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Article

Intermediate term outcome of conservative uterine surgery in women with placenta accreta spectrum

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Abstract. *Background*: The prevalence of the placenta accreta spectrum is increasing especially in mothers in their twenties and become at risk of losing their fertility at young age. Accordingly, there is an increase in the demand for conservation of the uterus especially in young age groups and determining the impact of conservation on their health. The aim of the study is to evaluate the intermediate term outcomes after one year from the uterine conservation surgery in women diagnosed with placenta accreta spectrum including the menstrual cycle, the prevalence of the isthmocele and the complications secondary to uterine conservation. *Design*: A pilot cross-sectional study carried out in El-Shatby university hospital (tertiary center hospital) in Egypt on 32 patients, who were diagnosed with placenta accreta spectrum and underwent uterine conservation surgery, whose age were between 20 to 40 years old. Menstrual cycle was evaluated. Greyscale and doppler ultrasound were performed to evaluate the isthmocele and the myometrium thickness. The primary outcome is to analyze the patients' menstruation and to evaluate the presence of the isthmocele. Data were analysed using SPSS software. *Results*: Menses was resumed in 81.3 % of the patients in the study; however, 18.7 % didn't have their menses. In addition, only one patient had an abnormal uterine bleeding in the form of post menstrual spotting in 3.1 %. Isthmocele was detected in 4 cases (12.5 %). It was observed in the anterior and posterior wall in 9.4 % and in the posterior only in 3.1 % of the patients in the study. *Conclusion*: Women were able to have a normal menstrual cycle; therefore, they had normal endometrial function. Isthmoceles were detected in new sites rather than where they are usually found. Posterior wall isthmocele should be evaluated after performing different uterine surgeries.

Keywords: Amenorrhea, Isthmocele, Morbid adherent placenta, Placenta accreta spectru

Introduction

Placenta accreta spectrum's (PAS) definitive management is hysterectomy (1). Therefore, the chance of investigating outcome after conservation of the uterus is very rare.
Different methods have been described leaving the placenta in situ or the expectant approach, removal of the invaded area and the Triple-P procedure. These methods can be applied alone or in combination with or without internal iliac artery occlusion. (2)
The aim of the study is to evaluate the intermediate term outcomes after one year from the uterine conservation surgery in women diagnosed with placenta accreta spectrum including the menstrual cycle, the prevalence of the isthmocele and the complications secondary to uterine conservation.

Patients and methods

This is a pilot single group cross-section study of women who underwent elective conservative surgery of the uterus due to PAS from May 2020 to April 2021 in El Shatby university hospital and have been recruited at least one year following the surgery. Patients, whose age were between 20 to 40 years old carried singleton Pregnancy with viable foetus and their gestational weeks were more than 35 weeks, have been included.
Patients who requested hysterectomy, had coexisting uterine pathology such as fibroids or gynaecological malignancies, bleeding diathesis, morbid obesity of body mass index >40, or had labour pains or vaginal bleeding required termination before scheduled intervention were excluded from the study.

After institutional review board approval and written informed consent, data was recorded which includes:

- Patients' age and body mass index
- Gravidity, parity and number of previous caesarean deliveries.
- Gestational age
- Medical and surgical history.

Detailed sonographic review was done to confirm the diagnosis of PAS.
Detailed surgical review was done to confirm uterine conservation surgery.

Primary outcome measures

In addition to evaluation of menstruation and menstrual abnormalities if present, breast feeding, and urinary symptoms were recorded.
Sonographic evaluation was done. Transabdominal and transvaginal ultrasound assessed the uterine wall, the cavity, and the cervix. The presence of isthmocele was assessed and it was recorded when its depth was more than or equal 2 mm.
In addition to its shape, the residual myometrium thickness and the ratio between residual myometrium and total myometrium thickness were measured and recorded. Residual myometrium thickness was defined as the distance from the apex of the isthmocele to the uterine serosa.
Moreover, intra-myometrium fibrosis, uterine volume and position were assessed.

Secondary outcome measures

Surgical diagnosis was recorded which depend on the FIGO classification on each surface of the uterus. (3) Total operation time was documented, and intraoperative complications were recorded. In addition, the estimated blood loss, the amount of blood transfused, haemoglobin and haematocrit before and after the operation were recorded.
Tubal sterilization was documented.

Statistical analysis

Qualitative data were described using number and percentage. Quantitative data were described using range (minimum and maximum) as well as interquartile range, mean, standard deviation and median. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Data were analysed using IBM SPSS software (version 20.0, Armonk, NY: IBM Corp).

Results

Thirty-two patients have been included in this pilot study. The mean age of the population in the study was 31.53 ± 4.98 with a median of 32.5. All the patients were multigravida with a mean of 4.66 ± 1.70 and multiparity with a mean of 2.88 ± 1.10.
The average gestational age at which they delivered was 37.06 ± 2.44. 37.5 % of the study population had undergone 2 caesarean sections, 4 caesarean sections (28.1 %), 3 caesarean sections (21.9 %) and one caesarean section (12.5 %). However, 46.9 % of study population had a previous miscarriage, only 9.4 % of the study population had an evacuation and curettage. 15.6 % of the population had operations outside the uterus such as appendectomy, cholecystectomy, salpingectomy, ovarian cystectomy and paraumbilical hernia repair.

The preoperative ultrasound diagnosis of the patients who were recruited into the study detected accreta in 3 cases, increta in 16 cases and percreta in 14 cases. Accreta, increta or percreta were not detected in 90.6 %, 50 % and 37.5 %, respectively.
Focal invasion was detected in 9 cases and partial invasion in 24 cases. In cases who were diagnosed as accreta 6.3 % were focal and 3.1 % were partial. In cases who were diagnosed as increta 3.1 % were focal and 46.9 % were partial. In cases who diagnosed as percreta 18.8 % were focal and 25 % were partial. Regarding the surgical diagnosis, increta was diagnosed in 28.1%, percreta in 40.6 %, accreta in 9.4 % and increta percreta was in 21.9 %.

The mean of the total operative time was 95.0 ± 32.28 minutes with a median of 95 minutes. The estimated blood loss mean was 1812.50 ± 981.69 ml with a median of 1500 ml. However, the mean of units of packed red blood cells transfused was 2.34 ± 1.56 units with a median of 2 units while the mean of fresh frozen plasma replaced was 2.34 ± 1.56 units with a median of 2 units. Internal iliac artery was ligated in 12.5 % only on both sides. Regarding to the complications, only 15.6 % had complications of which four (12.5 %) cases had an injury to the bladder and one (3.1 %) case had a surgical site infection. 21.9 % of the patients in the study had a red urine for 24 hours after the operation.

Patients were succeeded in breast feeding of their infants were 84.4 % of the populations studied however 15.6 % did not breast feed their infants. Patients who used a contraception were 93.8 % of the study population and only 6.3 % did not use any form of contraception. Tubal sterilization was done in 6.7 of patients who used a contraception, injections in 10%, combined pills in 26.7%, intrauterine device in 53.3 % and Implanon in 3.3% of them.

Fifty % of the patients had a parathesis noticed in the pelvic skin, which was persistent till the assessment day. Recurrent urinary tract infections were observed in 3.1 %, recurrent episodes of dysuria were observed and hematuria attacks in 37.5 % and 3.1 %, respectively.

Menses was resumed in 81.3 % of the patients in the study; however, 18.7 % didn't have their menses. The menstruation rhythm was regular in 65.6 % and irregular in 15.6 % of the patients who had their menses. Its amount was average in 65.4 %, above average in 26.9 %, below average in 3.8% and minimal in 3.8 % of the patients who had their menses. In addition, only one patient had an abnormal uterine bleeding in the form of post menstrual spotting in 3.1 %.

During the ultrasound assessment, isthmocele was detected in 4 cases (12.5 %). It was triangular in 9.4 % and U shaped in 12.5 % of the study population. It was observed in the anterior and posterior wall in 9.4 % and in the posterior only in 3.1 % of the patients in the study.

The mean length of the anterior wall isthmocele was 0.25 cm and its median was 0.36 cm while the mean of that of the posterior wall was 0.53 ± 0.07 cm and its median was 0.49 cm. the average depth of the anterior wall isthmocele 0.36 cm and its median was 0.36 cm while its posterior wall isthmocele mean depth was 0.35 ± 0.07 cm and its median was 0.38 cm.

The average length of the anterior wall total myometrium was 1.13 ± 0.36 cm, and its median was 1.02 cm while the average length of the total posterior wall myometrium was 1.45 ± 0.21 cm, and its median was 1.34 cm. The average length of the anterior residual (isthmic) myometrium was 0.59 ± 0.29 cm, and its median was 0.66 cm while the average length of the posterior residual (isthmic) myometrium was 1.17 ± 0.28 cm, and its median was 1.09 cm.

The mean of the endometrium thickness measured was 3.23 ± 3.22 mm with a median of 2 mm and its echogenicity was isoechoic, homogenous hyperechoic, homogenous hypoechoic and heterogenous in 43.8 %, 25 %, 6.3 % and 25 %, respectively. Intra-myometrium fibrosis was detected in 18.8 % and fluid was accumulated inside the cavity in 46.9 %. The uterus was anteverted anteflexed, retroverted retroflexed and erect in 84.4 %, 6.3 % and 9.4 %, respectively. Its volume mean was 149.68 ± 53.26 cm3 and its median was 142.11 cm3. The cervical length was measured, and its mean was 2.63 ± 0.55 cm with a median of 2.8 cm.

Table (1): Distribution of the studied cases according to the outcome after one year from the operation (n=32).

	No.	%
Breast feeding after one year		
No	5	15.6
Yes	27	84.4
Contraception	30	93.8
No	2	6.3
Yes	**30**	**93.8**
Tubal sterilization	2	6.7
Injections	3	10.0
Combined pills (COCS)	8	26.7
intrauterine device (IUD)	16	53.3
Implanon	1	3.3
Bladder complications		
None	18	56.3
Recurrent episodes of dysuria	12	37.5
Hematuria attacks	1	3.1
Urinary tract infection	1	3.1
Pelvic Skin		
Normal	16	50.0
Paresthesia	16	50.0

Table (2): Distribution of the studied cases according to menstruation analysis (n=32)

	No.	**%**
Menstruation resumption	6	18.8
No	**26**	**81.3**
Yes		
Menstruation rhythm	6	18.8
No	**21**	**65.6**
Regular	**5**	**15.6**
Irregular		
The Amount of menstruation (n = 26)	1	3.8
Minimal	17	65.4
Average	1	3.8
Below average	7	26.9
Above average		
Abnormal uterine bleeding (n = 26)		
No	25	78.12
Post menstrual spotting	1	3.1

Table (3): Distribution of the studied cases according to ultrasound after one year from the operation (n=32)

	No.	**%**
Isthmocele		
No	28	87.5
Yes	**4**	**12.5**
Site		
Posterior	1	3.1
Anterior and Posterior	**3**	**9.4**
Shape **Anterior (Triangular)** **posterior (U)**	3 4	9.4 12.5
Length Anterior (n=3)		
Min. – Max.	0.25 – 0.25	
Mean ± SD.	0.25 ± 0.0	
Median (IQR)	0.25	
Depth Anterior (n=3)		
Min. – Max.	0.36 – 0.36	
Mean ± SD.	0.36 ± 0.00	
Median	0.36	
Length Posterior (n=4)		
Min. – Max.	0.49 – .63	
Mean ± SD.	0.53 ± 0.07	
Median (IQR)	0.49 (0.49 – 0.56)	
Depth Posterior (n=4)		
Min. – Max.	0.25 – 0.38	
Mean ± SD.	0.35 ± 0.07	
Median (IQR)	0.38 (0.32 – 0.38)	

IQR: **Inter quartile range** SD: **Standard deviation**

Table (4): Distribution of the studied cases according to myometrium thickness (n=32).

	N	Min. – Max.	Mean ± SD.	Median (IQR)
Anterior total myometrium	**29#**	0.61 – 2.25	1.13 ± 0.36	1.02 (0.82 – 1.33)
Anterior residual (isthmus)	**30#**	0.17 – 1.04	0.59 ± 0.29	0.66 (0.25 – 0.83)
Posterior total myometrium	**17#**	1.19 – 1.85	1.45 ± 0.21	1.34 (1.34 – 1.61)
Posterior residual (isthmus)	**28#**	0.62 – 1.65	1.17 ± 0.28	1.09 (1.06 – 1.41)

#: Missed cases not assessed

IQR: **Inter quartile range** SD: **Standard deviation**

Discussion

This is a pilot study to evaluate the outcome of uterine conservation on the reproductive health of the women. It was done after one year from the operation to assess the menstruation and the prevalence of the isthmocele in these women. The menstruation was resumed in 81.3 %; therefore, they regained their reproductive function. This indicates that their endometrium and the cavity were restored in spite of severe degrees of placental invasion into the uterus. six (18.8 %) patients have secondary amenorrhea. However, five patients of them used IUD as a form of contraception, and one performed a tubal sterilization. The reasons for their secondary amenorrhea were assessed and only one of them was diagnosed with hypothyroid.

These results were different from that of Sentilhes et al. who carried out a retrospective study on women, whose uterus was conserved by leaving the placenta in situ. It was found that only 8 % had secondary amenorrhea which was justified that it was due to severe intrauterine adhesions. (4)

During ultrasound assessment, isthmocele and intra-myometrium fibrosis were noticed. The fluid accumulated inside the cavity helped to visualize these abnormalities clearly. These abnormalities were not only detected at anterior uterine wall but and posterior wall.

In best of our knowledge, this is the first time to detect and describe posterior wall isthmocele. Posterior isthmocele was defined as a pouch formed in the inner aspect of the posterior uterine wall with a depth of more than 2 mm. It can be triangular or U shaped (droplet) (figure 1).

The detection of both intra-myometrium fibrosis and isthmocele is consistent with study made by Al Naimi et al. who described four patterns of post cesarean section uterus according to the presence of intra-myometrium fibrosis and isthmocele.(5)

The isthmocele is one of the precursors of placenta accreta spectrum according to Jauniaux et al. (6) Therefore, it is crucial to evaluate its prevalence after uterine conservation to assess the recurrence risk of PAS.

It is recommended to continue the evaluation to check the relationship between the isthmocele and abnormal uterine bleeding in addition to the significance of the posterior wall isthmocele.

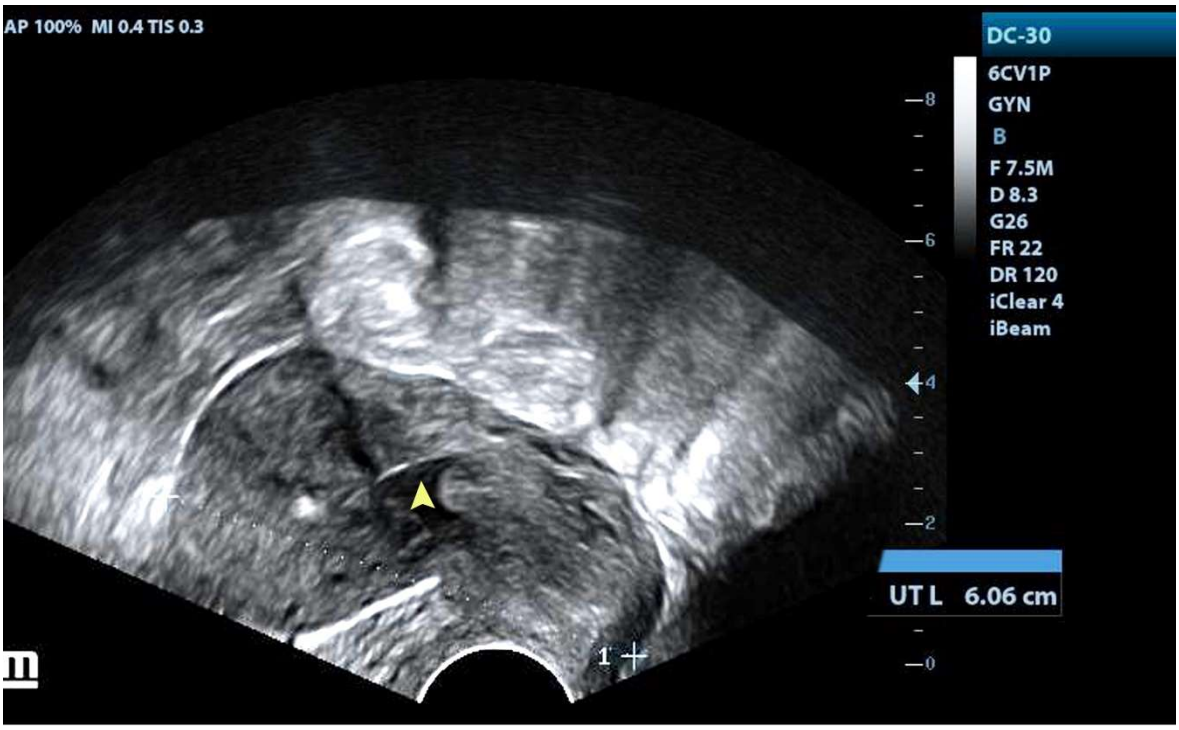

Figure 1: greyscale transvaginal image of the uterus showing a triangular posterior wall isthmocele (yellow arrowhea

Competing of interests

Authors report no conflict of interest.

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