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Case Series

Obstetrics and Gynaecology Section

Placenta Accreta Spectrum Disorders, a Formidable Challenge of Contemporary Obstetrics: A Case Series and Brief Review

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ABSTRACT

The prevalence of Placenta Accretea Spectrum disorders (PAS) is rising as a result of increasing caesarean section rates. PAS is considered high risk because of severe maternal morbidity and mortality associated with it. A peripartum hysterectomy is required leading to loss of future fertility. The knowledge and awareness of clinical risk factors, associated with possibility of PAS, is essential for antenatal diagnosis and optimum planning to reduce maternal morbidity. The purpose of present case series was to evaluate the risk factors, the circumstances and modality of diagnosis, clinical course, mode of management, and clinical outcome in six cases of PAS identified at a tertiary care centre, over a period of 18 months from February 2019 to August 2020. All the patients had histological confirmation of PAS. The most common risk factors observed were previous caesarean in 5 (83.33%) cases, concomitant placenta previa in 5 (83.33%), multiparity in 5 (83.33%), and increased maternal age in 4 (66.66%) cases. Ultrasound imaging was the imaging modality of choice, but missed diagnosis in two cases. Obstetric haemorrhage was the most common complication observed in 5 (83.33%) of cases. The primary mode of management was caesarean delivery followed by hysterectomy. The initiatives such as, Trial Of Labour After Caesarean (TOLAC) and External Cephalic Version (ECV) in primi breech can help reduce caesarean rates, and thus incidence of PAS. A knowledge of high risk factors and antenatal imaging expertise can help in timely diagnosis of PAS. A good outcome is dependent on early antenatal diagnosis, preparation for delivery and postpartum care. The management should involve a multidisciplinary team.

Keywords: Caesarean delivery, Caesarean hysterectomy, Postpartum haemorrhage

INTRODUCTION

The term “Placenta Accreta” (PA) was first described by Irving FC and Hertig AT in 1937 [1]. The rising caesarean rate in last couple of decades has led to an increased incidence of PAS disorders [2,3]. A study in year 2011 predicted, that escalating caesarean delivery rate will lead to an additional 4504 cases of PAS disorders by 2020 [4].

The PA is invasion of chorionic villi into the myometrium through a defect in deciduas basalis. PA is classified on the basis of depth of myometrial invasion. The recent guidelines now consider three categories for PAS disorders:

(1) PA vera, the villi are attached to the myometrium but without any myometrial invasion;

(2) Placenta increta, characterised by partial invasion of myometrium by the villi;

(3) Placenta percreta, in which villi penetrates through the entire myometrial thickness involving serosa and occasionally adjacent pelvic organs [5].

The clinical consequence of PA is massive haemorrhage at the time of placental separation, requiring large transfusions. A hysterectomy is often required leading to serious comorbidities such as intraoperative hypotension, urinary tract injury (22.2%) and longer hospital stay [6,7].

The diagnosis of PAS needs to be made in the antenatal period so that a management plan can be in place to achieve a better maternal outcome. An antenatal transabdominal Ultrasonography (US) remains the mainstay of diagnosis for PAS. Various US features have been documented to be associated with a higher risk of placenta accrete [8,9]. Magnetic Resonance Imaging (MRI) is another imaging modality which can aid in diagnosis of PAS. The MRI findings of heterogenous placenta, dark intraplacental bands, bulge in the uterus, anomalous disordered vascularity in placenta, tenting in area of urinary bladder, regions of focal interruption of the myometrium suggest PAS [10].

The conclusive diagnosis of a PAS is made on the basis of histopathologic examination, with chorionic villi seen directly adjacent to or invading myometrial fibres along with a partial or complete absence of decidua basalis. A recent report proposed that the attachment of myometrial fibres to the placental basal plate on histopathology can be associated with an increased risk of morbidly adherent placenta in a future pregnancy [11].

CASE SERIES

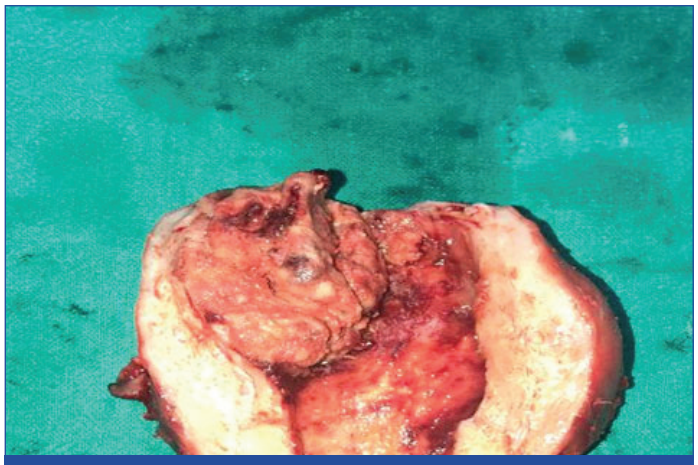
All the six cases with diagnosis of PAS, spread over a period of 18 months from February 2019 to August 2020, managed at M.M. Institute of Medical Sciences and Research Hospital, Mullana, India, tertiary care centre were studied in detail. The diagnosis of PAS was suspected clinically and confirmed radiologically (US and/MRI) as well as histologically. The data regarding risk factors like maternal age, parity, prior caesarean section, concurrent placenta previa, history of uterine curettage or other uterine surgical procedures was extracted. The clinical profile in the present pregnancy including any co-morbidities (anaemia, Hypertensive Disorders of Pregnancy (HDP), Gestational Diabetes Mellitus (GDM)), if any was noted. The primary management approach was caesarean hysterectomy. The gestational age at delivery, anaesthesia given and complications like haemorrhage, urinary tract injury, sepsis and ICU stay were recorded. The amount of blood loss was extracted from operative notes, along with number of blood products used within 24 hours of surgery. The perinatal outcome was studied. Intraoperative photographs were retrieved from the database of present department. Ethical clearance was taken from Institutional Authority (IEC-158P) and informed consent was obtained from the respective patients.

CASE 1

A 24-year-old, P2L1 was referred to M.M. Institute of Medical Sciences and Research Hospital, Mullana, institute at postnatal day 21 of live term vaginal birth followed by manual removal of placenta.

Patient had secondary Postpartum Haemorrhage (PPH) on Postnatal day-five for which she received one unit of Packed Red Blood Cell (PRBC), but she continued to have intermittent bleeding episodes.

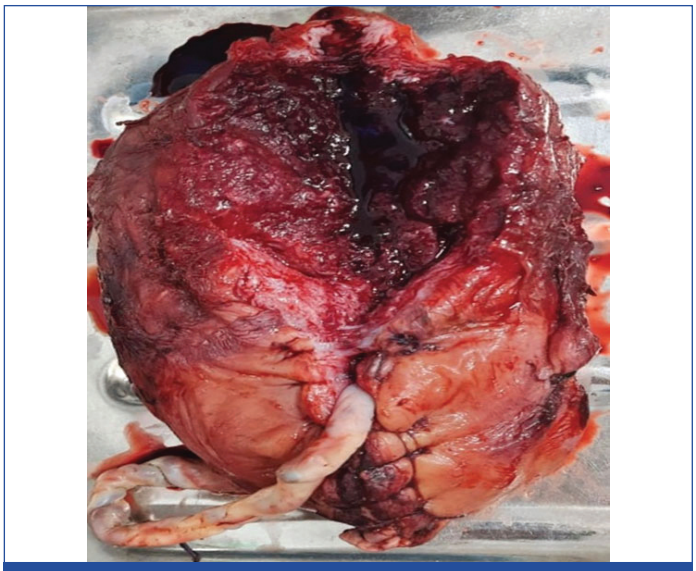
Obstetric history: Para 1: 1.5 years back, vaginal delivery, Intrauterine Foetal Death (IUFD) of unknown aetiology at six months gestation. On admission examination; patient was conscious, pale, BP-120/80 mmHg, Pulse rate- 102/minute and afebrile. On the per speculum (P/S) examination: no active bleed, PV (per vaginum) examination: uterus 10 weeks size, firm and no adnexal mass. All relevant investigations were done including, blood grouping, complete haemogram, coagulation profile, C-Reactive Protein (CRP), liver and kidney function tests, urine routine and microscopy, Haemoglobin (Hb) was 9.1 gm/dL. A provisional diagnosis of retained placenta with possibility of accreta was made, but the US showed retained placenta measuring 4.8×2.8 cm, with no evidence of accreta. The patient was kept on conservative management (leaving placenta in situ) which involved blood transfusion and antibiotics, strict vitals monitoring but patient developed sepsis after five days. In view of sepsis, surgical intervention was undertaken but placenta could not be extracted out vaginally, and patient started bleeding profusely. A laparotomy was performed under General Anaesthesia (GA) followed by total abdominal hysterectomy [Table/Fig-1]. The blood loss was 1.4 L, two units of blood and two Fresh Frozen Plasma (FFP) was transfused. The postoperative period was uneventful. The Histopathological Examination (HPE) showed PA vera.



[Table/Fig-1]: Hysterectomy specimen showing Placenta Accreta (PA) in upper segment.

CASE 2

The patient was 34-year-old with obstetric history: G5P3L2A1; Para 1: Lower Segment Cesarian Section (LSCS) performed 11 years back for severe pre-eclampsia; Para 2: was IUFD delivered via Vaginal Birth After Caesarean delivery (VBAC) eight years back; Para 3: was LSCS done seven years back for abruptio placentae at eight months of gestation, she had one spontaneous abortion followed by Dilatation and Curettage (D&C) four years back at four months of gestation. She presented to the Outpatient Department (OPD) in stable condition with diagnosis of 35 weeks pregnancy in transverse lie with anterior placenta previa. The uterus corresponded to 36 weeks, with no scar tenderness and cephalic presentation. All baseline investigations were done, the Hb was 11 gm/dL, with deranged sugar profile. A diagnosis of GDM was made, glucose monitoring done, and insulin therapy started. US report showed a live intrauterine pregnancy of 37 weeks with anterior placenta reaching os but not covering it with PA/percreta and uteroplacental insufficiency with brain sparing effect. A planned caesarean hysterectomy was done under GA at 36 weeks three days, midline vertical incision given and baby delivered through upper segment transverse incision. The placental tissue was seen perforating serosa at level of lower uterine segment and uterovesical fold during surgery. In collaboration with surgeon, intentional cystotomy (no involvement of bladder was observed) with bladder repair was done. The blood loss was 3 L, 4 units of blood and 4 units of FFP transfused. The foetal Appearance, Pulse, Grimace, Activity and Respiration (APGAR) was 7 and 8 at 1 and 5 minutes respectively, birth weight was 2.7 kg. HPE report gave the diagnosis of placenta increta [Table/Fig-2]. Postoperative period per urethral catheter removed on day seven, patient passed urine normally and discharged on postoperative day seven with postoperative Hb 10.6 gm/dL.



[Table/Fig-2]: Hysterectomy specimen showing placenta increta in lower segment.

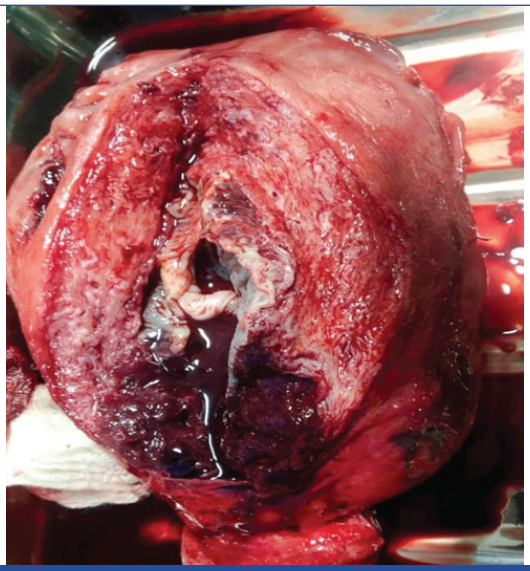
CASE 3

A 27-year-old, G2P1L1 with previous 1 LSCS done at term four years back for severe pre-eclampsia, presented in emergency with amenorrhoea for five months and bleeding per vaginum for three days with Rh negative pregnancy. On admission, patient was conscious, oriented, pulse rate was 110 bpm, BP 120/70 mmHg. On obstetric examination uterus was 24 weeks size, relaxed with no scar tenderness and Foetal Heart Sound (FHS) of 140 bpm. A local examination revealed active bleed and pad was superficially soaked. All baseline investigations including blood typing, complete haemogram, coagulation profile, blood sugar liver and kidney function tests, viral markers, CRP, urine routine and thyroid profile were performed. The patient had Hb of 10 gm/dL, blood group was a negative with Indirect Coombs Test (ICT)-negative and CRP-79.8 mg/L. Ultrasound imaging report revealed a live pregnancy of 20 weeks six days, Amniotic Fluid Index (AFI) of 1-1.5, the placenta was anterior low lying (1.5 cm from cervical os) but not reaching os and had multiple intraplacental lakes. A definitive diagnosis of PA could not be made on US, MRI was planned but due to the patient's worsening condition an emergency hysterotomy was performed under GA via transverse abdominal incision, the foetus was still born. Intraoperative findings revealed a ballooned and thinned out lower uterine segment, with spontaneous partial separation of placenta and rest adherent over lower uterine segment. A massive PPH ensued hence, a total hysterectomy was performed. The blood loss was 2.2 L, 4 unit of PRBC with 4 FFP transfused. Patient needed Intensive Care Unit (ICU) care for one day, the rest of postoperative period was uneventful and patient was discharged on day eight. The histopathology report was a 5.2×3 cm of placental tissue with impression of PA vera.

CASE 4

The patient was 32-year-old with obstetric history: G7P5L4A1, para 1, 2, 3 and 4 were all full-term vaginal deliveries, para 5 was LSCS in view of IUFD with transverse lie and she had one spontaneous abortion followed by D and C one year back. She presented to casualty with 36 weeks gestation by her Last Menstrual Period (LMP) with complaints of pain abdomen and bleeding per vaginum

since one day. Patient was conscious, oriented her pulse was 120/min, BP was 110/70 mmHg. On obstetric examination, uterus size corresponded to 34 weeks, presentation was breech and there was no scar tenderness, FHS heard by doppler. A local examination revealed active bleed. All baseline investigations including blood typing, complete haemogram, coagulation profile, blood sugar, liver and kidney function tests, viral markers, urine routine and thyroid profile were performed. The patient had Hb level of 9.1 gm/dL, ultrasound report revealed a live pregnancy of 34 weeks with oligohydramnios (AFI-2-3), placenta was anterior 0.5 cm away from the os with multiple irregular lacunae of varying sizes seen within the placenta with accrete. The decision of emergency caesarean hysterectomy was taken under GA. A live female baby weighing 2.6 kg, delivered via classical caesarean section and Total abdominal hysterectomy performed with placenta in situ. A total of 4 unit of PRBC with 4 FFP were transfused and blood loss was approximately around two litres. A gross examination of specimen revealed placenta in lower segment, invading myometrium. HPE report demonstrated placenta increta [Table/Fig-3]. On postoperative day seven, patient complained of pain lower abdomen with bleeding PV. An ultrasound was performed, it showed a pelvic haematoma measuring 11.5×9 cm. It was drained transvaginally and the patient discharged under stable condition on day-five of drainage ([Table/Fig-4]; case-4 describing the case in brief).



[Table/Fig-3]: Gross specimen depicting placenta increta.

CASE 5

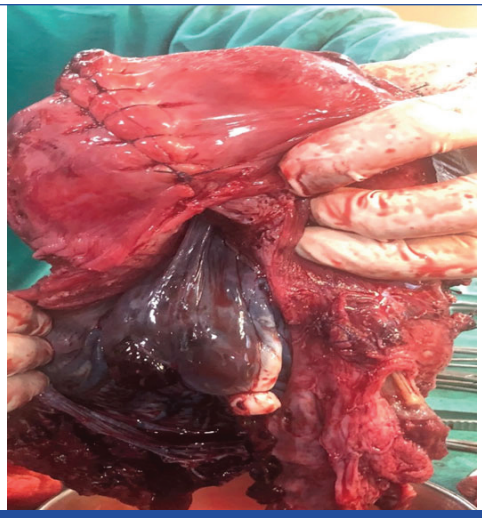
A 36-year-old, G3P2L2, with previous 2 LSCS referred to emergency at 36 weeks 4 days pregnancy with labour pains and clinical suspicion of PA. The ultrasound report with the patient showed anterior complete placenta praevia. The admission vitals were: BP-110/60 mmHg, PR-100 beats/minute. The obstetric examination revealed uterus corresponding to 36 weeks, cephalic presentation with uterine contractions present, FHS was 140 beats per minute and scar tenderness was absent. After getting all relevant investigations (Hb-10.8 gm/dL) and arranging blood, patient was taken up for emergency caesarean section under GA. An upper segment transverse incision was used to take out a live baby the abdominal incision was midline vertical. The placenta did not separate spontaneously, no attempt was made to extract it out and grossly, it was seen to be adherent to myometrium. A total hysterectomy was performed. The blood loss was around 1.5 litres and 3 units of PRBC and 3 FFP were transfused. Histopathological report revealed trophoblastic tissue invading the superficial myometrium in lower segment of uterus without intervening decidua basalis layer with impression of placenta increta [Table/Fig-5,6]. The birth weight of baby was 2.6 kg and APGAR was normal. The postoperative period was satisfactory and patient discharged on day seven. ([Table/Fig-4]; case-5 summarising the case in brief).

CASE 6

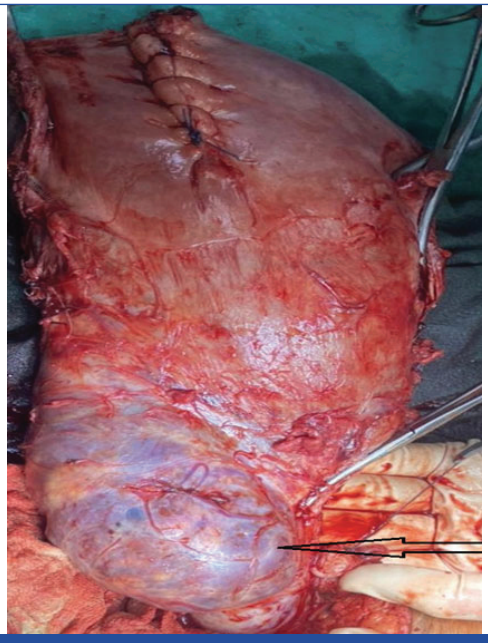
A 34-year-old G4P3L3A0 with previous 3 LSCS reported to the OPD with complaints of bleeding per vaginum at 24 weeks of gestation. The ultrasound was done which showed a live 23 weeks pregnancy with anterior placenta reaching the os (1 cm away from the os) with evidence of PA increta. The MRI findings were suggestive of placenta increta [Table/Fig-7]. The patient was admitted, Hb level was 8 gm/dL, two units of blood transfused and dexamethasone dose was given. The patient was discharged as bleeding stopped and condition was stable. The patient was kept under close follow-up and she reported to the emergency with complaints of bleeding per vaginum and loss of foetal movements at 28 weeks of gestation. The FHS was 140/minute and minimal bleeding was present, patient's vitals were normal and Hb was 9 gm/dL. As bleeding continued and worsened a decision for caesarean hysterectomy was taken and was performed, using midline vertical abdominal incision under GA. The baby delivered via an upper segment transverse incision; lower segment was ballooned out with bladder densely adherent to it. A bladder injury resulted while dissecting bladder from the uterus, but no chorionic tissue seen invading it. The bladder repair was done by urosurgeon and suprapubic catheter

S. No.	Variables	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
1	Age	24-year-old	34-year-old	27-year-old	32-year-old	36-year-old	34-year-old
2	Parity	2	3	1	5	2	3
3	Gestational age	38 weeks	36 weeks 3 days	20 weeks 6 days	36 weeks	36 weeks 4 days	28 weeks
4	Concurrent placenta previa	No	Yes	Yes	Yes	Yes	Yes
5	Previous H/O CD or Uterine surgery	None	2 LSCS and 1 D&C	1 LSCS	1 LSCS and 1 D&C	2 LSCS	3 LSCS
6	Diagnosis timeline	Postnatal	Antenatal	Intraoperative	Antenatal	Intraoperative	Antenatal
7	Diagnostic modality	HPE	US HPE	HPE	US HPE	HPE	US MRI HPE
8	HPE	Placenta accreta vera	Placenta increta	Placenta accrete vera	Placenta increta	Placenta increta	Placenta increta
9	Co-morbidities	Anaemia	GDM	Rh negative anaemia	Anaemia		Anaemia
10	Obstetric outcome	TAH	Planned caesarean with subtotal hysterectomy	Emergency hysterotomy with TAH	Emergency caesarean hysterectomy	Emergency caesarean hysterectomy	Emergency caesarean hysterectomy
11	Complications	Sepsis and secondary PPH	Primary PPH cystotomy and bladder repair	APH and primary PPH	APH, primary PPH and Pelvic haematoma	Primary PPH	APH and bladder injury
13	Blood loss (in litres)	1.4 L	3 L	2.2 L	2 L	1.5 L	1 L

[Table/Fig-4]: Table summarising various features of Placenta Accreta (PA) cases.
HPE: Histopathological examination



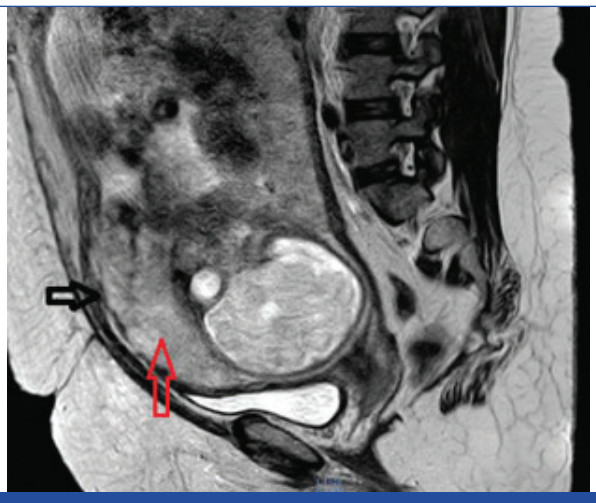
[Table/Fig-5]: Gross specimen showing placenta increta.



[Table/Fig-6]: Image depicting the placenta increta in the lower uterine segment (Black arrow showing the lower uterine bulge, black arrow showing absent myometrial zone).

kept for seven days. A total hysterectomy done, blood loss was approximately 1 litres and patient received 2 units of blood. The baby had delayed respiratory effort, intubation done, but died on day two of respiratory distress. The histopathological report gave diagnosis of PA. The patient was discharged on day seven, per urethral catheter removed on day 14, following which patient had normal voiding.

Summary of all the cases are described in [Table/Fig-4].



[Table/Fig-7]: MRI picture depicting placenta increta (Red arrow showing heterogenous placenta).

DISCUSSION

A total of six women were diagnosed with PAS disorders out of 3012 total deliveries during the study period at the hospital, with a frequency of 1/502 for PA. The rates of PAS disorders is increasing over the years from just over 1 in 2500 in 70's and 80's to as high as 1 in 533 and 3.7 in 1000 in 2005 and 2011, respectively [3,12-15].

History of caesarean delivery was present in 5 (83.33%) of cases, three women underwent ≥2 LSCS and two had prior 1 LSCS. In addition 5 (83.33%) cases had concurrent placenta previa. Previous caesarean delivery and placenta previa are established independent risk factors for PA as evidenced by an exhausting number of studies, along with the fact that increasing number of prior caesarean is associated with increasing risk of PAS disorders [3,14,16-19]. In a large multicentric prospective cohort study of 30132 caesarean deliveries, PA was seen in 0.24% at first caesarean, 0.31% at second, 0.57% at third, 2.13% at fourth, 2.33% at fifth, reaching values of 6.74% in the sixth caesarean section. In cases with placenta previa, the percentage of PA was 3.3%, 11%, 40%, 61%, and 67% for the first, second, third, fourth, and fifth previous caesareans, respectively [19].

The FIGO recommendations for evaluation of epidemiological data for risks in PAS disorders are strong for a caesarean delivery scar, the risk being higher as the number of caesarean delivery increases; and FIGO observes that women with prior CD with coexistent low lying or placenta previa in second trimester are now the major group of women with highest risk of PA. The quality of evidence is low and recommendation weak, for increased risk of PAS with prior myomectomy scar and uterine curettage [20].

Advanced maternal age ≥35 years has been observed to be an independent risk factor for PAS disorders [3,14,17]. In contrast a large multicentre caesarean delivery cohort study, found no association with both age and parity [16]. As far as present series is concerned, a significant number, 4 (66.66%) of women were ≥34 years of age and 5 (83.33%) of the cases were multipara.

Ultrasound imaging is the primary diagnostic modality for PA. A systematic review and meta-analysis of 2017 found positive correlation between the cumulative rates of invasive forms of adherent placenta and diagnostic value of ultrasound imaging [21]. In the present case series, five of the cases underwent US after clinical suspicion, three were confirmed on US, two cases were missed (1 prenatally- case 3 and 1 postdelivery- case 1), and one (case 5) was referred emergency antenatal case with suspicion of adherent placenta diagnosed intraoperatively. All of the cases had histopathological confirmation of diagnosis. A variable diagnostic value of US imaging for PAS has been reported in literature with sensitivity and specificity ranging from 63% and 43% to 100% and 96.8%, respectively [17,22,23]. The addition of colour doppler improves predictive value of ultrasound imaging and it has been suggested to be best single criterion for diagnosing placental adherence [22-24]. American College of Obstetricians and Gynaecologists (ACOG) strongly recommends that even though US evaluation is important, the absence of US findings does not rule out PAS and clinical risk factors remain equally important as predictors of PAS [12].

The MRI has been reported as an accurate marker for diagnosis of PAS disorders and is recommended in equivocal reports of placental invasion on US [25,26]. A recent study has raised concerns about relying on MRI in PAS disorders, as it was observed that MRI changes diagnosis in one third of cases, and once changed the diagnosis was wrong [27]. ACOG gives strong recommendation with moderate quality evidence, that MRI is not the preferred imaging modality for initial evaluation of suspected PAS [12].

All of the cases in present study underwent hysterectomy, five had hysterectomy along with caesarean or hysterotomy, and one had hysterectomy following failed conservative approach (for sepsis with

secondary PPH). A total of three cases (case 3, 4 and 5) underwent emergency surgery, which can be an issue, if patient is not at a level three care centre. If PAS disorder is suspected before giving uterine incision, then mobilisation of multidisciplinary team is to be done, if not possible consider transfer after patient stabilisation [12]. A planned caesarean hysterectomy still remains the preferred approach for PAS disorders. In a meta-analysis, 89.7% of pregnancies with adherent placenta underwent caesarean hysterectomy [21]. In a multicenter study, conservative management was successful for 78.4% of cases with complications being; PPH (primary and secondary), sepsis, ICU admission, Vesicovaginal Fistula (VVF), uterine necrosis and pulmonary embolism [28]. The key FIGO recommendations for surgical management of PA are: 1) delivery to be conducted by a multidisciplinary team in a care of excellence with access to blood products, intensive care facilities, surgical expertise and obstetric anaesthetist; 2) A deliberate cystotomy and excision of involved bladder can be considered in villous tissue involving bladder; 3) Tranexamic acid 1 gm can be administered prior to CD; 4) Leave placenta in situ in absence of spontaneous separation of placenta; 5) Total abdominal hysterectomy is preferred; 6) Role of bilateral Internal Iliac artery ligation at operation is unclear [29].

The approach of caesarean hysterectomy was found to be associated with good outcome in present series. The difficulty encountered during surgery was bladder adhesions as the cases are usually post CD. A diligent sharp dissection of bladder starting from lateral going to middle usually helps getting a safe plane and avoiding injury. The team included two senior obstetricians, a urosurgeon, a senior anaesthetist and neonatologist. The blood products were ensured before hand and a senior surgeon was kept as backup. A prophylactic dose of 1 gm tranexamic acid was given just prior to uterine incision or haemorrhage.

The key FIGO recommendations for conservative approach are strong for; leaving placenta in situ for those who desire fertility with prior establishment of localisation of placental site by ultrasonography, abandoning extirpative approach of forcible manual removal of placenta, and explaining high risk of PAS disorders in future pregnancies to candidates opting for conservative management. FIGO does not recommend routine use of methotrexate, surgical or radiological uterine devascularisation, as well as monitoring with β-hcg and MRI. Antibiotics are to be given postoperatively [30].

The most common complication observed in present series was; PPH in 5 (83.33%) of the cases, others being APH in two, sepsis in one, postoperative pelvic haematoma in one, bladder injury in one case and cystotomy in another case. The average blood loss was 1.85 L and average number of blood transfusions needed ≥3 units. The adverse perinatal outcome was not linked directly to PAS disorders, but premature delivery resulting in poor perinatal outcome was an indirect cause. The complications usually observed in PAS disorders are blood loss (2-3 L), injury to bladder (7-48%), injury to ureter (0-18%), ICU admission (15-66%), surgical site infection (18-32%), thromboembolism (4%) and mortality (1-7%) [29].

The approach of caesarean hysterectomy remains the mainstay of treatment for PAS disorders. A number of conservative or expectant management have been tried lately, but in view of limited data conservative management is considered only for diligently selected cases of PAS after detailed counselling with respect to the associated risks, uncertain benefits and efficacy (ACOG, 2018) [12]. The present case series details experience at present setting regarding risk factors, circumstances of diagnosis, management and outcome in PAS. The study cannot comment on conservative approach for PAS as only one case was kept for conservative management and it failed.

CONCLUSION(S)

The clinical diagnosis of PAS is being encountered more frequently by the obstetricians globally, and it poses a difficult challenge because of its associated maternal morbidity and mortality. Antenatal diagnosis is paramount to planning most appropriate management strategy. US is the primary tool to evaluate PAS in suspected cases, but can miss diagnosis as observed in above series. PAS disorders can be seen in an unscarred uterus, a strong clinical suspicion is to be kept in cases of retained placenta. A history of CD and concomitant placenta previa were the commonest risk factors. Caesarean hysterectomy was preferred approach in our series, and was associated with good maternal outcome.

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