of the MAPS protocol.

Conclusion: Implementation of our MAPS protocol was associated with reduced rates of intraoperative injury, particularly for patients with more severe pathology. Stent placement and UAE in patients with suspected PASD may contribute to this outcome.

When does vaginal bleeding prompt delivery in women with placenta accreta spectrum?

Lihong Mo, MD, PhD; Zahabiya H. Chithiwala, MD, MS; Jefferey Hoch, PhD; Herman Hedriana, MD

Objective: To characterize the clinical features when delivery occurs in placenta accreta spectrum (PAS) patients presenting with vaginal bleeding.

Study Design: This is a retrospective cohort study of PAS patients delivered at our institution between January 2015 and June 2021. Data collected include vaginal bleeding characteristics, delivery indications, and maternal/neonatal outcomes. All histologically confirmed PAS were included. Statistical analyses were performed using Student's t test, Chi square test, Wilcoxon signed-rank test and generalized linear regression models using generalized estimating equations.

Results: Of 170 women with low-lying placenta or previa, 57 (33.5%) met inclusion criteria. Of these, 45.6% (26/57) of patients had vaginal bleeding. Of the 26 patients, 10 (38.5%) were delivered prior to 34 weeks for significant vaginal bleeding. Eight of 10 patients (80%) underwent urgent cesarean. Twenty patients with vaginal bleeding had expectant management, of whom, 16 (80%) remained pregnant for 7 days or more. The following four risk factors were identified as reasons for delivery before 34 weeks: 1) first vaginal bleeding episode occurring after 32 weeks gestation, 2) with concurrent regular uterine contractions, 3) moderate to large amount of vaginal bleeding, and 4) had 1 or more episode(s) of vaginal bleeding prior to admission.

Conclusion: PAS patients presenting with vaginal bleeding after 32 weeks have a higher likelihood for unplanned delivery before 34 weeks. More studies are needed to guide delivery decisions in the context of vaginal bleeding in patients with PAS.

Risk factors for worsening placental invasion within a cohort of placenta accreta spectrum patients

Rachel Harrison, Alexandra Phelps, Nada Hussein, Guy Steinberg, Calla Holmgren

Objective: Risk factors for placenta accreta spectrum (PAS) are overall well understood. We sought to evaluate whether those with more severe disease (increta/percreta) have a subset of patient-specific risk factors that could assist in preoperative planning.

Study Design: IRB approved case-control study of patients diagnosed with PAS who underwent cesarean-hysterectomy with pathology confirmed findings. Those with final pathology of placenta increta or percreta were compared to those whose final pathology demonstrated placenta accreta. Baseline characteristics and pregnancy histories were compared between groups via student's t-tests and chi-squared analysis, and a backwards logistic regression was performed to evaluate individual factors associated with more severe PAS invasion.

Results: A total of 83 subjects met criteria with 51 (61.4%) diagnosed on pathology with increta/percreta. Those with increta/percreta had higher BMI (34.3 ± 7.0 vs 30.8 ± 8.0) and higher number of prior c-sections (2.2 ± 1.0 vs 1.7 ± 0.9), and were less likely to have undergone IVF (3.9% vs 21.9%) or have a previous c-section with two-layer closure compared to single-layer closure (25.0% vs 63.6%) (all $p<0.05$). After controlling for confounders, there was a trend for more prior c-sections to increase the risk of increta/percreta and for prior c-section with two-layer closure to decrease the risk, but these were not statistically significant (aOR 1.18, 95%CI 0.43-3.23, and aOR 0.51, 95% CI 0.18-1.46, respectively).

Conclusion: Our study did not identify patient specific factors that increased the risk for more severe PAS invasion, however, there was a trend for multiple prior c-sections and previous c-section with single-layer closure to be associated with increased risk.

Case Presentation: Gross Hematuria in PAS without bladder disruption

Amanda M. Craig, MD; Luke A Gatta, MD; Anne West-Honart, MD; Sarah C. Ellestad, MD; Brita K. Boyd, MD; Jennifer B. Gilner, MD, PhD

Objective: In this emblematic patient case, abnormal placentation caused severe hematuria without evidence of placental tissue within the bladder. This case illustrates gaps in our understanding of the urologic morbidity in placenta accreta spectrum, particularly with respect to the concept of dehiscence versus invasion during placental growth. Our objective is to review the clinical presentation, antenatal imaging, intraoperative findings, and gross/histologic pathology findings to adapt our approach to the concept of bladder "involvement" in PAS.

Study Design: The case for discussion involves a 33yo G4P2113 with 1 prior cesarean delivery, complete placenta previa, and clinically presenting with gross hematuria and severe lower abdominal pain at 23 weeks of gestation. Hematuria and pain were initially brought under control with continuous bladder irrigation, oxybutynin, and IV pain medication. Physical examination confirmed no vaginal bleeding, no evidence of intraabdominal bleeding, and there were no uterine contractions. Antenatal ultrasound revealed sonographic markers of severe PAS disease. There was normal fetal anatomy and external fetal monitoring, and betamethasone was administered. Gross hematuria recurred within 24h requiring blood product transfusion. The obstetric exam remained unchanged, however delivery was advised due to unstable maternal condition.

Results: The patient was delivered in a hybrid operating suite at 24w1d. The procedure involved pre-delivery cystoscopy with ureteral stent placement (Urology), femoral artery access (VIR), vertical midline abdominal entry, sonographic placental mapping, and delivery of a viable infant away from the placenta (MFM). Following hysterotomy closure, selective multivessel placental-uterine artery embolization was performed (VIR). The MFM surgical team then performed a total abdominal hysterectomy with findings notable for complete dehiscence of the prior low transverse hysterotomy, and extension of placenta between the peritoneal leaves of the left broad ligament toward the left pelvic sidewall. The bladder had dense adhesive disease to the uterus with neovascularization and engorged vessels within bladder serosa, but the bladder was able to be separated from the placenta.

Conclusion: Surgical findings of FIGO grade III placentation were confirmed by pathology review. There was no intraoperative urologic injury, and hematuria ceased immediately following removal of the uterus/placenta specimen. Even without direct bladder invasion, the ***maternally-derived and placentally-motivated*** blood vessels are put on significant tension as pregnancy progresses and can lead to gross hematuria and maternal hemodynamic instability in the most severe PAS cases.

Delivery outcomes in the subsequent pregnancy following the conservative management of placenta accreta spectrum disorder: A systematic review and meta-analysis

Objective: Cesarean hysterectomy is generally presumed to decrease maternal morbidity and mortality secondary to placenta accreta spectrum disorder (PAS). Recently, uterine-sparing techniques have been introduced in conservative management of PAS to preserve fertility and potentially reduce surgical complications. However, despite often expressing the intention for future conception, few data are available regarding the subsequent pregnancy outcome after conservative management of PAS. Thus, we aimed to perform a systematic review and meta-analysis to assess the subsequent pregnancy outcomes following conservative management of PAS.

Data sources: PubMed, Scopus, and Web of Science databases were searched from inception to September 2022.

Study eligibility criteria: We included all studies, with the exception of case studies, that reported the first subsequent pregnancy outcomes in individuals with a previous history of PAS who underwent any type of conservative management.

Study appraisal and synthesis method: The R programming language with the "meta" package was used. The random effects model and inverse variance method were used to pool the proportion of pregnancy outcomes.

Results: We identified five studies involving 1,458 subjects that were eligible for quantitative synthesis. The type of conservative management included placenta left in situ (n=1), resection surgery (n=1), and not reported in three studies. The PAS recurrence rate in the subsequent pregnancy was 11.8% (95% CI: 1.1-60.3, I^2 = 86.4%), and 1.9% (95% CI: 0.0-34.1, I^2 = 82.4%) underwent Cesarean hysterectomy. Postpartum hemorrhage occurred in 10.3% (95% CI: 0.3-81.4, I^2 = 96.7%). A composite adverse maternal outcome was reported in 22.7% of subjects (95% CI: 0.0-99.4, I^2 = 56.3%).

Conclusion: Favorable pregnancy outcome is possible following successful conservation of the uterus in a PAS pregnancy. Approximately one out of four subsequent pregnancies following conservative management of PAS experienced significant adverse maternal outcomes. Given such high incidence of adverse outcomes and morbidity, patient and provider preparation is vital when managing this population.

Effectiveness of Delivery Strategies for Placenta Accreta Spectrum Patients Presenting With Vaginal Bleeding

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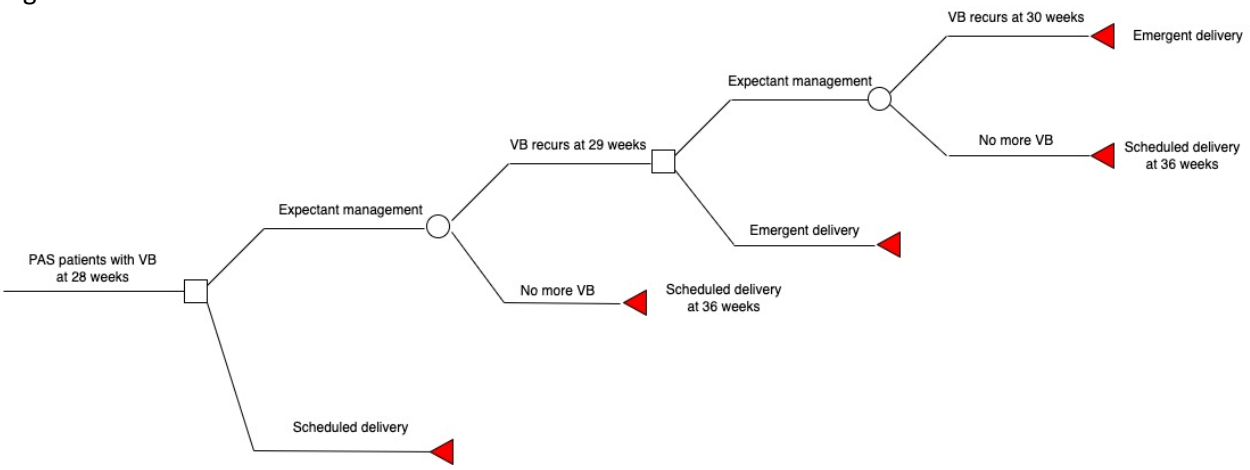
Objective: Vaginal bleeding (VB) is a common symptom experienced by patients with placenta accreta spectrum (PAS). No guideline exists in directing immediate delivery versus expectant management when patients present with non-persistent VB. We compared the highest quality-adjusted life years (QALY) and life years gained (LYG) between immediate delivery and expectant management.

Study Design: We constructed a decision analysis model (Fig. 1) on a hypothetical cohort of patients presenting with nonpersistent VB at gestational age (GA) from 28+0 to 36+6 weeks comparing expectant management vs immediate delivery. Outcomes factored into the model included maternal intensive care unit admission (ICU), perinatal mortality, incidental cystotomy, ureteral injury, wound complications, neonatal ICU admission, infant mortality, respiratory distress syndrome, bronchopulmonary dysplasia, mental retardation, and cerebral palsy. Probability and health state utility was derived from the literature and our patient outcomes. We assumed that patients gain at least one additional GA week if expectant management is chosen, with delivery planned at the third episode of VB or, if no VB, at 37+0 weeks GA. A one-way sensitivity analysis was performed over low, medium, and high risk of VB recurrence (mean: 0.556, 95% confidence interval [0.308, 0.785]).

Results: When risk of VB recurrence was varied by low (0.308) or medium (0.556) in the one-way sensitivity analysis, expectant management was consistently favored over immediate delivery. However, when risk of VB recurrence is high (0.785), expectant management resulted lower QALYs and LYG when VB first occurs at ≥34+0 weeks gestation. (Fig. 2)

Conclusion: This decision analysis suggests the preferred strategy for management in individuals with PAS presenting with non-persistent VB under a variety of circumstances is expectant management over immediate delivery. Considerations may be given to immediate delivery when VB recurrence risk is high at ≥34+0 weeks gestation given higher QALYs and LYG.

Figure 1


PAS patients with VB at 28 weeks
Expectant management
Scheduled delivery
VB recurs at 29 weeks
No more VB
Scheduled delivery at 36 weeks
Expectant management
Emergent delivery
VB recurs at 30 weeks
Emergent delivery
No more VB
Scheduled delivery at 36 weeks

Fellows versus leadership satisfaction with placenta accreta spectrum disorder education in the Maternal-Fetal Medicine and Gynecologic Oncology fellowships.

Oxana M. Zarudskaya, MD, Ph.D., Shriya Devkumar Das, BS[2], Nina Kumar, BA[2], Alixandria Fiore Pfeiffer, DO[1], Nora M. Doyle, MD, MPH, MSc[1], Angela Rodriguez Boyd, MD, PhD[1], John J. Byrne, MD[1], Michael D. Berkus, MD[1], Nicole M.P. Spencer, MD[3], Georgia McCann, MD[3], Patrick S. Ramsey, MD, MSPH[1]

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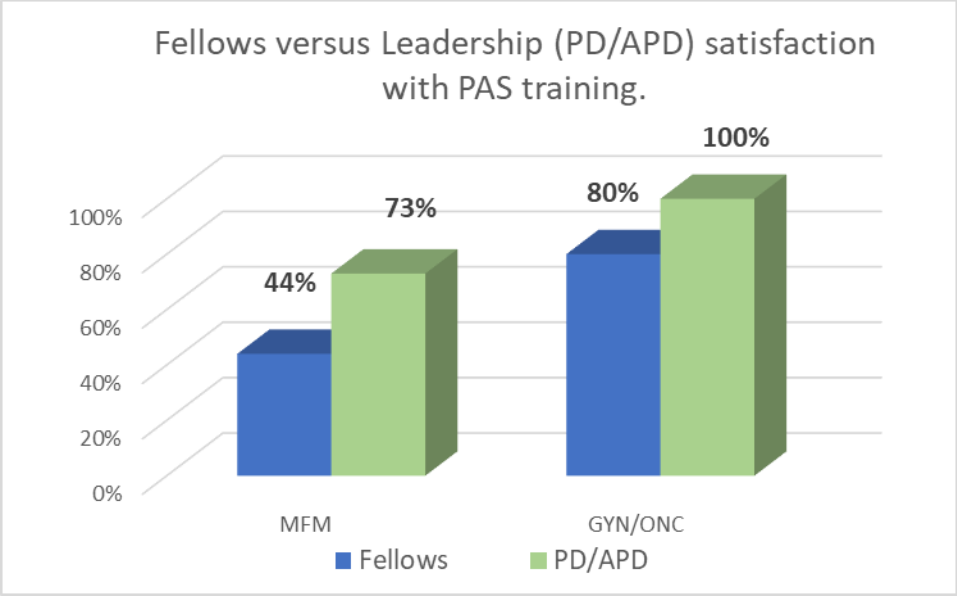
OBJECTIVE: Training in the management of placenta accreta spectrum disorder (PASD) is an important part of education in Maternal-Fetal Medicine (MFM) and Gynecology Oncology (Gyn/Onc) fellowships. Our objective was to compare fellows' satisfaction versus leadership (Program Director/Associate Program Director) satisfaction with PASD education during the fellowship.

STUDY DESIGN: An anonymous survey was distributed to all ACGME-accredited MFM and Gyn/Onc fellowship programs between 04/08/2023-07/30/2023. Only one response (program director or associated program director) per program was solicited from the leadership of each MFM or Gyn/Onc fellowship program. Satisfaction with training was assessed with a 5-point modified Likert scale, where satisfied with the training included answers “very satisfied” and “somewhat satisfied”.

RESULTS: Of the 60 responses received, 28 (46.6%) were from MFM fellows, 15 (25%) from Gyn/Onc fellows, 11 (18.3%) from MFM fellowship leadership, and 6 (10%) from Gyn/Onc fellowship leadership. Overall fellows’ satisfaction from both programs was 57.1%, ranging from 44.4 % among MFM fellows and up to 80% among Gyn/Onc fellows. MFM and Gyn/Onc fellowship leadership reported higher satisfaction with PASD-related training in their institution at 82.4%, ranging from 72.7% among MFM leadership to 100% in Gyn/Onc fellowship leadership.

CONCLUSION: Satisfaction among trainees in both fellowship programs was lower compared to the leadership satisfaction with PASD training in MFM and Gyn/Onc fellowship programs.


Fellows versus Leadership (PD/APD) satisfaction with PAS training.
100%
80%
60%
40%
20%
0%
44%
73%
80%
100%
MFM
GYN/ONC
Fellows
PD/APD

Ferumoxytol-Enhanced MR Demonstration of Changes to Internal Placental Structure in Placenta Accreta Spectrum: Preliminary Findings

Kliewer MA, Bockoven CG, Reeder SB, Bagley AR, Sadowski EA, Iruretagoyena JI, Beninati MJ, Fritsch MK

OBJECTIVE: To determine if ferumoxytol-enhanced MR might provide a new approach to the diagnosis of placenta accreta spectrum (PAS), and if so, to identify signs of PAS.

STUDY DESIGN: Ten pregnant women were referred for MRI evaluation for PAS. MR studies consisted of pre-contrast SSFSE, SSFP, DWI, and ferumoxytol-enhanced sequences. Post-contrast images were rendered as MIP and MinIP images to separately display the maternal and fetal circulations respectively. Two readers examined the images for architectural changes to placentone (fetal cotyledon) that might distinguish PAS cases from normal. Attention was given to the size and morphology of the placentone, villous tree, and vascularity. In addition, the images were examined for evidence of fibrin/fibrinoid, intervillous thrombus, basal and chorionic plate bulges. Interobserver agreement was characterized with kappa coefficients and levels of confidence for feature identification was recorded on a 10-point scale.

RESULTS: At delivery, there were five normal placentas and five with PAS (one accreta, two increta, two percreta). The ten changes of placental architecture in PAS included: focal/regional expansion of placentone(s); lateral displacement and compression of the villous tree; disruption of a regular pattern of normal placentones; bulging of the basal plate; bulging of the chorionic plate; transplacental stem villi; linear/nodular bands at basal plate; non-tapering villous branches; intervillous hemorrhage; and dilated subplacental vessels. All these changes were more common in PAS; the first five achieved statistical significance in this small sample. The interobserver agreement and confidence for the identification of these features was good to excellent except for dilated subplacental vessels.

CONCLUSION: Ferumoxytol-enhanced MR imaging can depict derangements of the internal architecture of placentas with PAS, thereby providing a promising new strategy to diagnose PAS.

Improved maternal outcomes with incorporation of placenta accreta spectrum disorders into maternal quality assurance and performance improvement program

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Objective: To evaluate the impact of a quality assurance and performance improvement (QAPI) program in women undergoing cesarean hysterectomy for placenta accreta spectrum disorders (PASD) at our institution.

Study Design: In July 2018 a multidisciplinary team and checklist were implemented for planned PASD at our institution. In January 2022 PASD was incorporated into a monthly maternal QAPI program. Additionally, at this time preoperative ureteral stents were incorporated into the PASD checklist. A single-center, retrospective cohort study was conducted of all patients undergoing cesarean hysterectomy for PASD between July 2018 and July 2023 at our institution. Two distinct periods were defined to compare outcomes: July 2018 through December 2021 (initial multidisciplinary team period) and January 2022 through July 2023 (current QAPI period). Primary outcomes included quantitative blood loss (QBL) and ICU admission rates. Secondary outcomes included units of packed red blood cells (PRBCs) transfused, ureteral injury rate, and hospital length of stay.

Results: There were 50 patients identified, 21 in the initial multidisciplinary team period and 29 in the current QAPI period. With the addition of QAPI for PASD the mean QBL decreased from 1580mL to 978mL (38% decrease) and ICU admission rates decreased from 4.8% to 3.4%. QAPI combined with preoperative ureteral stents decreased the ureteral injury rates from 16% to 3%. There was no change in the number of units of PRBCs transfused at 0.13u. The hospital length of stay remained stable at 3.8-3.9 days.

Conclusion: Incorporation of PASD into QAPI improved maternal outcomes including decreasing QBL, ICU admission rates, and ureteral injury. These results support the incorporation of PASD into QAPI.

Placenta percreta: a clinical case

Bettanin, Julieta; Martinez, Camila; Salgado, Victoria; Paller, Leo; Oholeguy, Paula

Objective: To Describe the interdisciplinary approach and management of a pregnant woman diagnosed with placenta percreta by the Gynecologic Clinic B at the Hospital de Clínicas and Gynecologic Clinic A at the Centro Hospitalario Pereira Rossell in Montevideo, Uruguay.

Study Design: Descriptive method. Case report.

Results: 32-year-old patient with a history of two previous pregnancies, one vaginal delivery and one cesarean section. Diagnosis of placenta percreta was suspected based on ultrasound findings at Centro Hospitalario Pereira Rossell at 33 weeks of pregnancy, and was referred to Hospital de Clinicas. Interdisciplinary follow-ups and discussions were conducted involving other specialties such as urology, anesthesia, radiology, hemotherapy, and neonatology to prevent maternal and fetal complications and define appropriate treatment. The patient remained asymptomatic throughout the pregnancy. A cesarean section was scheduled at 35 weeks of gestational age.
Prior to surgery, hemostatic balloons were placed in the hypogastric arteries and double-J catheters in the ureters. Placenta percreta was confirmed during a 6-hours surgery, which extended beyond the uterus and reached the bladder.
A separation plane between the anterior surface of the uterus and the bladder was not achieved, leading to the decision to resect the bladder dome. A circumferential colpotomy was performed, and the entire uterus was resected. Left ureteral reimplantation and vesical suturing were carried out. As a result, a female newborn with prematurity-related complications was delivered. With the implemented preventive measures, the patient remained hemodynamically stable, requiring a total of 3 units of red blood cells during surgery. After 15 days, she was discharged along with the newborn. The final diagnosis was confirmed through anatomopathological examination of the hysterectomy sample, revealing placenta percreta. Placental villi invaded the myometrial layer, reaching and perforating the uterine serosa. Another histological feature was the absence or minimal decidualized endometrium.

Conclusion: Prenatal diagnosis is of the utmost importance, enabling a more accurate treatment/management strategy and delivery plan. The interdisciplinary approach is highlighted as pivotal, as well as the existence of a specialized center for placenta percreta, serving as the sole pathway to mitigate maternal and neonatal morbidity and mortality.

Rate of Intraoperative Acidosis, Hypocalcemia, and Hyperkalemia in Patients Undergoing Surgery for Placenta Accreta Spectrum

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Objective: The objective of the study is to report the rate and severity of acidosis, hypocalcemia, and hyperkalemia observed during intraoperative point of care testing (POCT) in patients undergoing surgery for placenta accreta spectrum (PAS).

Study Design: This is a retrospective cohort of all patients with viable singleton pregnancies with a confirmed pathologic diagnosis of PAS who underwent cesarean hysterectomy at a single institution from 10/2018 until 06/2023. Intraoperative resuscitation was provided by an experienced team of obstetrical anesthesiologists. Point-of-care testing (POCT) with an epoc blood analysis system (Siemens Medical Solutions USA, Inc.) was performed at the discretion of the anesthesia team. Observed abnormalities were corrected intraoperatively by the anesthesia team as soon as identified. The primary outcomes included: rate of acidosis (pH <7.35), hyperkalemia (K^+> 5.5), and hypocalcemia (ionized Ca < 1.12 mmol/L).

Results: During the study period, 101 patients underwent surgery for PAS. POCT was performed in 88/101 (87.1%) cases. The range of pH observed was 7.18-7.48. A pH< 7.35 was observed in 52/88 (59.1%) cases. A pH < 7.20 was observed in only 2/88 cases (2.2%).
The range of potassium observed was 3.0-7.3 mmol/L. Hyperkalemia (K^+> 5.5) was observed in 8/88 (9.1%). Severe hyperkalemia (K^+ >6.5 mmol/L) was observed in 2/88 cases (2.2%). All patients with hyperkalemia (K^+ >5.5) had received ≥ 4 units of packed red blood cells (PRBC).
The range of ionized calcium observed was 0.56 - 1.27 mmol/L. Hypocalcemia was observed in 56/88 (63.6%) cases. Severe hypocalcemia (iCa < 0.8 mmol/L) was observed in 10/88 (11.4%) cases. Of the patients with severe hypocalcemia, 9/10 (90%) had received ≥4 units of PRBC, and the other patient had received 3 units of PRBC. None of the patients developed intraoperative cardiac arrhythmias.

Conclusions: POCT during surgery for PAS identifies a significant rate of acidosis and electrolyte abnormalities. Hyperkalemia and severe hypocalcemia are almost exclusively observed after 4 or more units of PRBC are transfused. Intraoperative monitoring of electrolyte abnormalities is critical to allow adequate resuscitation and prompt correction of electrolyte abnormalities.

Satisfaction of placenta accreta spectrum disease training and attitudes toward future involvement in placenta accreta spectrum cases during Maternal-Fetal Medicine and Gynecologic Oncology fellowships.

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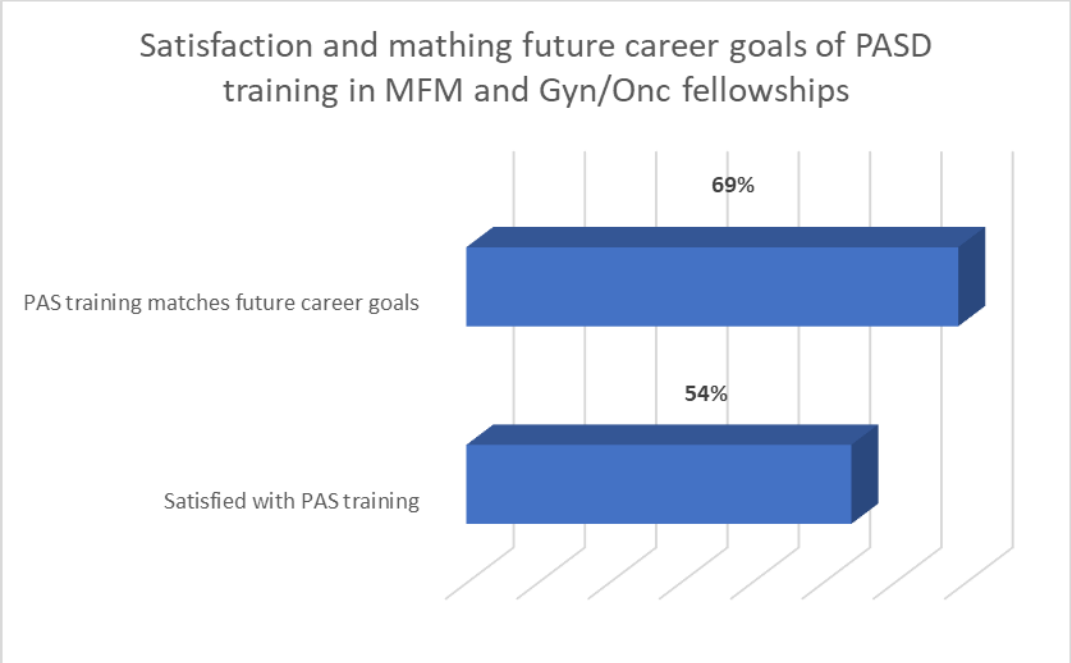
OBJECTIVE: To assess satisfaction of Maternal-Fetal Medicine (MFM) and Gynecologic Oncology (Gyn/Onc) fellows with placenta accreta spectrum disorder (PASD) training in their fellowship programs and attitudes toward future involvement in PASD cases.

STUDY DESIGN: An anonymous survey was distributed to all ACGME-accredited MFM and Gyn/Onc fellowship programs between 04/08/23-07/30/2023. The satisfaction with training, and future career goals regarding PASD surgical involvement was assessed with a modified 5-point Likert scale. Satisfaction with training was considered with answers “very satisfied” and “somewhat satisfied”. Matches to further career goals were considered with answers “matches” and “somewhat matches”.

RESULTS: Out of 43 responses, 28 (65.1%) were MFM fellows, and 15 (34.9%) were Gyn/Onc fellows. Out of all responders, only half 53.5% (23) were very satisfied or somewhat satisfied with PASD training in their fellowship programs. Nearly a quarter of responders 23.2% (10) reported that they were somewhat dissatisfied or very dissatisfied with PASD training in their institutions.

Regarding future independent careers and plans on participating in PASD cases, 28.6% reported that they are planning on participating in both cesarean section and cesarean hysterectomy portions of PASD cases. Nearly half of the responders (47.6%) preferred to keep the option open of participation in PASD cases in their future careers depending on the severity of the disease, local practice, and institutional policy. 69% of respondents agreed that current training in PAS overall matches their career goals. The level of satisfaction was lower (50%) and dissatisfaction higher (25%) among those trainees who are planning on doing PASD cases in the future.

CONCLUSION: Only half of the MFM and Gyn/Onc trainees were satisfied with their PASD training during fellowship. While over half of trainees reported that the training in their current institution overall matches their future career goals, those with future career plans that included the desire to participate in cesarean delivery and cesarean hysterectomy as indicated, reported lower satisfaction with training received during fellowship.


Satisfaction and mathing future career goals of PASD training in MFM and Gyn/Onc fellowships
69%
PAS training matches future career goals
54%
Satisfied with PAS training