Hysteroscopic Evaluation of Uterine Cavity after Conservative Management of Placenta Accreta

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Authors' contributions

This work was carried out in collaboration among all authors. Author MAS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SLE and AAE managed the analyses of the study. Author MMA managed the literature searches. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Background: Placenta accrete occurs when there is abnormal attachment of the placenta to the uterine wall either partially or totally. Placenta accreta had many complications mainly intraoperative and postpartum including injury to local organs (e.g. bowel, bladder, ureters) and neurovascular structures in the retroperitoneum. The aim of the present study was to evaluate the uterine cavity after conservative management of placenta accreta by using hysteroscope.
Materials and Methods: This is prospective study was carried on 40 pregnant at Tanta University Hospital with age >35 years, to detect Presence or absence of intra uterine changes after conservative management of placenta accrete by hysteroscopy, easiness of performing diagnostic hysteroscopy and Correlation between intrauterine changes and operative data.
Results: Hysteroscopic examination of the participants showed that 30.0% with incidences of Cervical stenosis, 15.0% with uterine cavity irregularity, 15.0% with intrauterine adhesions, 10.0% with endometrial fibrosis, 5.0% with scar dehiscence and 5.0% with Remnant. There was a statistically significant positive correlation between development of cervical stenosis and endometrial thickness by US (correlation coefficient r = 0.323 with p value 0.042) .There was a statistically significant negative correlation between Endometrial fibrosis and scar thickness

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(correlation coefficient r = -0.538 with p value <0.001). There was a statistically significant negative correlation between Intra uterine adhesions and scar thickness (correlation coefficient r = -0.470 with p value 0.002). There was a statistically significant negative correlation between uterine cavity irregularity and duration of CS (correlation coefficient r = -0.320 with p value 0.044).
Conclusion: The frequency of abnormal hysteroscopic findings after conservative management of placenta accreta is high, for at least several months after the procedure. The most frequently found abnormalities, associated with conservative treatment, are cervical stenosis, uterine cavity irregularity and Intrauterine adhesions.

1. INTRODUCTION

Placenta accrete occurs when there is abnormal attachment of the placenta to the uterine wall either partially or totally. Three grades of abnormal placental attachment are defined according to the depth of attachment and invasion into the muscular layers of the uterus [1].

The antepartum diagnosis of placenta accreta is suspected, usually based on ultrasound findings in the second or third trimester. Sonographic findings that may be suggestive of placenta accreta include: Loss of normal hypo echo icretro placental zone, Multiple vascular lacunae (irregular vascular spaces) within placenta, giving "Swiss cheese" appearance, Blood vessels or placental tissue bridging uterine-placental margin, myometrial-bladder interface, or crossing the uterine serosa,, Retroplacental myometrial thickness of <1 mm [2]. Placenta accreta had many complications mainly intraoperative and postpartum including injury to local organs (e.g. bowel, bladder, ureters) and neurovascular structures in the retroperitoneum and lateral pelvic sidewalls from placental implantation and its removal; Postoperative bleeding requiring repeated surgery; Amniotic fluid embolism, dilutional coagulopathy and consumptive coagulopathy [3].

Many maneuvers were tried to conserve the uterus in a trial for preserving female infertility including: Leaving the placenta in the uterus and curettage of uterus. Methotrexate has been used in this case [4] Intrauterine balloon catheterization to compress blood vessels, Embolization of pelvic vessels [5], Internal iliac artery ligation, bilateral uterine artery ligation , excision of lower uterine segment, If the area of accreta is focal and the majority of the placenta has been removed, then a wedge resection of the area can be performed. The myometrium is subsequently overseen in two layers [6].

The aim of the present study was to evaluate the uterine cavity after conservative management of placenta accreta by using hysteroscope.

2. SUBJECTS AND METHODS

This is prospective cohort study was carried on 40 pregnant selected from inpatient and outpatient clinic at Tanta University Hospital,the duration of the study from January/2019 to may/2020. Inclusion criteria: Female with history of conservative management of placenta accrete in last 3 to 6 months And the patients were be excluded according to the following Exclusion criteria: Patient refusion, Complicated conservative (re-surgery), closure of the cervix by randomized sutures, surgical data of the conservative operation is not recorded or obscured.

This study was be carried out without any external funds. There was no classification of the patients according to their religion nor culture nor race nor any other unrelated points in that study.

After selection of cases written informed consent was done for patients about hazards and benefits of the study. Full history taking from the patients including obstetric history. Surgical details of the last cesarean section. Examination including general and local examination with stress on: Size of uterus by bimanual examination and Mobility of the uterus. Investigations either non-invasive as Routine medical laboratory investigations needed preoperative including (CBC,PT,APTT,ABO), Ultrasonography done preoperative (by Mindray DC 30 trans abdominal and transvaginal) to the patient for observing: Size of the uterus, Cavity of the uterus, Adenexia, Presence of blood and Integrity of scar (The normal lower uterine segment was seen juxtaposed to the bladder. Measurements were taken at multiple sites (3–4) of the lower uterine segment and its thinnest portion was considered to be the scar.). While invasive investigations as

diagnostic hysteroscopy for Patients underwent diagnostic hysteroscopy 3-6 months postpartum, it was done postmenstrual if she was a menstruating female and after excluding pregnancy if she was amenorrhea, hysteroscopy was done according to standard techniques: hysteroscopic examination was performed as inpatient procedure at the follicular phase under general endotracheal anesthesia.

- Monitor: SONY (non-medical), AC 100-270 V to display and videotape the hysteroscopic events.
- Fibroptic light cable: Xenon nova, model 20 13 15 20 manufactured by Storz.
- Camera: Karl Storz-endoscope, telecom DXpal model 20 23 20 20 by Storz.
- Hysteroscopic equipment (Trophoscopic Karl Storz, Tuttlingen, Germany telescope: rigid, 30∘ Hamou II hysteroscope, model 26157 BT, with a Hopkins II lens system. The sheath has a 4 mm outer diameter.
- Distention media: normal saline.

After explanation of the procedure the patient was asked to empty her bladder. The patient was lying in the lithotomy position. Normal saline was used as a distention media for uterine distension connected to the inflow channel on the sheath. A vaginal disinfection with povidine iodine 10% without placing speculum was done. The tip of the hysteroscope was positioned in the vaginal introitus, the labia being slightly separated with fingers. The vagina was distended with saline. The scope was driven to the posterior fornix to readily visualize the portio and slowly backwards anterior to identify the external cervical os. When this became visible, the scope was carefully moved forward to the internal os and then to the uterine cavity with least possible trauma. The uterine cavity was systematically explored in a panoramic view by rotating the fore-oblique scope in order to identify any anomaly in the uterine walls and the right and left tubal ostia and the following data is recorded as:

a) Cervical status as stenosed or not (the cervical canal varies greatly in length and width between women or over the course of a woman's life, and it can measure 8 mm (0.3 inch) at its widest diameter in premenopausal adults. b) Size of uterus and uterine cavity c) Regularity of uterine cavity (if there were elevaions and depresions or not) d   Intra uterine adhesions (Three types of intrauterine adhesions were identified at x 20 magnification: (1) Endometrial adhesions appeared white, with some glandular

and vascular patterns similar to those in the surrounding endometrium. They were easily dissected. (2) Synechiae composed mostly of fibrous or connective tissue appeared transparent, thin, bridge-like, and poorly vascularized and formed stumps after lysis; usually they were central or isthmic. (3) Myometrial adhesions, limiting uterine distension, were highly vascular, extensive, and required general anesthesia for their lysis e) Endometrial fibrosis f) Integrity of scar there were scar defect or not . Finally, data were collected in specialized confidential files for patients and statistical analysis were done.

2.1 Statistical Analysis

The sample size was calculated using Epi-Info software statistical package created by World Health organization and center for Disease Control and Prevention, Atlanta, Georgia, USA version 2002. The criteria used for sample size calculation (n>33) were 95% confidence limit, 80% power of the study.

Analysis of data were performed by SPSS v25 (SPSS Inc., Chicago, IL, USA). Quantitative parametric variables (e.g. age) were presented as mean and standard deviation (SD). Pearson's rho coefficient of correlation (r) was used to calculate the degree of correlation between 2 variables. P value < 0.05 was considered significant.

3. RESULTS

As regards demographic data, mean 26.13 with (SD) (4.36) years of age of the current study population. The mean BMI was 30.09 with (SD) (2.10). Most cases were housewives (62.5%) and from rural areas (72.5%) Table 1.

According to the operative details of the studied sample, the mean 102.38 and (SD) (28.62) of the duration of CS in minutes, the mean 2505.0 and (SD) (854.76) of the intraoperative blood loss in (ml) and only two cases complicated with Postpartum hemorrhage Table 2. Local uterine examination of the studied sample in the current study showed only 2 cases with tender uterus and five immobile uterus Table 3.

As regards the ultrasonographic examination of the studied sample in the current study, the mean 8.19 (cm) and (SD) (0.70) of the size of the uterus, the mean 4.95 and (SD) (1.30) of the endometrium thickness (mm) and the mean 3.11

and (SD) (0.46) of the Scar thickness by US (mm). Fig. 1. As regards, hysteroscopic examination of the participants showed that 30.0% with incidences of Cervical stenosis, 15.0% with uterine cavity irregularity, 15.0% with intrauterine adhesions, 10.0% with endometrial fibrosis, 5.0% with scar dehiscence and 5.0% with Remnant Table 4.

There was a statistically significant positive correlation between development of cervical stenosis and endometrial thickness by US (correlation coefficient r = 0.3 with p value 0.042) while there was non statistically significant positive correlation with other quantitative as Age and size of uterus with (p value= 0.846 and 0.730 respectively) Fig. 2. There was a statistically significant negative correlation between uterine cavity irregularity and duration of CS (correlation coefficient r = -0.320 with p value 0.044) while there was non statistically significant positive correlation with other quantitative variables. Fig. 3. There was a statistically significant negative correlation between Intra uterine adhesions and scar thickness (correlation coefficient r = -0.470 with p value 0.002) while there was non-statistically significant negative correlation with other quantitative variables with (p value= 0.329, 0.929, 0.091, 0.787 and 0.569 respectively). Fig. 4. There was a statistically significant negative correlation between Endometrial fibrosis and scar thickness (correlation coefficient r = -0.538 with p value <0.001) while there was non-statistically significant negative correlation with

others with (p value= 0.060, 0.770, 0.121, 0.619, 0.0482 and 0.750 respectively) Fig. 5.

4. DISCUSSION

These results are in same way of a prior study by Abd-Elghany et al. who evaluated the perioperative maternal outcomes of bilateral internal iliac artery ligation in morbidly adherent placenta previa in 30 women with mean (SD) duration of CS (minutes) of 97.44 (16.07), the mean (SD) intraoperative blood loss (ml) was 2153.75 (725.64) [7].

Also, a prior case report by Greenberg and colleague assessed uterine artery embolization and hysteroscopic resection to treat retained placenta accreta in a A 40-year-old primigravida. During her routine postpartum visit at 6 weeks, the patient reported persistent vaginal bleeding with occasional heavy episodes [8].

Conventional two-dimensional ultrasonography is useful in screening for placenta accreta, with both sensitivity and specificity over 90%, and a negative predictive value of 98%.

As regards the ultrasonographic examination of the studied sample in the current study, the mean 8.19 (cm) and (SD) (0.70) of the size of the uterus, the mean 4.95 and (SD) (1.30) of the endometrium thickness (mm) and the mean 3.11 and (SD) (0.46) of the Scar thickness by US (mm) [9].

Table 1. Demographic characters of the studied sample

All patients (n= 40)		Mean & SD	Median	Range
Age (years)		26.13 ± 4.36	26.00	18- 37
BMI (kg/m^2)		30.09 ± 2.10	29.83	27- 34
Occupation	Housewife	62.5% (25)		
	employee	37.5% (15)		
Residency	Urban	27.5% (11)		
	Rural	72.5% (29)		

Table 2. Operative details of the studied sample

All patients (n= 40)	Mean & SD	Median	Range
Duration of CS (minutes)	102.38 ± 28.62	107.50	55 - 145
Intraoperative blood loss (ml)	2505.0 ± 854.7	2550	900 -3850
Post-partum hemorrhage	5% (2)		

Table 3. Local uterine examination of the studied sample

	All patients (n= 40)
Immobile uterus	15.0% (6)
Mobile uterus	85.0% (36)
Tender uterus	5.0% (2)
Non tender uterus	95.0% (38)

Table 4. Results of hysteroscopic examination in the studied sample

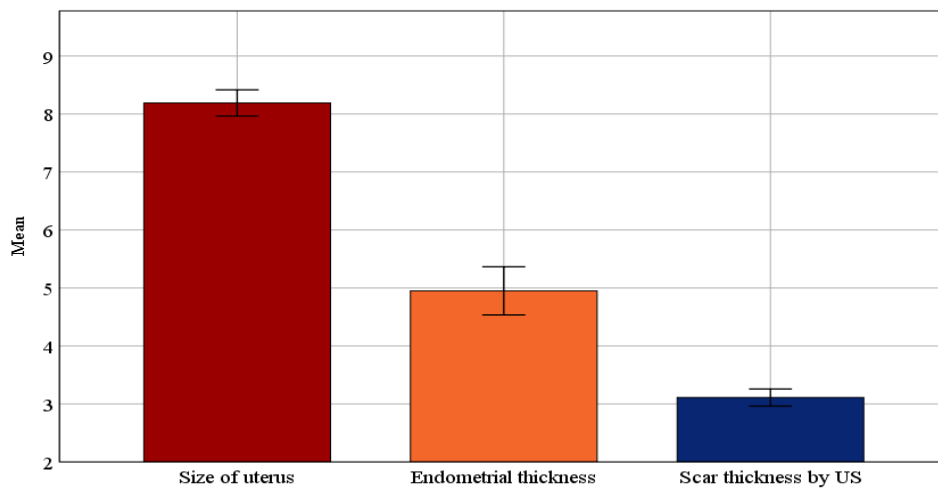|	All patients (n= 40)
Cervical stenosis	30.0% (12)
Uterine cavity irregularity	15.0% (6)
Intra uterine adhesions	15.0% (6)
Endometrial fibrosis	10.0% (4)
Scar dehiscence	5.0% (2)
Remnant	5.0% (2)

Fig. 1. Ultrasonic examination of the studied sample
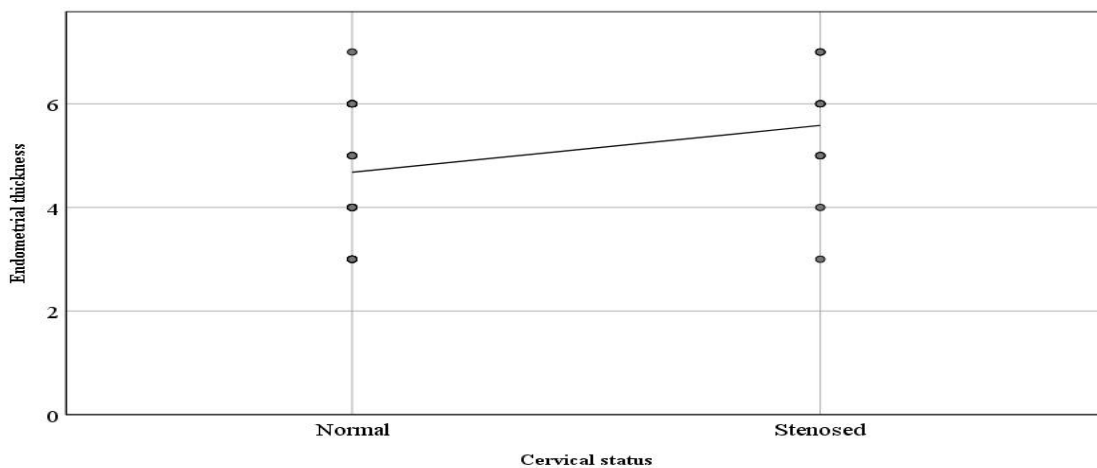

Fig. 2. Correlation between development of cervical stenosis and endometrial thickness
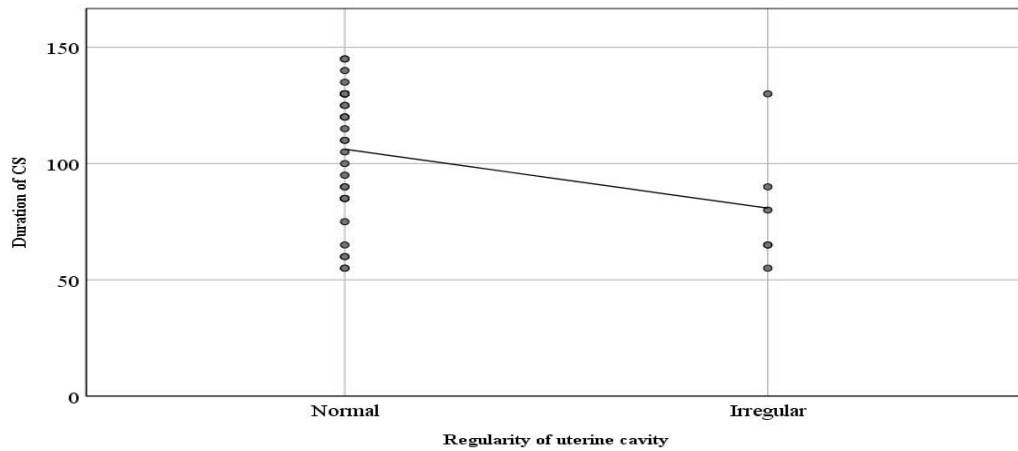
Fig. 3. Correlation between development of uterine cavity irregularity and duration of CS in the current study
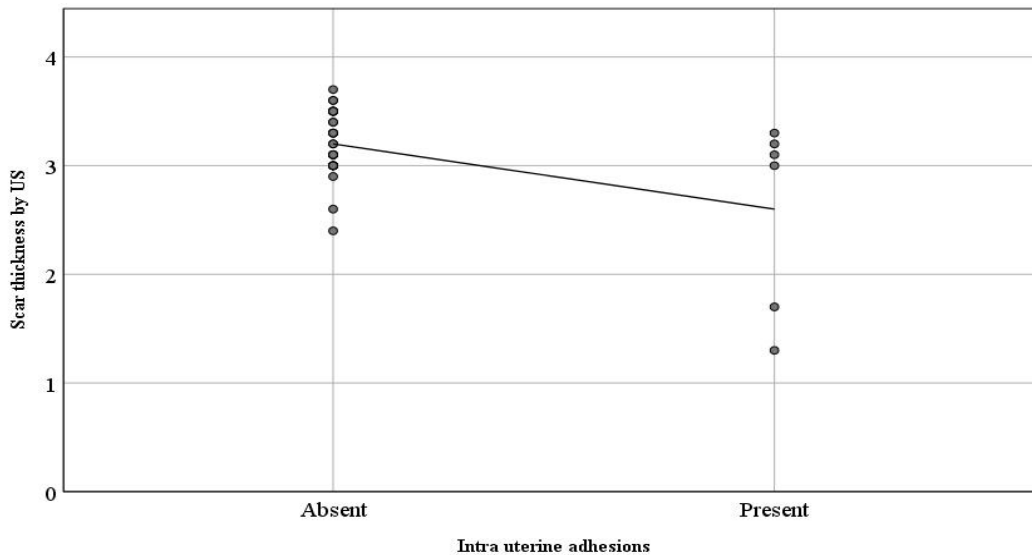

Fig. 4. Correlation between development of Intra uterine adhesions and scar thickness by US in the current study

These findings go parallel with a previous case report by Greenberg and his colleague who assessed uterine artery embolization and hysteroscopic resection to treat retained placenta accreta in a A 40-year-old primigravida. During her routine postpartum visit at 6 weeks, an ultrasound revealed a 3×3.5-cm hypoechoic, hypervascular mass with possible myometrial invasion consistent with retained placental tissue. To better delineate the findings, an MRI of the uterus was performed, and it confirmed a vascular lesion with marked thinning of the adjacent myometrium but without extension through the serosa [10].

Also, in a previous case report by Yee and his colleague who reported a case of a 32-year-old woman, gravida 2, para 1 with conservative treatment of placenta previa totalis, ultrasonographic examination on the 164th postoperative day showed that the placenta had completely regressed [11].

In accordance with these findings, another case report by Ferrazzani and his colleague who reported a case of a 26-year-old woman had pregnancy complicated by placenta previa with suspected accreta. During elective cesarean section a prophylactic double bilateral ligation of

uterine arteries was performed. A transabdominal and transvaginal ultrasonography examination performed 2 months later showed normal uterine and cervical shape and biometry; color and power Doppler analysis documented a renewed vascular tree at the level of the uterine cervix and corpus [12].

A prior study by Donnez et al. who examined three patients underwent cesarean section and presented with symptomatic dehiscence at the level of the incision trying to conceive for >1 year. ultrasound revealed that the thickness of the residual myometrium of the anterior uterine wall was <1mm m in the first two cases and was 2.1 mm in the last case. Hysteroscopy allowed us to visualize the dehiscence of the cesarean scar running along the whole breadth of the anterior uterine wall Chocolate liquid was visible in the scar, highly suggestive of retention of old menstrual blood [13].

Another previous study by Hequet et al., 2013 who assessed the safety of hysteroscopic resection in women presenting with severe pelvic pain and chronic intrauterine retention after conservative treatment of placenta accreta. After a mean follow-up period of 209 days, the volume of uterine retention products had regularly decreased as evidenced by ultrasonographic follow-up since the immediate post delivery period, in combination with the disappearance of placental vascularisation at duplex Doppler examination. In all women, an arrest of the decrease in the uterine-retained products had been noted for at least one month. In all women, placental retained products displayed a hyperechogenic pattern with intra-uterine calcifications [14].

Also, in a previous case report by Yee et al. [11] who reported a case of a A 32-year-old woman, gravida 2, para 1 with conservative treatment of placenta previa totalis, 2 months after normalization of the uterus, hysteroscopy revealed sclerotic changes and local fibrosis of the lower segment of the uterus [15].

In the same way, another previous study by Hequet et al. of 15 women with conservative treatment, four presented with severe pelvic pain and chronic intrauterine retention during the post delivery follow-up period. Hysteroscope (A bipolar resectoscope) was performed in the four women, the intrauterine retained products displayed a macroscopic pattern very similar to osseous metaplasia and were gently removed [16].

These findings go parallel with a prior case report by Chikazawa et al. who detected Asherman's syndrome after conservative management of placenta accreta by a balloon inserted into her uterine cavity. On postoperative day 3, the balloon was removed and there was no active bleeding. Four months postoperatively, hysteroscopy was performed and adhesion was detected at the fundus of her uterus, in the location of the placenta accreta. Asherman's syndrome was diagnosed [17].

Furthermore, another study was parallel to the current study by Feng et al. who retrospectively analyzed.Sixty-two patients with postcesarean scar defects diagnosed using ultrasonography and hysteroscopy underwent hysteroscopic surgery, and were followed up for longer than 1 year and found that among the 62 postcesarean scar defects, hysteroscopic examination of dome-like defects revealed that 38 patients had valve-like motion at the incision site, with chronic blood clots in the defects. Blind spots were found under microscopic examination in most patients because the defect was deep [18].

Moreover, a prior study by et al., who aimed at evaluating the outcome of the cesarean scar, comparing two different types of single-layer sutures by transvaginal ultrasound and hysteroscopy and found that At hysteroscopy at 24 months, the cesarean pouch appeared mainly fibrotic (22 cases), hypertrophic, with small endometrial polyps (six cases), or showed signs of superficial neovascularization with vessel dilatation (four cases). Growth of endometrium on the internal surface of the scar was detected in 10 cases [19].

In contrary to us, a previous study by Feng et al. who retrospectively analyzed.Sixty-two patients with postcesarean scar defects diagnosed using ultrasonography and hysteroscopy, found that all patients had a normal uterine cavity and endometrium, without any intrauterine vegetation. The cesarean section scars with dome-like defects could be clearly observed in all patients, and the depth of the defects was 3.8 (1.2) cm [20].

El-Mazny and his colleague assessed seventy-five women with previous CS(s), complaining of infertility, menstrual disorders or recurrent pregnancy loss for the assessment of the uterine

cavity in women with previous cesarean section (CS) and found that the mean thickness of the scar as detected was 7.1 ± 2.3 SD. Unhealthy scar was detected in 34 cases (45.3%) at diagnostic hysteroscopy. Scar defect was detected in 20 cases (26.7%) at sonohysterography and in 23 cases (30.7%) at diagnostic hysteroscopy, whereas intrauterine adhesions were detected in 22 cases (29.3%) at sonohysterography and in 29 cases (38.7%) at diagnostic hysteroscopy [21]. We recommended that to do more studies with large number and more duration for follow up for evaluation of patient fertility after conservative management of placenta accrete also evaluate pregnancy outcome after placenta accrete .

5. CONCLUSION

It can be concluded that the frequency of abnormal hysteroscopic findings after conservative management of placenta accreta is high, for at least several months after the procedure. The most frequently found abnormalities, associated with conservative treatment, are cervical stenosis, uterine cavity irregularity and Intrauterine adhesions

CONSENT

A written consent were obtained and signed by the patient

ETHICAL APPROVAL

All patients submitted to the study were counseled thoroughly about the procedure including its value and hazards, with official permission of hospital and the aim of the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Timor-Tritsch IE, Monteagudo A, Cali G, Vintzileos A, Viscarello R, Al-Khan A, et al. Cesarean scar pregnancy is a precursor of morbidly adherent placenta. Ultrasound in Obstetrics & Gynecology. 2014;44(3):346-353.
2. Jauniaux E, Collins SL, Jurkovic D, Burton GJ. Accreta placentation: A systematic review of prenatal ultrasound imaging and grading of villous invasiveness. Am J Obstet Gynecol. 2016;215(6):712-721.
3. Papanikolaou IG, Domali E, Daskalakis G, Theodora M, Telaki E, Drakakis P, et al. Abnormal placentation: Current evidence and review of the literature. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2018;(228):98-105.
4. Usta IM, Hobeika EM, Musa AAA, Gabriel GE, Nassar AH. Placenta previa-accreta: risk factors and complications. American Journal of Obstetrics and Gynecology. 2005;193(3):1045-1049.
5. Oyelese Y, Smulian JC. Placenta previa, placenta accreta, and vasa previa. Obstetrics & Gynecology. 2006;107(4): 927-941.
6. Elhawary TM, Dabees NL, Youssef MA. Diagnostic value of ultrasonography and magnetic resonance imaging in pregnant women at risk for placenta accreta. The Journal Of Maternal-Fetal & Neonatal Medicine. 2013;26(14):1443-1449.
7. Al-Khan A, Gupta V, Illsley NP, Mannion C, Koenig C, Bogomol A, et al. Maternal and fetal outcomes in placenta accreta after institution of team-managed care. Reproductive Sciences. 2014;21(6):761-771.
8. Bretelle F, Courbière B, Mazouni C, Agostini A, Cravello L, Boubli L, et al. Management of placenta accreta: Morbidity and outcome. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2007;133(1):34-39.
9. Descargues G, Douvrin F, Degré S, Lemoine JP, Marpeau Lc, Clavier E. Abnormal placentation and selective embolization of the uterine arteries. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2001;99(1):47-52.
10. Soyer P, Morel O, Fargeaudou Y, Sirol M, Staub F, Boudiaf M, et al. Value of pelvic embolization in the management of severe postpartum hemorrhage due to placenta accreta, increta or percreta. European Journal of Radiology. 2011;80(3):729-735.
11. Yee Y-H, Kung F-T, Yu P-C, Hsu T-Y, Cheng Y-F. Successful conservative management of placenta previa totalis and extensive percreta. Taiwanese Journal of Obstetrics and Gynecology. 2008;47(4): 431-434.
12. Collins SL, Alemdar B, van Beekhuizen HJ, Bertholdt C, Braun T, et al. International society for abnormally

invasive P. Evidence-based guidelines for the management of abnormally invasive placenta: Recommendations from the international society for abnormally invasive placenta. Am J Obstet Gynecol. 2019;220(6):511-526.

13. Sentilhes L, Kayem G, Chandraharan E, Palacios-Jaraquemada J, Jauniaux E. Figo consensus guidelines on placenta accreta spectrum disorders: Conservative management. International Journal of Gynecology & Obstetrics. 2018;140(3): 291-298.

14. Red-Horse K, Zhou Y, Genbacev O, Prakobphol A, Foulk R, McMaster M, et al. Trophoblast differentiation during embryo implantation and formation of the maternal-fetal interface. The Journal of Clinical Investigation. 2004;114(6):744-754.

15. James J, Carter AM, Chamley L. Human placentation from nidation to 5 weeks of gestation. Part I: What do we know about formative placental development following implantation?. Placenta. 2012;33(5):327-334.

16. Gude NM, Roberts CT, Kalionis B, King RG. Growth and function of the normal human placenta. Thrombosis Research. 2004;114(5-6):397-407.

17. Tantbirojn P, Crum C, Parast M. Pathophysiology of placenta creta: The role of decidua and extravillous trophoblast. Placenta. 2008;29(7):639-645.

18. Tarrade A, Kuen RL, Malassiné A, Tricottet V, Blain P, Vidaud M, et al. Characterization of human villous and extravillous trophoblasts isolated from first trimester placenta. Laboratory Investigation. 2001;81(9):1199-1211.

19. Kingdom J, Huppertz B, Seaward G, Kaufmann P. Development of the placental villous tree and its consequences for fetal growth. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2000;92(1):35-43.

20. Lagalla C, Barberi M, Orlando G, Sciajno R, Bonu MA, Borini A. A quantitative approach to blastocyst quality evaluation: Morphometric analysis and related IVF outcomes. Journal of Assisted Reproduction and Genetics. 2015;32(5): 705-712.

21. Genbačev O, Vićovac L, Larocque N. The role of chorionic cytotrophoblasts in the smooth chorion fusion with parietal decidua. Placenta. 2015;36(7):716-722.

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