Pregnancy outcome in women with prior placenta accreta spectrum disorders treated with conservative-reconstructive surgery: analysis of 202 cases

Jose. M. Palacios-Jaraquemada, Nicolás Basanta, César Labrousse and Marcelo Martínez

Department of Obstetrics and Gynaecology, CEMIC University Hospital, City of Buenos Aires, Argentina; Department of Obstetrics and Gynaecology, Fernández Hospital, City of Buenos Aires, Argentina; Department of Obstetrics and Gynaecology, Hospital Interzonal Dr. José Penna, Bahía Blanca, Argentina; CYMSA Clínica y Maternidad Suizo Argentina, Buenos Aires, Argentina

ABSTRACT

Aim: To report the outcome of pregnant women with a prior pregnancy complicated by placenta accreta spectrum (PAS) disorders treated with resective-conservative surgery at the time of cesarean section.

Materials and methods: Retrospective analysis of pregnant women treated with conservative surgery in the prior pregnancy complicated by PAS disorders. The primary outcome was spontaneous preterm birth with intact membranes or following a preterm labor rupture of the membranes before 37 weeks of gestation. Secondary outcomes were uterine rupture, need for hysterectomy due to severe ante or intrapartum maternal hemorrhage, myometrial thinning at the time of cesarean section, 5 min Apgar score, birth weight centile, and the occurrence of small for gestational age newborns. All these outcomes were observed in women with prior PAS treated with conservative resective surgery divided according to the topographical surgical classification.

Result: Pregnancies included: 89.6% (181/202) related to PAS type 1; 7.9% (16/202) related to PAS type 2, and 2.5% (5/202) related to PAS type 3. 90% of cases (162/179) (95 CI: 90.3 – 90.6) completed the pregnancy at term (greater than 37 weeks). The average intergenic period was 15 months for PAS type 1 and 2 (SD 4.76) (Q1:12; Q3:19), and 18 months for PAS 3 (SD 6.56) (Q1:14, Q3:19). A few mothers presented some complications PPROM 1; premature labor 4; hypertension 2; atony 1; overweight 1; and gestational diabetes 2. The mean age was 30 years (T1), 31 years (T2), and 36 years (T3). The uterine segment was thicker than usual except for one case of partial uterine dehiscence (twins). There were no placenta previa or PAS, a uterine atony case, and there was one case of hysterectomy by patient request.

Conclusions: Subsequent pregnancies after use of resective-reconstructive for PAS has demonstrated to have similar maternal and neonatal outcomes to typical gestation and cesarean delivery.

Introduction

Placenta accreta spectrum (PAS) encompasses a heterogeneous group of conditions characterized by an abnormal adherence or invasion of the trophoblastic tissue through the myometrium and eventually the uterine serosa [1]. Placenta previa and a prior cesarean section or uterine surgery represent the main risk factors for PAS occurrence, whose incidence has dramatically increased in the last three decades worldwide [2]. Pregnancies complicated by PAS are at increased risk of severe maternal surgical morbidities, including severe life-threatening hemorrhage, need for blood transfusion, and damage to adjacent organs, especially when such conditions are not diagnosed prenatally.

There is no randomized controlled trial exploring the different treatment options in women with PAS. Although hysterectomy is the most common surgical approach to treat PAS worldwide, recent evidence suggests that conservative techniques may reduce the magnitude of blood loss during CS. Such techniques, including the one-step conservative surgery, either the local uterine resection or aim at removing the part of the uterus invaded by the placenta, restoring the uterine anatomy, thus avoiding hysterectomy [3–7]. Although these techniques are primarily employed to...
reduce blood loss during CS, there is no data on sub-
sequent pregnancies after a resective conservative PAS
treatment. This study aimed to report pregnant wom-
en’s outcomes after conservative resective surgery for
PAS in the prior pregnancy.

Materials and methods

This report was a retrospective cohort study including
pregnant women with a prior gestation complicated
by PAS and treated with conservative resective surgery.

The primary outcome was spontaneous preterm
birth with intact membranes or following a preterm
labor rupture of the membranes before 37 weeks of
gestation. Secondary outcomes were uterine rupture,
need for hysterectomy due to severe ante or intrapar-
tum maternal hemorrhage, myometrial thinning at the
time of cesarean section, 5 min Apgar score, birth
weight centile (according to INTERGROWTH reference
charts), and the occurrence of small for gestational
age newborns, defined as a weight of less than the
ten percentiles. All these outcomes were observed in
women with prior PAS treated with conservative
resective surgery divided according to the surgical
topographical classification proposed by Palacios-
Jaraquemada et al. in:

- PAS type 1: the placenta reached to or beyond the
  serosa, with the presence of newly formed vessels
  between the uterus, placenta, and bladder and in
  relation with the upper posterior bladder
- PAS type 2: the placenta reached to or beyond the
  serosa with the placental parametrial invasion
- PAS type 3: the placenta invaded the posteroinfe-
 rior area of the bladder (trigone-cervical invasion)
  with a shared blood supply between the bladder,
  cervix, and vagina.
- There are no subsequent pregnancies for PAS type
  4. Trigone-cervical invasion with intense
  fibrous tissue

Main maternal and neonatal variables were ana-
yzed at the time of delivery. The first viewing
included direct observation of the hysterotomy, 2 cm
above the vesical reflection; then, the lower retrovesi-
cal uterus was evaluated by digital inspection to con-
firm the myometrial thickness. Patients did not receive
any specific medication, drugs, or prophylaxis in the
subsequent pregnancy.

Quantitative variables were expressed as mean and
standard deviation (SD), while qualitative variables
were expressed as percentages. Interquartile ranges
(IQ) were calculated for the mean of the numerical
variables. Confidence intervals (CI) for the proportion
of a characteristic were calculated with replacement
sampling or infinite population, with the significance
level at less than 0.05%. Statistics were performed
with software Info Stat™ version 2020. The
Institutional Review Board of CEMIC University
Hospital approved the study (CE 1045). 25 July 2016.

Results

Two hundred two women becoming pregnant after a
prior gestation complicated by PAS treated with con-
servative-resective surgery were included in the ana-
lysis. Among the different types of PAS according to
the classification provided by Palacios-Jaraquemada
et al., 89.6% (181/202) typed I, 7.9% (16/202) type II,
and 2.5% (5/202) type III. Two twin pregnancies were
not included in the primary analysis. (a) A 38-year-old
woman who became pregnant with IVF 22 months
after surgery for PAS. She had CS for fetal growth
restriction at 35.5 weeks of gestation and (b) a 28-
year-old woman who achieved pregnancy spontan-
eously 11 months after surgery for PAS, which was
also delivered at 35.5 weeks of gestation for fetal
growth restriction.

Maternal outcomes of patients previously operated
on PAS type 1: n: 179, the mean maternal age was
30 years (SD 4.18), the intergenesic period (IG) was
15 months -media (SD 4.76) (Q1: 12; Q3: 19), average
parity was 3 (SD 1.15) (Q1: 2; Q3: 4) max 8, min 2.
Complications: Premature rupture of membranes
(PPROM) 1, premature labor 4, hypertension 2, atony 1
(in twin pregnancy), overweight 1, gestational diabetes
1, firm bladder adhesion 1, myometrial thinning 1,
cerclage 1. Placental location: posterior 68% (95 CI:
67.8–68.3), fundal 26% (95 CI: 25.3–25.8) and anterior
2% (95 CI: 1.93--2.1). Two pregnancies ended by unin-
tended vaginal delivery.

Maternal outcomes of patients previously operated
on PAS type 2: n: 16 patients, mean
age was 31 years (SD 2.73) (Q1: 29; Q: 33), Max 37.
The intergensic period was 15 months – media
(SD 4.53) (Q1: 13.7; Q3: 19.5), Max 24, Min 10, average
parity was 2.34 (SD 0.82) (Q1: 2; Q3: 3) max 5, min 2.
Complications: Gestational diabetes, myometrial thin-
ing 1, hysterectomy 1 (maternal request). 81% of the
placentas were posterior (13/16) (95 CI: 80.3–81.6) and
three fundal. Maternal outcomes of patients previously operated
on PAS type 3: n: 5 patients, mean age was
36 years (SD 5.93) (Q1: 35 Q: 39), max 43, min 25. The
intergensic period was 18 months – media – (SD 6.56)
Complications: Gestational diabetes 1, use of assisted reproductive techniques 2. Neonatal outcomes of patients previously operated on PAS type 1, 2, and 3 included: (a) gestational age at the end of pregnancy, (b) average birth weight, (c) Apgar at 5 min and, (d) the mean percentile for gestational age are included in the Supplementary Addendum 1). 60% (3/5) of placentas was posterior (95 CI: 58.6–61.4) and 40% (2/5) (95 CI: 38.6–41.4) fun- dal. The upper segment preserved the integrity in all the cases, thicker than usual (Figure was included in the Supplementary Addendum 2). Two patients delivered by unintentional vaginal delivery were multiparas (3 and 4 vaginal deliveries and 2 CS, respectively) and entered an emergency room with baby crowning. Both preserve their uterus, but we have no further information.

Discussion

Main findings

The findings from this study showed that pregnancy outcome after a prior gestation complicated by PAS and treated with conservative-resective surgery is favorable in the large majority of cases. There was no uterine rupture, placenta previa, or need for hysterectomy due to severe maternal hemorrhage either before or during the CS.

The maternal and neonatal outcomes were similar to those with a cesarean related to the cesarean gestational age. The upper uterine segment aspect was regular or thicker than usual in standard cesarean, which is an indirect sign of adequate uterine healing [8] after PAS repair. The lack of rupture of the uterine scar may indicate good tensile properties; the only case of partial uterine dehiscence happens in twin pregnancy and remains asymptomatic until cesarean. According to the gestational age values [9], a previous uterine reconstructive procedure for PAS previous does not modify the maternal and neonatal outcomes, which is promissory to preserve a healthy reproductive function in all studied ages. The conceptional media time indicates that ovary and endometrial blood supply was not affected like other hemostatic methods [10]. During conservative-resective for PAS, the uterine and ovary vessels were never ligated or occluded; colpo-uterine vessels’ [11] occlusion performs vascular control of abnormal placenta.

Implications for clinical practice

After analyzing operative, maternal and neonatal outcomes, the conservative-resective procedure may preserve up to 80% of PAS cases with minimal morbidity and blood loss [4]. The use of custom hemostasis by pelvic fascia’s opening reduces a total operative time to one hour or one hand half. Neonate outcomes demonstrate that the procedure does not affect the results, probably because the main uterine and ovary blood supply arcade is not affected [12]. Despite this, it was necessary some time to evaluate new pregnancies in the repaired uterus, mainly because, during surgery, most of the uterine segment was removed. The secondary suture was performed in the upper segment, an area that is widely anastomosed and ensures optimal repair [13]. Healing was examined by image analysis six months after surgery [14], or when the patients recovered menses, those controls performed by MRI and 3 D color Doppler will be published soon. This data modifies the concept that hysterectomy [15] is the standard of care for PAS treatment. It was extensively proved that local resection is possible, reducing mutilation and extensive procedures with high morbidity. Uterine preservation has demonstrated wide acceptance for women; the average time for new pregnancy demonstrated the absence of anatomic or physiologic sequelae. After leaving the placenta in situ, the recurrence risk [16] is about 20%; its absence in the series of resective-conservative treatment is encouraging.

Research agenda

After confirmed that maternal and neonatal outcomes using resective-reconstructive in PAS have minimal complications [17] and additionally that normal subsequent pregnancy is possible, the next step is technique spread, although in healthcare research, results diffuse only slowly into clinical practice, and there is a need to bridge the gap between research and practice [18]. Although many specialists believe that this conservative-resective surgery for PAS needs a high grade of knowledge or training in pelvis vasculature, this is not true. Although a complete development of the technique needed decades, one of the main objectives was to achieve a reproducible and straightforward surgery. People and doctors habitually hang on to habits, believing that what has always been done will continue to work, even when evidence indicates otherwise [19]. Extensive studies are required to show that uterine repair for PAS is the optimal way to minimize
complications and preserve fertility without the risk of recurrence or serious complications.

Strengths and limitations
Details about the uterine segment’s state were directly observed by the authors or explained by direct dialog with the obstetrician who performs the cesarean. We have partial information for other cases, and although they were successful, we avoid to include here because we have not completed maternal and neonatal data or third persons received the information. The retrospective non-randomized design represents the main limitation of this study. Furthermore, almost all women were operated on by the authors or by obstetricians with close contact, thus reducing operators’ bias. Conversely, the retrospective design and heterogeneity in timing and indication to delivery represent the present study’s main limitations [15]

Conclusions
Normal pregnancy after conservative-resective for PAS is the epitome of the ideal result. Although PAS was associated with mothers with many children, it is also possible after a single cesarean or curettage. Reduce maternal complications with good neonatal results is a fantastic option for PAS, to preserve the uterus for uncomplicated fertility is also better.

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No potential conflict of interest was reported by the author(s).

ORCID
Jose. M. Palacios-Jaraquemada (http://orcid.org/0000-0002-5240-5320

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