Pro Index | Journal of Science in Medicine and Life
Volume: 3 Issue: 8 Year: 2025
ISSN: 2992-9202 | http://journals.proindex.uz

Some Aspect in Different Modalities of Management of Placenta Accreta Spectrum at Al-Elwiya Maternity Teaching Hospital

Mays Mustafa AbdUlAmeer
Ain Al-Tamr General Hospital

Prof. Dr. Samar Dawood Sarsum
Al-Elwiya Maternity Teaching Hospital

Abstract: **Background:** Placenta accreta spectrum is one of the most dangerous conditions associated with pregnancy, because hemorrhage may result in multisystem organ failure, disseminated intravascular coagulation, need for admission to an intensive care unit, hysterectomy, and even death. The antenatal diagnosis of placenta accreta spectrum is critical because it provides an opportunity to optimize management and outcomes. Cesarean hysterectomy is considered the gold standard treatment for invasive accreta but it remains associated with high rates (40%–50%) of severe maternal morbidity and, in cases of placenta percreta,

Aim of the study: To highlight on the modalities of managing patients with PAS and maternal outcome accordingly at Elwiya hospital.

Patients and methods: This is a prospective cohort study conducted at the Department of Obstetrics and Gynecology Elwiya Maternity Teaching Hospital during a period extended from 1st of January 2022 to 1st of October 2022. The study included all cases of PAS presented to our hospital during this period. Interpretation of indication and outcome of both hysterectomy and uterine conserving surgery were compared.

Results: The study included 30 participants who had preoperative diagnosis of placenta accreta spectrum by ultrasound or intraoperative diagnosis. According to the type of management the studied sample divided into two groups, hysterectomy group included 21 cases and uterine conserving surgery was done in 9 cases. The two groups were not different regarding demographic data, previous medical and surgical histories, and presentation. Regarding the outcome of the surgery, cases of hysterectomy had significantly higher rate of bladder injury and bowel injury, higher amount of blood transfusion, longer duration of the surgery and longer hospital stay than uterine conserving surgery.

Conclusion: Uterine conserving surgery is associated with lower rate of bladder injury, lower requirement of blood transfusion, shorter operative time and hospital stay.

1. Introduction

Placenta accreta spectrum (PAS), first described in 1937, refers to the pathologic invasion of the placental trophoblasts to the myometrium and beyond, which was formerly known as morbidly adherent placenta [(1)].

PAS is one of the most dangerous conditions associated with pregnancy, because hemorrhage may result in multisystem organ failure, disseminated intravascular coagulation, need for admission to an intensive care unit, hysterectomy and even death[(2)].

Outcomes are generally improved with antepartum diagnosis and care by a multidisciplinary team with expertise in the condition. Morbidity is high; more than half of women receive transfusions of blood products, and a third have incidental cystotomy in association with surgical management. Ureteral injury, vesicovaginal fistula and the occurrence of reoperation are less frequent complications[3].

PAS is considered a high-risk condition with serious associated morbidities; therefore, American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal–Fetal Medicine recommend these patients receive level III (subspecialty) or higher care[4].

1.1 Definition:

PAS is the general term applied to abnormal adherence of the placental trophoblast to the uterine myometrium; it is also referred to as morbidly adherent placenta. The spectrum includes placenta accreta (attachment of the placenta to myometrium without intervening decidua), placenta increta (invasion of the trophoblast into the myometrium) and placenta percreta (invasion through the myometrium, serosa, and into surrounding structures) (Figure 1).

The major clinical problem occurs when the placenta does not detach normally from the uterus after delivery of the fetus, leading to bleeding, which is often severe(5).

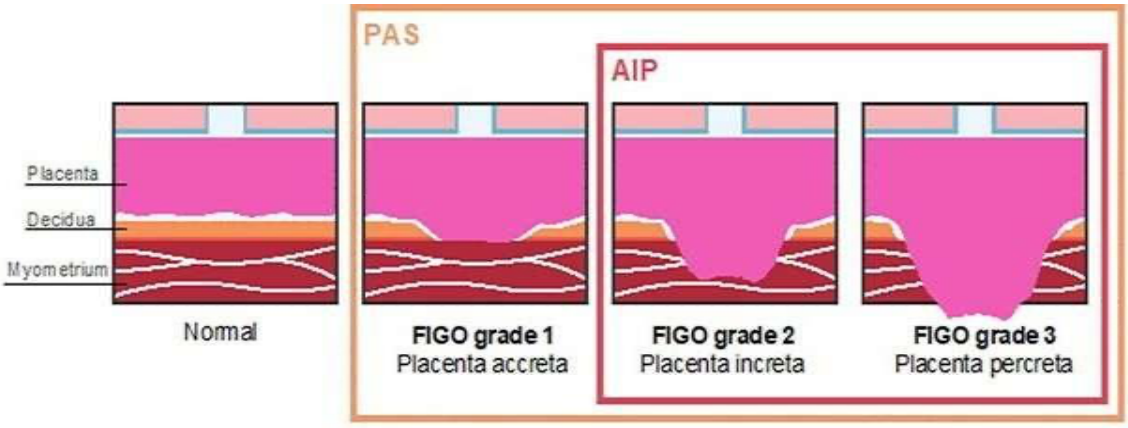

Figure 1: Placenta accreta spectrum[6].

*AIP: abnormally invasive placenta, PAS: Placenta accreta spectrum, FIGO: The International Federation of Gynecology and Obstetrics

1.2 Epidemiology:

As the rate of caesarean delivery is increasing globally, the rates of PAS are increasing. Observational studies from the 1970s and 1980s described the prevalence of placenta accreta as between 1 in 2,510 and 1 in 4,017 compared with a rate of 1 in 533 from 1982 to 2002. A 2016 study conducted using the National Inpatient Sample found that the overall rate of placenta accreta in the United States was 1 in 272 for women who had a birth-related hospital discharge diagnosis, which is higher than any other published study. The increasing rate of placenta accreta over the past four decades is likely due to a change in risk factors, most notably the increased rate of cesarean delivery[7]. In Iraq the rate of CS was nearly half the deliveries (49.5%)[8], this goes with increasing prevalence of PAS disorders in Iraq, as it was 162.4 per 100,000 women in 2014, 266.7 in 2015, 382.3 in 2016, and 191.5 per 100 000 women in 2017[9].

1.3 Risk factors:

PAS has largely been attributed to abnormal or deficient areas of decidua, allowing chorionic villi to adhere to the underlying myometrium. Such damage may result from previous procedures or inflammation. Correspondingly, most of the risk factors studied involve some degree of uterine trauma or scarring. The role of the hormonal environment or the trophoblast itself has been less well addressed but offers ongoing opportunities for discovery.

1.3.1 Placenta previa

Placenta previa is the most important risk factor for PAS, and at one time was considered necessary for the diagnosis. Insufficient decidua in the lower uterine segment and cervix may predispose to placental adherence with low implantations.

1.3.2 Previous cesarean delivery

Given that cesarean deliveries are a common source of scarring in the myometrium and endometrium, this common procedure has been associated with the development of PAS in subsequent pregnancies. This is particularly likely when the patient develops a subsequent previa, with the placenta implanted over the lower segment scar. Multiple studies have shown a linear increase in PAS risk correlating with the number of previous cesareans, both with and without placenta previa[10]

1.3.3 Maternal age

Advanced maternal age, usually defined as 35 years or greater, has been implicated in PAS development. This relationship may be confounded by higher parity and previa risk, as well as a higher probability of previous uterine procedures or fertility treatments, but also may represent an altered hormonal or implantation environment[11].

1.3.4 Previous uterine surgery

Studies have produced inconsistent results regarding PAS development after previous uterine surgery. This may be due to grouping procedures with heterogenous risk profiles, or lack of an appropriate control group with no previous uterine procedures. Uterine curettage is likely the most encountered uterine procedure in a patient's surgical history, but its role as an independent PAS risk factor has been unclear. Some have found the relationship to hold only when evaluating multiple previous procedures, whereas others have found that the relationship is confounded by other patient factors. One study linked accreta development to a history of recurrent miscarriages, but details on surgical treatment were not given. A recent large study used a statewide database to link multiple types of gynecologic procedures with later PAS development. After restricting the analysis to women with no previous delivery and controlling for age and maternal demographics, they found a dose-dependent relationship between the number of previous uterine procedures and development of abnormally invasive placenta. These procedures included laparoscopic uterine procedures, hysteroscopy, and uterine curettage[12].

1.3.5 Previous placenta accreta:

While previous cesarean section is likely the most commonly encountered risk factor from a previous pregnancy, a previous history of accreta or adherent placenta will confer the highest absolute risk. Previous PAS is a novel risk factor, as cases of PAS historically ended in hysterectomy. However, uterine conservation is increasingly described in management of this condition. For patients who have experienced a subsequent pregnancy, PAS rates of 4.7% in the second pregnancy 7.6% in the third pregnancy[13].

1.3.6 Assisted reproductive technology (ART):

Including in vitro fertilization and intracytoplasmic sperm injection, are linked to PAS development. This outcome has been further linked to specific ART practices, including transfer of >1 embryo and use of cryopreserved embryos[14].

Given that known PAS risk factors also overlap with infertility, it is possible that the PAS development with ART results from maternal factors rather than the procedure itself. Such risk factors include advanced maternal age and uterine factor infertility arising from previous procedures or cavity distortion. Placenta previa may be an intermediate step between ART and PAS, as both ART and multiple gestations have been linked to low implantations[15]. However, studies showed an independent relationship between transfer of cryopreserved embryos and PAS even after controlling

for maternal factors and previa[16]. Development of a thin endometrium during uterine preparation has been linked to both previa and PAS development and provides a biologically plausible explanation for this association. Further study of this mechanism may provide an opportunity to reduce PAS risk during the ART process[17].

1.3.7 Other uterine abnormalities

Any condition predisposing to an abnormal decidual-myometrial interface may theoretically contribute to PAS risk. This has been best shown with Asherman syndrome, with which fibrotic scars obliterate the normal endometrium and potentially obstruct the uterine cavity. studies found that 2% rate of accreta and 4% rate of adherent placenta in cases of Asherman syndrome [18]. Pregnancy outcome is likely related to the extent of damage and success of the repair. Adenomyosis and current fibroids may distort the normal endometrium, but have not been well studied with regard to adherent placentation[19].

1.4 Pathophysiology:

Pathophysiology of the PAS Several concepts have been proposed to explain why and how PAS occurs. The oldest concept is based on a theoretical primary defect of trophoblast biology leading to excessive invasion of the myometrium. The current prevailing hypothesis is that a secondary defect of the endometrium-myometrial interface leads to a failure of normal decidualization in the area of a uterine scar, allowing abnormally deep placental anchoring villi and trophoblast infiltration. There is no doubt that the decidua normally regulates trophoblast invasion, as evidenced by the aggressive invasion of the muscular and serosal layers seen at sites of ectopic implantation in the fallopian tube or in the abdomen[19].

1.4.1 Scar implantation

The exact pathogenesis of PAS remains unknown, but the above risk factors give us some clues.. This hypothesis is supported by the finding that the vast majority of PAS patients present a history of disruptions within the uterine cavity such as prior caesarean section, previous operative uterine procedures (myomectomy, operative hysteroscopy, etc.) and/or dilation and curettage of the uterus[20]. Nevertheless, such theory fails to explain the occurrence of PAS in primigravid women without any prior uterine procedure or instrumentation. The potential explanation was reported to be that this rare minority of PAS patients may suffer from one of a series of uterine pathology, such as adenomyosis, submucous fibroids, or bicornuate uterus, which may subsequently result in microscopic endometrial defects that further affect the normal biological functions of the endometrium and thus allow abnormal attachment of the placenta[21]. Other concepts ascribe placenta accreta spectrum to the dysfunction of maternal vascular remodeling in the scarring areas or excessive invasion of the extravillous trophoblast (EVT), which may account for a small part of cases[22].

1.4.2 Scar placentation

Accreta placentation is essentially the consequence of uterine remodeling after surgery, primarily after cesarean delivery. Large cesarean scar defects in the lower uterine segment are associated with failure of normal decidualization and loss of the subdecidual myometrium. These changes allow the placental anchoring villi to implant, and extravillous trophoblast cells to migrate, close to the serosal surface of the uterus. These microscopic features are central to the misconception that the accreta placental villous tissue is excessively invasive and have led to much confusion and heterogeneity in clinical data. Progressive recruitment of large arteries in the uterine wall, that is, helicine, arcuate and/or radial arteries, results in high-velocity maternal blood entering the intervillous space from the first trimester of pregnancy and subsequent formation of placental lacunae. Recently, guided sampling of accreta areas at delivery has enabled accurate correlation of prenatal imaging data with intraoperative features and histopathologic findings. In one study more than 70% of samples, there were thick fibrinoid depositions between the tip of most anchoring villi and the underlying uterine wall and around all deeply implanted villi[23] .

1.4.3 Vascular remodeling

Development of trophoblastic cell lineage on the surface of the embryo is the initial differentiating event in embryonic development. The inner cell mass that goes on to form an embryo and extra embryonic tissues such as the allantois, amnion and yolk sac is surrounded by early trophoblast cells called trophectoderm. Trophoblastic cells are of two types: villous and extravillous trophoblasts (EVT)[24]. Placental villi are covered with cyto and syncytiotrophoblasts, and EVT arise from tips of anchoring villi that make contact with uterine decidua. The EVT are involved in trophoblastic invasion, and they differentiate into interstitial and endovascular subtypes. The interstitial cells invade the decidual stroma as far as the inner third of uterine myometrium called JZ. They are involved in vascular remodeling, while the endovascular subtypes invade uterine spiral arterioles. At the JZ, endovascular trophoblasts fuse to form multinucleated giant cells (MNGs). Migration of EVT is facilitated by their secretion of a variety of matrix metalloproteinases comprising collagenases, gelatinases and stromelysins[25]. In cases of invasive placentation, an unusual uteroplacental vasculature was observed in which physiological changes were present in large arteries deep in the myometrium. Invasion of larger vessels beyond the level of the JZ is probably determined by access rather than a preexisting defect in trophoblastic differentiation that would produce uncontrolled invasion of EVT through the entire depth of the myometrium. Prenatal imaging and macroscopic observation at delivery of the hypervascularity of the placental bed in most cases of invasive placentation suggest a phenomenon of neovascularization around the scar area in addition to the vasodilatation of the radial and/or arcuate uterine vasculature in the accreta area[20].

1.5 Diagnosis of Placenta Accreta Spectrum

Antenatal diagnosis of PAS is highly desirable because outcomes are optimized when delivery occurs at a level III or IV maternal care facility before the onset of labor or bleeding and with avoidance of placental disruption[26] .

1.5.1 Ultrasound:

The primary diagnostic modality for antenatal diagnosis is obstetric ultrasonography. Features of accreta visible by ultrasonography may be present as early as the first trimester; however, most women are diagnosed in the second and third trimesters. Ideally, women with risk factors for PAS , such as placenta previa and previous cesarean delivery, should be evaluated by obstetrician–gynecologists or other health care providers with experience and expertise in the diagnosis of PAS by ultrasonography. Perhaps the most important ultrasonographic association of placenta accreta spectrum in the second and third trimesters is the presence of placenta previa, which is present in more than 80% of accretas in most large series[27].

Other gray-scale abnormalities that are associated with placenta accreta spectrum include multiple vascular lacunae within the placenta, loss of the normal hypoechoic zone between the placenta and myometrium, decreased retroplacental myometrial thickness (less than 1 mm), abnormalities of the uterine serosa–bladder interface and extension of placenta into myometrium, serosa, or bladder[28].

Early ultrasound examination for at-risk patients is important to consider ensuring accurate dating and enable early diagnosis. A reasonable approach is to perform ultrasound examinations at approximately 18–20, 28–30, and 32–34 weeks of gestation in asymptomatic patients. This allows for the assessment of previa resolution, placental location to optimize timing of delivery, and possible bladder invasion[29].

1.5.2 Doppler imaging

The use of color flow Doppler imaging may facilitate the diagnosis. Turbulent lacunar blood flow is the most common finding of placenta accreta spectrum on color flow Doppler imaging. Other Doppler findings of PAS include increased subplacental vascularity, gaps in myometrial blood flow, and vessels bridging the placenta to the uterine margin. Although clinical risk assessment may be

the most important tool to assess for PAS , many studies report very high sensitivity and specificity for obstetric ultrasonography in the diagnosis of PAS [30].

1.5.3 Magnetic resonance imaging

Magnetic resonance imaging (MRI) is the other major tool used for the antenatal diagnosis ofPAS . MRI features associated with PAS include dark intraplacental bands on T2-weighted imaging, abnormal bulging of the placenta or uterus, disruption of the zone between the uterus and the placenta, and abnormal or disorganized placental blood vessels. The accuracy of MRI for the prediction of placenta accreta spectrum is reasonably good, with a systematic review reporting sensitivities of 75–100% and specificities of 65–100%. Taken in total, the overall sensitivity of MRI was 94.4% (95% CI, 86.0–97.9) and the specificity was 84.0% (95% CI, 76.0–89.8), which is comparable to ultrasonography[31].

Magnetic resonance imaging may be useful for diagnosis of difficult cases, such as posterior placenta previa, and to assess depth of invasion in suspected percreta. However, proof of clear value is lacking and there are downsides to MRI worthy of consideration[32].

Most cases of placenta accreta spectrum can be co-managed by local physicians in consultation with a level III or IV care facility, so that travel and time away from family can be minimized[33].

1.6 General classification of placenta accreta spectrum [34]

According to FIGO classification (2018) for the clinical diagnosis of PAS disorders three grades of PAS were identified, each grade diagnosed by either clinical, or histological criteria.

Grade 1: Abnormally adherent placenta (placenta adherenta or creta) **Clinical criteria**

- At vaginal delivery o No separation with synthetic oxytocin and gentle controlled cord traction.
- Attempts at manual removal of the placenta results in heavy bleeding from the placenta implantation site requiring mechanical or surgical procedures.
- If laparotomy is required (including for cesarean delivery) o Same as above

Macroscopically, the uterus shows no obvious distension over the placental bed (placental ―bulge‖), no placental tissue is seen invading through the surface of the uterus, and there is no or minimal neovascularity **Histologic criteria**

- Microscopic examination of the placental bed samples from hysterectomy specimen shows extended areas of absent decidua between villous tissue and myometrium with placental villi attached directly to the superficial myometrium.
- The diagnosis cannot be made on just delivered placental tissue nor on random biopsies of the placental bed.

Grade 2: Abnormally invasive placenta (Increta) **Clinical criteria**

- At laparotomy o Abnormal macroscopic findings over the placental bed: bluish/purple colouring, distension (placental ―bulge‖)
- Significant amounts of hypervascularity (dense tangled bed of vessels or multiple vessels running parallel craniocaudially in the uterine serosa)
- No placental tissue seen to be invading through the uterine serosa.
- Gentle cord traction results in the uterus being pulled inwards without separation of the placenta (so-called the dimple sign) **Histologic criteria**
- Hysterectomy specimen or partial myometrial resection of the increta area shows placental villi within the muscular fibers and sometimes in the lumen of the deep uterine vasculature (radial or arcuate arteries)

Grade 3: Abnormally invasive placenta (Percreta)

Grade 3a: Limited to the uterine serosa **Clinical criteria**

- At laparotomy o Abnormal macroscopic findings on uterine serosal surface (as above) and placental tissue seen to be invading through the surfaceof the uterus.
- No invasion into any other organ, including the posterior wall of the bladder (a clear surgical plane can be identified between the bladder and uterus). **Histologic criteria**
- Hysterectomy specimen showing villous tissue within or breaching the uterine serosa.

Grade 3b: With urinary bladder invasion. **Clinical criteria**

- At laparotomy o Placental villi are seen to be invading into the bladder but no other organs.
- Clear surgical plane cannot be identified between the bladder and uterus. **Histologic criteria**
- Hysterectomy specimen showing villous tissue breaching the uterine serosa and invading the bladder wall tissue or urothelium

Grade 3c: With invasion of other pelvic tissue/organs **Clinical criteria**

- At laparotomy o Placental villi are seen to be invading into the broad ligament, vaginal wall, pelvic sidewall or any other pelvic organ (with or without invasion of the bladder) **Histologic criteria**
- Hysterectomy specimen showing villous tissue breaching the uterine serosa and invading pelvic tissues/organs (with or without invasion of the bladder) [34].

1.7 Management

1.7.1 "Expected" or antenatally diagnosed placenta accreta spectrum

The antenatal diagnosis of placenta accreta spectrum is critical because it provides an opportunity to optimize management and outcomes. Optimal management involves a standardized approach with a comprehensive multidisciplinary care team. This team will likely include, but is not limited to, experienced obstetricians and maternal–fetal medicine subspecialists, pelvic surgeons with advanced expertise (often, but not exclusively, gynecologic oncologists or female pelvic medicine and reconstructive surgeons), urologists, interventional radiologists, obstetric anesthesiologists, critical care experts, general surgeons, trauma surgeons and neonatologists[33].

1.7.1.1 Preoperative Considerations and Management

1.7.1.1.1 Timing of delivery

Timing of delivery decisions need to balance maternal risks and benefits with those of the fetus or neonate. It appears that performing a cesarean delivery followed immediately by cesarean hysterectomy before the onset of labor improves maternal outcomes, yet the optimal timing remains unclear[35]. A decision analysis suggests that 34 weeks of gestation is optimal given the ability of most large centers to handle neonatal complications at that gestational age and the increased risk of bleeding after 36 weeks. Although individual factors are relevant, a window of 34 0/7–35 6/7 weeks of gestation is suggested as the preferred gestational age for scheduled cesarean delivery or hysterectomy absent extenuating circumstances in a stable patient[36].

Earlier delivery may be required in cases of persistent bleeding, preeclampsia, labor, rupture of membranes, or fetal compromise, or developing maternal comorbidities. Waiting beyond 36 0/7 weeks of gestation is not advised because approximately one half of women with placenta accreta spectrum beyond 36 weeks require emergent delivery for hemorrhage[36].

1.7.1.1.2 Corticosteroids use

The use of corticosteroids, for the enhancement of lung maturity, is recommended for patient who is going to be delivered by elective C/S prior to 37 weeks of gestation[37].

1.7.1.1.3 Management of anemia

Anemia during pregnancy should be evaluated and managed accordingly based on specific diagnosis. Optimizing hemoglobin values during pregnancy makes implicit sense.. [30].

1.7.1.1.4 Bedrest

Bedrest (or decreased activity) or pelvic rest or both, is of unproven benefit in all settings, including placenta accreta spectrum, although in the past it was often advised, especially in the setting of bleeding. Without existing evidence to guide practice, clinicians should individualize the decision to modify activity or recommend pelvic rest for women with placenta accreta spectrum[30].

1.7.1.1.5 Hospital admission

Antenatal bleeding, preterm labor and preterm prelabor rupture of membranes are associated with unscheduled delivery as well as maternal and neonatal morbidity. Women with these complications are most likely to benefit from hospitalization. In addition, women with previa and one episode of bleeding may be at increased risk of subsequent bleeding. Issues such as distance from a hospital or referral center and other logistic considerations also may influence the decision to hospitalize. Decisions about hospitalization and activity should be based on each patient's individual preference[38].

1.7.1.1.6 Preoperative ureteric stenting

The value of preoperative ureteric stent placement in cases with noted bladder involvement is unclear and is left to a case-by-case evaluation. Collaboration with a urologic surgeon or a gynecologic oncologist is advisable in cases with suspected urologic involvement[39].

1.7.1.1.7 Preoperative interventional radiology

The role of preoperative placement of catheters or balloons into pelvic arteries for potential interventional radiologic occlusion also is controversial[40]. Internal Iliac artery occlusion (Figure 2) has been reported to decrease blood loss in some but not all case series. A small randomized controlled trial also showed no benefit. Because serious complications such as arterial damage, occlusion and infection may occur, routine use is not recommended[41].

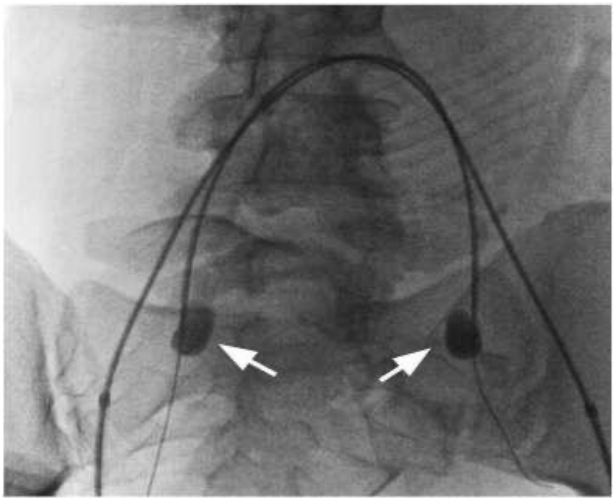

Figure 2: Angiographic image shows occlusion balloons in internal iliac vessels.

1.7.1.2 Intraoperative considerations and management

Preoperative counseling should include review of planned and possible alternate surgical strategies and complications. The most generally accepted approach to PAS is cesarean hysterectomy with the placenta left in situ after delivery of the fetus (attempts at placental removal are associated with significant risk of hemorrhage). Many standard routine operative procedures, including use of standard perioperative antibiotic prophylaxis, remain applicable. Many clinicians will rapidly close the uterine incision and then proceed with hysterectomy after verification that the placenta will not spontaneously deliver. Attempts at forced placental removal often result in profuse hemorrhage and are strongly discouraged. If an antenatal diagnosis of placenta accreta spectrum is uncertain or the

preoperative diagnosis is unclear, a period of intraoperative observation for spontaneous uterine placental separation is appropriate as long as preparations for uterine removal are in place[42].

1.7.1.2.1 Access

Because of a lack of comparative data, choice of skin incision is left to operator judgment, although many employs vertical incisions for better access and visualization. Reasonable alternatives are wide transverse incisions such as a Maylard or Cherney incision[43].

1.7.1.2.2 Operation

Pelvic vessel interventional radiologic strategies may be useful, but not all cases are amenable to these less invasive approaches and their use should be considered on a case-by-case basis. Inspection of the uterus after peritoneal entry is obtained is highly recommended to discern the level of placental invasion and specific placental location, which allows for optimizing the approach to the uterine incision for delivery and likely hysterectomy. Whenever possible, the incision in the uterus should avoid the placenta, which sometimes makes a nontraditional incision necessary. Likewise, cystoscopy is sometimes necessary to discern anatomy if bladder involvement is suspected on direct visualization. In most cases when hysterectomy is necessary, a total hysterectomy is required because lower uterine segment or cervical bleeding frequently precludes a supracervical hysterectomy. Regardless, extensive vascular engorgement with challenging anatomy is the rule, and having the most experienced pelvic surgeons involved from the outset is recommended. Careful dissection in the retroperitoneal space with attention to devascularization of the uterine corpus in proximity to the placenta often is required given the overwhelming vascularity and friability of involved tissues[43].

Types of surgery are:

1. Cesarean hysterectomy is considered the gold standard treatment for invasive accreta but it remains associated with high rates (40%–50%) of severe maternal morbidity and, in cases of placenta percreta, the mortality rates can be as high as 7% owing to damage to pelvic organs and vasculature[44].

2. Alternative conservative surgical procedures: which includes:

A-One-step conservative surgery approach: It consists of resecting the invasive accreta area (partial myometrial resection) followed by immediate uterine reconstruction and bladder reinforcement. This strategy aims to combine the advantages of both the ―leaving in situ approach‖ of preserving the uterus and cesarean hysterectomy with minimal risk of secondary bleeding or infection[45]. The main steps in this uterine-sparing technique can be performed via a modified Pfannenstiel or midline incision. It is advantageous for low- and middle-income countries where expensive additional treatments such as interventional radiology may not be available. It consist of:

- Vascular disconnection of newly formed (feeder) vessels and the separation of invaded uterine tissues from invaded vesical tissues.
- Upper-segmental hysterotomy and delivery of the fetus.
- Resection of all invaded myometrial tissue and the entire placenta in one piece with previous local vascular control.
- Surgical procedures for hemostasis.
- Myometrial reconstruction in two planes.
- Bladder repair if necessary[45].

B-The Triple-P procedure. A novel uterine-sparing procedure for PAS disorders called the ―Triple-P procedure‖ was recently proposed[46]. The aim of this procedure is to avoid incising through the vascular placental venous sinuses, and to excise the myometrium with PAS disorder tissue and to reconstitute the uterine defect. [44]

C-Tamponade techniques: Small case series have also reported the successful use of compression sutures, using the cervix as a natural tamponade by inverting it into the uterine cavity and suturing the anterior and/or the posterior cervical lips into the anterior and/or posterior walls of the lower uterine segment[47].

1.7.1.2.3 Monitoring

Close monitoring of volume status, urine output, ongoing blood loss, and overall hemodynamics is critically important during these cases. Frequent and ongoing dialogue between surgical, anesthesia, and intraoperative nursing staff are recommended to ensure all are continuously apprised of current status, ongoing blood loss, and expectations about future blood loss. Use of hemorrhage checklists also are strongly encouraged given their ability to ensure all options are considered and no details are neglected because of the focus on surgical activities. Ongoing attention to blood loss, hemoglobin, electrolytes, blood gas, and coagulation parameters is key and can inform, in near real time, objective needs for replacement[48].

1.7.1.2.4 Transfusion

There have been no controlled studies of the best ratios for blood product replacement in obstetrics. However, data from other surgical disciplines support the use of a 1:1:1 to 1:2:4 strategy of packed red blood cells: fresh frozen plasma: platelets[49].

1.7.1.2.5 Antifibrinolytic therapy

Antifibrinolytic therapy is another adjunctive therapy that may be useful in placenta accreta spectrum, especially in the setting of hemorrhage. Tranexamic acid inhibits fibrin degradation and decreases bleeding complications and mortality in nonobstetric patients. A large, recent, multicenter, international randomized clinical trial showed a reduction in maternal death due to hemorrhage in cases of postpartum hemorrhage treated with tranexamic acid[50].

1.7.1.2.6 Clotting factors

Several other clotting factors may help in cases of refractory bleeding. In the past, the goal of fibrinogen therapy was to achieve levels of 100 mg/dL or greater, but this may be too low in pregnancy. Levels less than 200 mg/dL are associated with severe postpartum hemorrhage. Although cryoprecipitate can be used to increase fibrinogen, fibrinogen concentrates may be preferred to reduce the risk of transmitting viral pathogens. Efficacy of fibrinogen transfusion in the setting of obstetric hemorrhage or placenta accreta spectrum is unknown. Recombinant activated factor VIIa has been used in the management of severe and refractory postpartum hemorrhage. Downsides are a risk of thrombosis and considerable cost[51].

1.7.1.2.7 Control pelvic hemorrhage

Hypogastric artery ligation may decrease blood loss, but its efficacy has not been proved and it may be ineffective because of collateral circulation. In addition, hypogastric artery ligation can be difficult and time consuming, although it can be easily performed by experienced surgeons. The use of interventional radiology to embolize the hypogastric arteries in cases of persistent or uncontrolled hemorrhage may be useful. Interventional radiology is especially helpful when there is no single source of bleeding that can be identified at surgery. However, it can be difficult to safely perform in unstable patients and the equipment and expertise are not available in all centers[52].

Other methods to address severe and intractable pelvic hemorrhage include pelvic pressure packing and aortic compression or clamping. Pelvic packing, although not standard management, can be highly effective for patient stabilization and product replacement when experiencing acute uncontrolled hemorrhage [53].

Several other factors should be considered in the setting of hemorrhage and PAS. Patients should be kept warm because many clotting factors function poorly if the body temperature is less than 36°C. Acidosis also should be avoided. If blood loss is excessive, often defined as estimated blood loss of 1,500 mL or greater, prophylactic antibiotics should be re-dosed[49].

1.7.1.2.8 Laboratory testing

Laboratory testing is critical to the management of obstetric hemorrhage. Baseline assessment at the initiation of bleeding should include platelet count, prothrombin time, partial thromboplastin time, and fibrinogen levels, which are normally elevated in pregnant women. Rapid and accurate results can facilitate transfusion management, although the massive transfusion protocol is not based on laboratory studies. Thus, developing a protocol that allows for rapid results from a centralized laboratory or having point of care testing on the labor and delivery unit or in the general operating room is desired[54].

1.7.1.2.9 General consideration

As with any case of uncontrolled hemorrhage, the following are key concepts to remember treat the patient based on clinical presentation initially and do not wait for laboratory results, keep the patient warm, rapidly transfuse, and when transfusing in the setting of acute hemorrhage, be sure to transfuse packed red blood cells, fresh frozen plasma, and platelets in a fixed ratio[52].

1.7.1.3 Postoperative Considerations and Management

Given the extensive surgery, placenta accreta spectrum patients require intensive hemodynamic monitoring in the early postoperative period. This often is best provided in an intensive care unit setting to ensure hemodynamic and hemorrhagic stabilization. Close and frequent communication between the operative team and the immediate postoperative team is strongly encouraged[30].

Clinical vigilance for complications such as renal failure; liver failure; infection; unrecognized ureteral, bladder, or bowel injury; pulmonary edema; and diverse intravascular coagulation is warranted. Lastly, attention to the small but real possibility of Sheehan syndrome (also known as postpartum pituitary necrosis) is warranted given the clinical scenario and the potential for hypoperfusion[55].

Despite antenatal diagnosis of placenta accreta spectrum and extensive delivery planning, it is possible that a patient may develop unexpected complications that may or may not be related to placenta accreta spectrum and that require an unscheduled delivery.

1.7.2 “Unexpected” and Unplanned Intraoperative Recognition of Placenta Accreta Spectrum

Sometimes PAS is unexpectedly recognized at the time of cesarean delivery, either before the uterine incision (optimal) or after the uterus is opened, the fetus is delivered, and attempts to remove the placenta have failed. It is also possible to make the diagnosis of PAS after vaginal delivery. The level and capabilities of the response will vary depending on local resources, timing, and other factors[56].

1.7.2.1 Uterine Preservation and Expectant Management

Uterine preservation, referred to here as conservative management, is usually defined as removal of placenta or uteroplacental tissue without removal of the uterus[57].

Expectant management is defined as leaving the placenta either partially or totally in situ[58].

PAS spectrum is potentially life threatening, hysterectomy is the typical treatment. Consideration of conservative or expectant approaches should be rare and considered individually. Major complications of treatment of PAS are loss of future fertility, hemorrhage, and injury to other pelvic organs. To reduce these complications, some have advocated conservative or expectant management in patients with PAS . As defined previously, conservative management is removal of the placenta or uteroplacental tissue without removing the uterus. For patients with focal placental adherence, removal of the placenta by either manual extraction or surgical excision followed by repair of the resulting defect has been associated with uterine preservation in some cases.

Although randomized trials that compared hysterectomy to this approach are not available, it is apparent that blood loss is significantly less in a patient with a small defect using this approach. In

patients with too large a defect to subsequently repair, there are data that suggest that en bloc removal of the entire uteroplacental defect followed by uterine closure results in reduced blood loss and maintains potential fertility[59].

Alternatively, in a recent report, placental removal alone followed by insertion of a Bakri balloon was successful in preventing hysterectomy in 84% of patients with PAS[60]. It is noteworthy that these conservative approaches have been reported only in small numbers of cases and it is unclear that all the patients included actually had PAS . Accordingly, efficacy remains uncertain. In patients with more extensive PAS , expectant management is considered an investigational approach. With expectant management, the cord is ligated near the placenta and the entire placenta is left in situ or only the placenta that spontaneously separates is removed before uterine closure[61].

1.7.3 Adjuncts to Conservative and Expectant Management

In addition to leaving the placenta in situ, investigators have used adjunctive measures to diminish blood loss, hasten placental reabsorption, or both. Techniques have included uterine devascularization with uterine artery balloon placement, embolization or ligation, and postdelivery methotrexate administration. Methotrexate use in expectant management of placenta accreta spectrum is advocated by some authors who contend that it will hasten placental involution and resorption[62]. The biologic plausibility of this premise may be questioned because methotrexate targets rapidly dividing cells and division of third trimester placental cells is limited. Further, methotrexate has the potential for maternal hematologic and nephrologic toxicities and is contraindicated in breastfeeding because of neonatal morbidity. Given the unproven benefit and possible harm, methotrexate to hasten placental resorption is not recommended[59]. For expectantly managed patients with persistent placental tissue with or without substantial bleeding [63].

1.7.4 Delayed Interval Hysterectomy

Delayed interval hysterectomy is a derivative of an expectant approach to placenta accreta spectrum, except that future fertility is not a consideration, and minimizing blood loss and tissue damage are the primary goals. Patients with placenta percreta are optimal candidates for this procedure because they have an increased risk of blood loss and tissue damage if hysterectomy is performed at the time of cesarean delivery[64]. A visualized workflow for the management of PAS from three steps (predelivery, during delivery and postdelivery) is summarized in Figure 3.

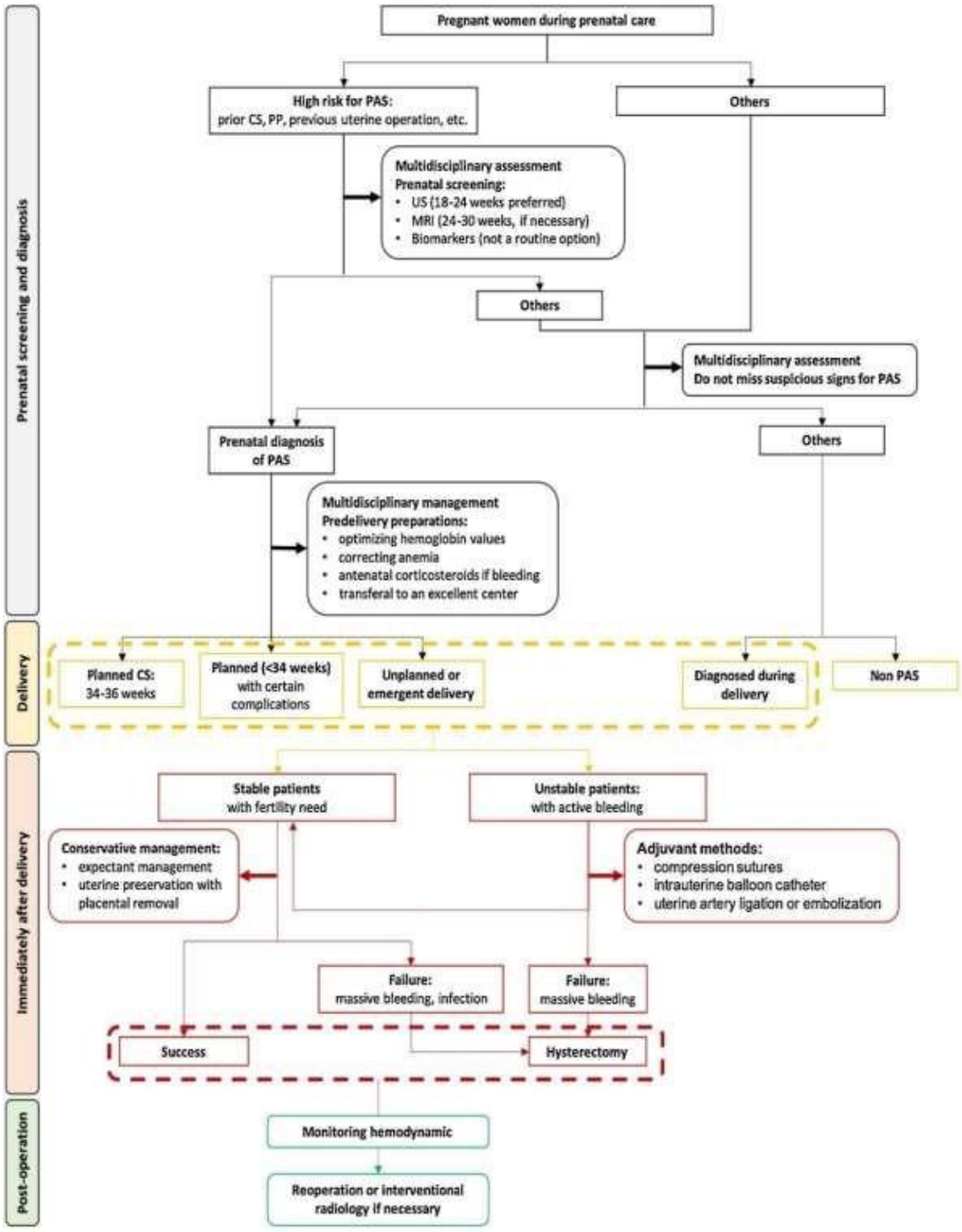

Figure 3: Management flowchart[21].

1.8 Aim of Study

To highlight on the modalities of managing patients with PAS and maternal outcome accordingly at Al-Elwiya hospital.

2. Patients And Methods

2.1 Study Design, Setting and Data Collection Time

This was a prospective cohort study conducted at the Department of Obstetrics and Gynecology Elwiya Maternity Teaching Hospital during a period extended from 1st of January 2022 to 1st of October 2022.

2.2 Study patients and sample size

The study included all cases of placenta accreta spectrum presented to our hospital during this period.

2.3 Inclusion criteria

✓ Pregnant women with clinical diagnosis of PAS (preoperative or intraoperative) .

2.4 Data collection:

All cases were fully assessed regarding history ,examination ,ultrasound and investigation .After stabilization of the condition and application of ABC protocol, and preparation of blood, cases were interviewed with full history and pre-designed questionnaire that informed about the demographical data patient age, weight and height, gravidity, parity and miscarriage, educational level, occupation, and residency.

Information on the current pregnancy obtained that include antenatal care visit (ANC) regularity and frequency, last menstrual period, expected date of delivery, and estimation of the gestational age (GA). The presenting complaints (abnormal vaginal discharge, vaginal bleeding, and fetal movements).

History of previous medical conditions, smoking or chronic drug use.

Previous surgical history, number of CS, previous uterine surgery, and any congenital uterine malformations.

Full examination including general, physical, vital signs, abdominal and obstetrical examination .

All cases undergo trans-abdominal ultrasound, with assessment of the diagnostic criteria which include:

- Disappearance uteroplacental clear zone
- Thinning of myometrium
- Vascular changes within the placenta
- Placental bed hypervascularity

Cases undergo surgery, the surgery done by senior on call and consultant on call who were in charge to give the decision about the best modality to use.

Intervention applied such as the need for blood products, ICU admission were recorded.

Intraoperative findings of distension over the placental bed or bluish/purple coloring or neovascularity, Invasion of placenta through uterine surface or other structures were noted.

Patients were subjected to either hysterectomy or uterine preservation surgery. According to the patient's condition they were divided into two groups, A: patients with hysterectomy and B: patients with uterine preservation surgery.

At Al-Elwiya hospital ,we have special team on call in contact with urologist , general surgeon, vascular surgeon.

All patients were followed during the intra & post operative period.

2.5 Ethical considerations and official approvals

Formal permission was obtained from each patient prior to collecting data, and information were anonymous. Names were removed and replaced by identification codes. All information kept confidential in a password secured laptop and data used exclusively for the research purposes.

Administrative approvals were granted from the following

1. The Council of Iraqi Board of Medical Specialization.
2. Approval and agreement of the Department of Obstetrics and Gynecology at Al- Elwiya Maternity Teaching Hospital.

2.6 Statistical analysis

The modality of treatment of PAS were compared according to patient characteristics, and outcome using Statistical Package for Social Sciences (SPSS) version 26. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Normality of the distribution of the continuous variables tested by Shapiro–Wilk test. The independent t-test (two tailed) was used to compare the parametrical continuous variables while, Mann-Whitney U test for non-parametrical continuous variables. The Chi square test and Fisher-Freeman-Halton exact test were used for estimation of the significance of categorical data. A level of P – value less than 0.05 was considered significant.

3. Results

Total number of deliveries during the period from 1st of January 2022 to 1st of October 2022 at Al-Elwiya hospital were 10377 deliveries, number of caesarean section scars were 4118, placenta accrete were 30 cases.

The study included 30 participants who had preoperative diagnosis of PAS by U/S, according to the type of management the studied sample divided into two groups, hysterectomy group (which included 21 cases) and uterine conserving surgery was done in 9 cases, as shown in Figure 4. To note that the mode of surgical management was dependent solely on senior decision and consultant.

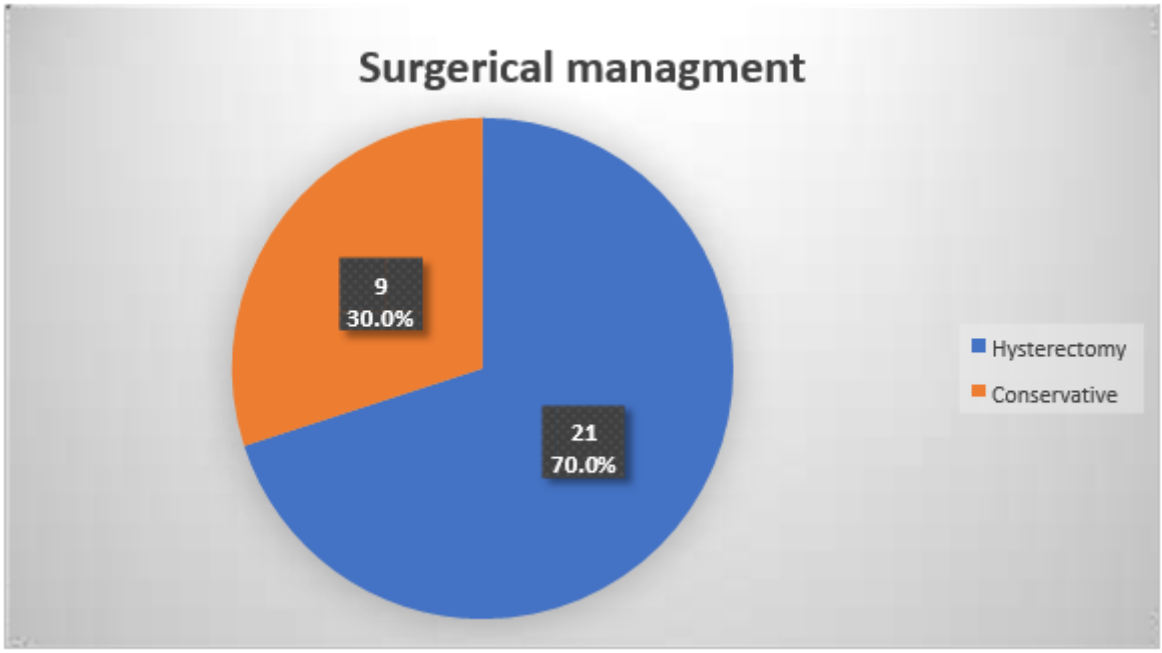

Figure 4: Study groups

Table 1: Distribution of demographical data.

Variables	Hysterectomy		Conservative		P Value
	Mean	SD	Mean	SD	
Age	32.81	4.7	31.22	6.36	0.513
GA	34.91	1.05	34.76	1.11	0.734
Gravidity	7.1	1.64	6.22	1.99	0.267
Parity	5.48	1.66	4.78	2.39	0.441
Miscarriage	0.62	0.5	0.44	0.53	0.412

Regarding the gestational age, 15 cases presented at 34-35 week of gestation, 3cases presented before 34 week, 7cases presented at 36 week, 5 cases presented at 37-38 week.

The two groups were not different in regards to demographical data, as shown in table 1.

The previous medical and surgical histories were not different between the two groups, as shown in Table 2.

Table 2: Distribution of data according to previous history

Variables		Hysterectomy		Conservative		P Value
		No.	%	No.	%	
No. of CS	1-3	8	38.1	1	11.1	0.107
	3-5	4	19	5	55.6	
	>5	9	42.9	3	33.3	
Uterine surgery	Yes	1	4.8	2	22.2	0.144
	No	20	95.2	7	77.8	
Previous accrete	Yes	6	28.6	1	11.1	0.300
	No	15	71.4	8	88.9	
Diabetes	Yes	4	19	2	22.2	0.842
	No	17	81	7	77.8	
Hypertension	Yes	5	23.8	3	33.3	0.589
	No	16	76.2	6	66.7	

Regarding the presentation, there was no difference between the two groups. The site of placenta was mainly low lying anteriorly, the ultrasound showed normally situated placenta in 5 cases, intraoperatively 90% of the cases (27 case) were diagnosed to be accreta, while increta diagnosed in two cases, and percreta diagnosed in one case, as shown in table 3.

Table 3: Distribution of data according to presentation and ultrasonic features.

Variables		Hysterectomy		Conservative		P Value
		No.	%	No.	%	
Presentation	Emergency	19	90.5	6	66.7	0.109
	Elective	2	9.5	3	33.3	
Bleeding	Yes	16	76.2	5	55.6	0.258
	No	5	23.8	4	44.4	
Contractions	Yes	13	61.9	3	33.3	0.151
	No	8	38.1	6	66.7	
	Ultrasonic findings					
Site of placenta by us	Anterior normally situated	3	14.3	2	22.2	0.168
	Posterior normally situated	2	9.5	3	33.3	
	Anterior low lying	7	33.3	4	44.4	
	posterior low lying	6	28.6	0	0	
	Central	3	14.3	0	0	
Ultrasound	Accreta	13	61.9	8	88.9	0.271
	Not accrete	4	19	1	11.1	
	No US available	4	19	0	0	

Table 4: Intraoperative findings.

Variables		Hysterectomy		Conservative		P Value
		No.	%	No.	%	
Adhesions	Yes	11	52.4	5	55.6	0.873
	No	10	47.6	4	44.4	
Varicosity	Yes	4	19	1	11.1	0.593
	No	17	81	8	88.9	

Dehiscent scar	**Yes**	3	14.3	4	44.4	0.073
	No	18	85.7	5	55.6	
Intra operative diagnosis	**Accreta**	19	90.5	8	88.9	0.667
	Increta	1	4.8	1	11.1	
	Percreta	1	4.8	0	0	
Neovascularity	**Yes**	19	90.5	2	22.2	**<0.0001**
	No	3	14.3	7	77.8	
Heavy bleeding after Manual removal of the placenta	**Yes**	21	100.0	9	100.0	N/A
	No	0	0.0	0	0.0	
Distension over the placental bed or bluish/purple coloring	**Yes**	17	81.0	4	44.4	**0.045**
	No	4	19.0	5	55.6	
Cord traction results in uterine dimple sign	**Yes**	18	85.7	5	55.6	0.073
	No	3	14.3	4	44.4	
Placental tissue invades through uterine surface	**Yes**	5	23.8	0	0.0	N/A
	No	16	76.2	9	100.0	
Invasion of other structures	**Yes**	1	4.8	0	0.0	N/A
	No	20	95.2	9	100.0	

Adhesions were found in 16 cases, severe varicosity diagnosed in five cases, and dehiscent scar diagnosed in seven cases. There was no statistical difference between the two groups in regard to presentation, ultrasound findings, and intraoperative findings. Intraoperative findings of distension over the placental bed or bluish/purple coloring or neovascularity were higher in cases of hysterectomy group than conservative management. Invasion of placenta through uterine surface or other structure were managed solely by hysterectomy, as explained in Table 4.

Table 5: Characteristic of the surgical outcome.

Variables		**Hysterectomy**		**Conservative**		**P Value**
		No.	**%**	**No.**	**%**	
Injury to Bladder	**Yes**	11	52.4	1	11.1	**0.034**
	No	10	47.6	8	88.9	
Injury to Ureter	**Yes**	3	14.3	1	11.1	0.815
	No	18	85.7	8	88.9	
Bowel Injury	**Yes**	3	14.3	1	11.1	0.815
	No	18	85.7	8	88.9	
Use of blood Products	**Yes**	18	85.7	6	66.7	0.232
	No	3	14.3	3	33.3	
amount of blood transfused	**no transfusion**	3	14.3	3	33.3	**0.005**
	1-4 pints	1	4.8	4	44.4	
	> 4 pints	17	81	2	22.2	
Second intervention	**Yes**	2	9.5	1	11.1	0.894
	No	19	90.5	8	88.9	
ICU	**Yes**	19	90.5	7	77.8	0.348
	No	2	9.5	2	22.2	
PPH	**Yes**	7	33.3	2	22.2	0.543
	No	14	66.7	7	77.8	
Death	**Yes**	1	4.8	0	0	N/A
	No	20	95.2	9	100	

Regarding the outcome of the surgery, cases of hysterectomy had significantly higher rate of bladder injury than uterine conserving surgery. The amount of blood had been transfused was

significantly higher (massive blood transfusion required in 81% of the cases of hysterectomy, and only 22.2% of uterine conserving surgery).

On the other hand, bowel injury, ureteric injury, second intervention, ICU admission rate and PPH rate were not different between the two groups, as shown in Table 5.1cases were required 2nd intervention, 2 cases after doing subtotal hysterectomy, 1 case after uterine conserving surgery.

Regarding the type of surgery used the most common type of hysterectomy was total hysterectomy, and most common type of conservative surgery was oversewing with uterine artery ligation, as shown in Figure 5

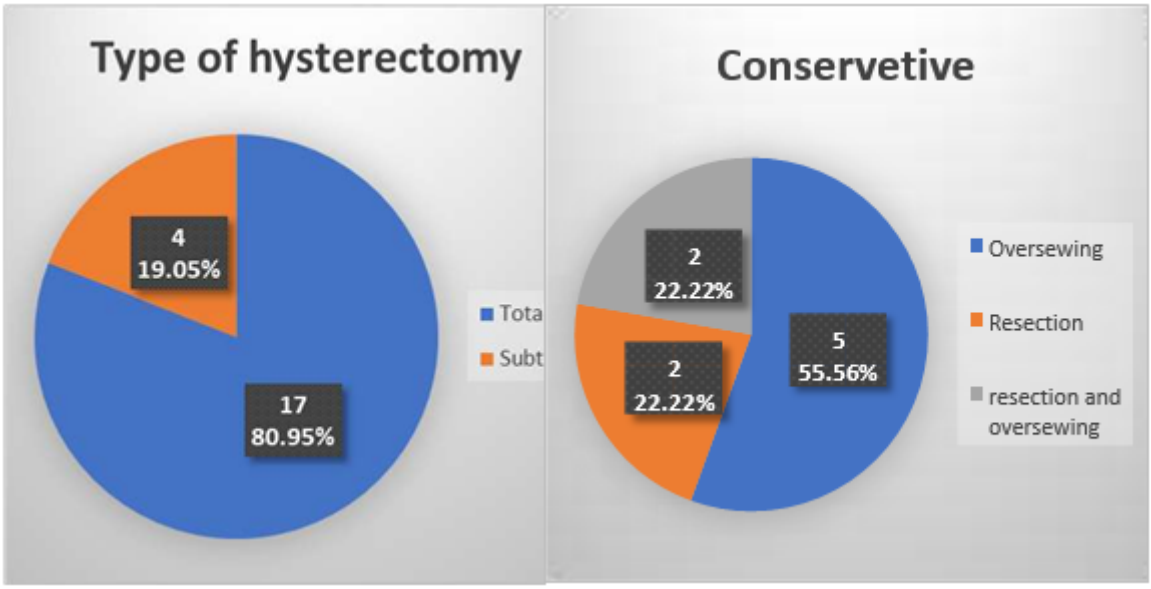

Figure 5: Type of surgery.

Both length of surgery and hospital stay were significantly lower in cases of uterine conserving surgery than hysterectomy as shown in Table 6

Table 6: operative time and hospital stay.

Variables	Hysterectomy		Conservative		P Value
	Mean	SD	Mean	SD	
OP ti me (minutes)	173.62	41.17	141.44	30.71	**0.028**
hospital stay (days)	5.89	1.05	4.71	1.42	**0.021**

The neonatal outcome was not different between the two groups in the term of NICU admission rate and neonatal death, as shown in Table 7.

Table 7: Neonatal outcome.

Variables		Hysterectomy		Conservative		P Value
		No.	%	No.	%	
NICU	**Yes**	17	81	7	77.8	0.842
	No	4	19	2	22.2	
Neonatal death	**Yes**	4	19	1	11.1	0.286
	No	17	81	8	88.9	

4. Discussion

The worldwide incidence of placenta accreta spectrum (PAS) is rapidly increasing, following the trend of rising cesarean delivery. PAS is an heterogeneous condition associated with a high maternal morbidity and mortality rate, presenting unique challenges in its diagnosis and management[65].

The current study aimed to investigate the outcomes of different modalities in the treatment of PAS at Elwiya hospital as Elwiya hospital which is a secondary hospital serves Rusafa district.

Total number of deliveries during the period from 1st of January 2022 to 1st of October 2022 at Al-Elwiya hospital were 10377 deliveries, number of caesarean section scars were 4118, placenta accrete were 30 cases.

Thirty cases were enrolled in the study, and according to modality of treatment they were divided into hysterectomy group (n=21) and uterine conserving group (n=9).

The patients' demographics were not different between the two groups, this result would increase the internal validity of the study by eliminating the effect of these factors on the maternal and neonatal outcomes.

Mean maternal age was not different between the two groups. To note that previous studies showed that advancing maternal age had both increased incidence of PAS and increased morbidity as stated by Badr et al[66].

The maternal BMI was not different between the two groups, Vieira et al[67] found that obese women had higher rate of PAS. Shrestha et al[68] found that maternal morbidity tend to increase with maternal BMI.

The Gravidity, parity and miscarriage were not different between the two groups. To note that the incidence of PAS increase with increased rate of parity especially in cases of operative delivery, also miscarriage associated with increased rate of abnormal placentation as stated by El Gelany et al[39].

The previous medical and surgical histories were not different between the two groups that also increase the internal validity of the study.

The number of previous C/S was not different between the two groups, previous studies showed that the incidence of PAS tend to increase after repeated C/S delivery, as found by Bukhari et al[69].

Previous uterine surgery was not different between the two groups, but to note that uterine scaring could be one of the etiologies of PAS, as stated by Kapoor et al[70].

History of previous PAS is a major risk for development of accreta in the as found by Hecht et al[71], the current study no difference in the mode of treatment was found.

Previous medical conditions diabetes and hypertension were not different between the two groups. But both associated with increased maternal morbidity in cases of PAS, as found by Vestal et al[72].

Regarding presentation of placenta accreta, not all cases diagnosed prenatally as many cases diagnosed at time of delivery. The presentation was not different between the two groups. Flores-Mendoza et al[73] found that emergency presentation associated with worse outcome.

The presenting complaints were not different between the two groups. Vaginal bleeding in cases of PAS were most likely due to low lying placenta as found by Morlando et al[65] as in our study .

The site of placentation was not different between the two groups, and the most common site of placentation was anteriorly with being low lying placenta.

Similarly found by Shainker et al[74].

Cases of PAS associate with increased rate of adhesions as stated by Matsuzaki et al[75] in their meta-analysis. Cervical varicosities also tend to increase in cases of PAS as found by Ishibashi et al[76]. Dehiscent scar could be a co-existing pathology with PAS as suggested by Einerson et al[77]. The current study is no different regarding the choice of management modality regarding these intra-operative findings.

Regarding the outcome of the different modalities of management, the cases needed hysterectomies were associated with a higher rate of bladder injury and bowel injury than uterine conserving surgery, this could be attributed to difficult dissection in these conditions or due to the invasion of

the placenta to urinary bladder, where selection of hysterectomy to be more reasonable. Similar result found by Chevalier et al[78]

Four cases of ureteric injury found in the study, yet no statistical difference was found, Matsuzaki et al[75] and Chevalier et al[78] found that higher rate of ureteric injury in cases of hysterectomy than uterine conserving surgery. This difference may be attributed to the small sample size used in the current study (higher type II error).

The rate of bowel injury was not different between the two groups, as 4 cases developed bowel injury found that uterine conserving surgery tend to have less risk of bowel injury than hysterectomy.

The amount of blood products required for cases of hysterectomy was significantly higher than uterine conserving surgery. This result was supported by the similar findings in the previous studies (Sentilhes et al[79], Matsuzaki et al[75] and Chevalier et al[78]).

Second intervention was required in three cases, the first case was 34 years old female who undergone uterine conservating surgery that complicated with post operative vaginal bleeding, the other two cases vaginal had post operative bleeding after doing subtotal hysterectomy they needed total abdominal hysterectomy.

The requirement of ICU admission was not different between the two groups (to note that all cases in current study required highly dependency unit and only few cases required ICU admission, yet due to the unavailability of HDU in our hospital all cases were admitted to ICU), Pineles et al[80] found that cases of hysterectomy were more likely to require ICU admission than uterine conserving surgeries.

Sentilhes et al reported total blood loss, any blood product transfusion, adjacent organ injury, and nonpostpartum hemorrhage-related severe maternal morbidity were lower with conservative management than with cesarean hysterectomy, similar results found by us[79].

The mean operative time and mean hospital stay were significantly higher in cases of hysterectomy. Similar result found by Sentilhes et al[79].

The type of hysterectomy used was mainly total hysterectomy than subtotal. Slaoui et al[81] found in their case series that subtotal hysterectomy could be safe alternative to hysterectomy and even associated with decreased women morbidity.

The conservating treatment was used mainly oversewing, sometimes excision of the adherent segment with oversewing done.

The neonatal outcome was not different between the two groups. 19%neonatal death in cases with hysterectomy and 11% neonatal death in cases treated with conservative management mainly due to preterm.

To note that PAS associated with poor neonatal outcome generally as found by Jaunia-ux et al[82].

Conclusion & Recommendations

CONCLUSION

- Prevalence of placenta accrete in Elwiya hospital during period of our hospital 0.28% from total deliveries, 0.72% from total caesarean section.
- Mean gestational age of presentation 34-35 weeks of gestation associated with poor neonatal outcome.
- Uterine conserving surgery is associated with lower rate of bladder injury, bowel injury, ureteric injury, lower requirement of blood transfusion, shorter operative time and hospital stay.
- 1case of maternal death.

RECOMMENDATION

- Health education to the mother about the risk of high gravidity rate and the risk of PAS associated with higher number of cs.
- Better antenatal care and prediction of PAS before surgery.
- Choosing site of scar in uterus in cases of PAS (upper segment without separation of placenta) after doing proper separation of bladder.
- Trial of uterine conserving surgery could help in reducing morbidity and mortality in cases of PAS according to individual.
- Training of the staff.

REFERENCES

1. Berhan Y, Urgie T. A Literature Review of Placenta Accreta Spectrum Disorder: The Place of Expectant Management in Ethiopian Setup. Ethiop J Health Sci. 2020;30(2):277-92.
2. Bailit JL, Grobman W, Rice MM, Reddy UM, Wapner RJ, Varner MW, et al. Morbidly adherent placenta treatments and outcomes. Obstetrics and gynecology. 2015;125(3):683.
3. Shamshirsaz AA, Fox KA, Salmanian B, Diaz-Arrastia CR, Lee W, Baker BW, et al. Maternal morbidity in patients with morbidly adherent placenta treated with and without a standardized multidisciplinary approach. American journal of obstetrics and gynecology. 2015;212(2):218. e1-. e9.
4. Obstetricians ACo, Gynecologists. Levels of maternal care. Obstetric care consensus no. 2. Obstet Gynecol. 2015;125(2):502-15.
5. Silver RM, Branch DW. Placenta Accreta Spectrum. The New England journal of medicine. 2018;378(16):1529-36.
6. Morlando M, Collins S. Placenta accreta spectrum disorders: challenges, risks, and management strategies. International Journal of Women's Health. 2020;12:1033.
7. Cahill AG, Beigi R, Heine RP, Silver RM, Wax JR. Placenta Accreta Spectrum. American Journal of Obstetrics and Gynecology. 2018;219(6):B2-B16.
8. Shabila NP. Trends and changes in cesarean delivery rates in Iraq: findings from the multiple indicator cluster surveys, 2011–2018. The Journal of Maternal-Fetal & Neonatal Medicine. 2021:1-6.
9. Khaliq Showman HA, Alizzi FJ, Helmi ZR, Ismael VA, Fawzi HA. Placenta accrete spectrum disorders: A single centre experience over four years in the view of international guidelines. J Pak Med Assoc. 2019;69(Suppl 3)(8):S68-s72.
10. Farquhar CM, Li Z, Lensen S, McLintock C, Pollock W, Peek MJ, et al. Incidence, risk factors and perinatal outcomes for placenta accreta in Australia and New Zealand: a case–control study. BMJ open. 2017;7(10):e017713.
11. Heller DS. The Placenta Accreta Spectrum. In: Baergen RN, Burton GJ, Kaplan CG, editors. Benirschke's Pathology of the Human Placenta. Cham: Springer International Publishing; 2022. p. 271-80.
12. Carusi DA. The Placenta Accreta Spectrum: Epidemiology and Risk Factors. Clinical obstetrics and gynecology. 2018;61(4):733-42.
13. Baldwin HJ, Nippita TA, Torvaldsen S, Ibiebele I, Ford JB, Patterson JA. Outcomes of Subsequent Births After Placenta Accreta Spectrum. Obstetrics & Gynecology. 2020;136(4).

14. Takeshima K, Jwa SC, Saito H, Nakaza A, Kuwahara A, Ishihara O, et al. Impact of single embryo transfer policy on perinatal outcomes in fresh and frozen cycles—analysis of the Japanese Assisted Reproduction Technology registry between 2007 and 2012. Fertility and Sterility. 2016;105(2):337-46. e3.
15. Karami M, Jenabi E, Fereidooni B. The association of placenta previa and assisted reproductive techniques: a meta-analysis. The Journal of MaternalFetal & Neonatal Medicine. 2018;31(14):1940-7.
16. Kaser DJ, Melamed A, Bormann CL, Myers DE, Missmer SA, Walsh BW, et al. Cryopreserved embryo transfer is an independent risk factor for placenta accreta. Fertility and sterility. 2015;103(5):1176-84. e2.
17. Rombauts L, Motteram C, Berkowitz E, Fernando S. Risk of placenta praevia is linked to endometrial thickness in a retrospective cohort study of 4537 singleton assisted reproduction technology births. Human reproduction. 2014;29(12):2787-93.
18. Chen L, Zhang H, Wang Q, Xie F, Gao S, Song Y, et al. Reproductive Outcomes in Patients With Intrauterine Adhesions Following Hysteroscopic Adhesiolysis: Experience From the Largest Women's Hospital in China. Journal of Minimally Invasive Gynecology. 2017;24(2):299-304.
19. Diag FPA, Jauniaux E, Chantraine F, Silver RM, Langhoff-Roos J, Tikkanen M. FIGO consensus guidelines on placenta accreta spectrum disorders: epidemiology. 2018.
20. Jauniaux E, Collins S, Burton GJ. Placenta accreta spectrum: pathophysiology and evidence-based anatomy for prenatal ultrasound imaging. American journal of obstetrics and gynecology. 2018;218(1):7587.
21. Liu X, Wang Y, Wu Y, Zeng J, Yuan X, Tong C, et al. What we know about placenta accreta spectrum (PAS). European Journal of Obstetrics & Gynecology and Reproductive Biology. 2021;259:81-9.
22. Jauniaux E, Jurkovic D. Placenta accreta: pathogenesis of a 20th century iatrogenic uterine disease. Placenta. 2012;33(4):244-51.
23. Jauniaux E, Jurkovic D, Hussein AM, Burton GJ. New insights into the etiopathology of placenta accreta spectrum. American Journal of Obstetrics and Gynecology. 2022.
24. Jauniaux E, Burton GJ. Pathophysiology of placenta accreta spectrum disorders: a review of current findings. Clinical obstetrics and gynecology. 2018;61(4):743-54.
25. Ali H, Chandraharan E. Etiopathogenesis and risk factors for placental accreta spectrum disorders. Best Practice & Research Clinical Obstetrics & Gynaecology. 2021;72:4-12.
26. Shamshirsaz A, Fox K, Salmanian B, Diaz-Arrastia C, Lee W, Baker B, et al. Maternal morbidity in patients with morbidly adherent placenta treated with and without a standardized multidisciplinary approach. Obstetric Anesthesia Digest. 2016;36(1):31-2.
27. Veludandi U, Suman BA, Nagamani S, Hothur M. Evaluation of outcome of pregnancy in placenta accreta spectrum. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2021;10(9):3331-6.
28. Comstock C, Bronsteen R. The antenatal diagnosis of placenta accreta. BJOG: An International Journal of Obstetrics & Gynaecology. 2014;121(2):171-82.
29. Cali G, Forlani F, Lees C, Timor-Tritsch I, Palacios-Jaraquemada J, Dall'Asta A, et al. Prenatal ultrasound staging system for placenta accreta spectrum disorders. Ultrasound in Obstetrics & Gynecology. 2019;53(6):752-60.
30. Silver RM, Branch DW. Placenta accreta spectrum. New England Journal of Medicine. 2018;378(16):1529-36.

31. D'antonio F, Iacovella C, Bhide A. Prenatal identification of invasive placentation using ultrasound: systematic review and meta-analysis. Ultrasound in Obstetrics & Gynecology. 2013;42(5):509-17.

32. Romeo V, Verde F, Sarno L, Migliorini S, Petretta M, Mainenti PP, et al. Prediction of placenta accreta spectrum in patients with placenta previa using clinical risk factors, ultrasound and magnetic resonance imaging findings. La radiologia medica. 2021;126(9):1216-25.

33. Silver RM, Fox KA, Barton JR, Abuhamad AZ, Simhan H, Huls CK, et al. Center of excellence for placenta accreta. American journal of obstetrics and gynecology. 2015;212(5):561-8.

34. Jauniaux E, Ayres-de-Campos D, Langhoff-Roos J, Fox KA, Collins S, Diagnosis FPA, et al. FIGO classification for the clinical diagnosis of placenta accreta spectrum disorders. International Journal of Gynecology & Obstetrics. 2019;146(1):20-4.

35. Silver RM, Lyell DJ. Placenta accreta spectrum. Protocols for High_ Risk Pregnancies: An Evidence_ Based Approach. 2020:571-80.

36. Gyamfi-Bannerman C, Medicine SfM-F. Society for Maternal-Fetal Medicine (SMFM) Consult Series# 44: Management of bleeding in the late preterm period. American journal of obstetrics and gynecology. 2018;218(1):B2-B8.

37. Obstetricians ACo, Gynecologists. Antenatal corticosteroid therapy for fetal maturation: Committee opinion No. 713. Obstet Gynecol. 2017;130(2):102-9.

38. Shamshirsaz AA, Fox KA, Erfani H, Clark SL, Shamshirsaz AA, Nassr AA, et al. Outcomes of planned compared with urgent deliveries using a multidisciplinary team approach for morbidly adherent placenta. Obstetrics & Gynecology. 2018;131(2):234-41.

39. El Gelany S, Mosbeh MH, Ibrahim EM, Mohammed Mm, Khalifa EM, Abdelhakium AK, et al. Placenta Accreta Spectrum (PAS) disorders: incidence, risk factors and outcomes of different management strategies in a tertiary referral hospital in Minia, Egypt: a prospective study. BMC pregnancy and childbirth. 2019;19(1):1-8.

40. Salim R, Chulski A, Romano S, Garmi G, Rudin M, Shalev E. Precesarean prophylactic balloon catheters for suspected placenta accreta: a randomized controlled trial. Obstetrics & Gynecology. 2015;126(5):1022-8.

41. Cho SB, Hong SJ, Lee S, Won JH, Choi HC, Ha JY, et al. Preoperative prophylactic balloon-assisted occlusion of the internal iliac arteries in the management of placenta Increta/Percreta. Medicina. 2020;56(8):368.

42. Warshak CR, Ramos GA, Eskander R, Benirschke K, Saenz CC, Kelly TF, et al. Effect of predelivery diagnosis in 99 consecutive cases of placenta accreta. Obstetrics & Gynecology. 2010;115(1):65-9.

43. Ross ME, Alston MJ. Placenta Accreta: A Practical Review. Topics in Obstetrics & Gynecology. 2020;40(5):1-5.

44. 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):291-8.

45. Shabana A, Fawzy M, Refaie W. Conservative management of placenta percreta: a stepwise approach. Archives of gynecology and obstetrics. 2015;291(5):993-8.

46. Teixidor Viñas M, Belli A, Arulkumaran S, Chandraharan E. Prevention of postpartum hemorrhage and hysterectomy in patients with morbidly adherent placenta: a cohort study comparing outcomes before and after introduction of the Triple-P procedure. Ultrasound in Obstetrics & Gynecology. 2015;46(3):350-5.

47. Li G-T, Li X-F, Wu B, Li G. Longitudinal parallel compression suture to control postopartum hemorrhage due to placenta previa and accrete. Taiwanese Journal of Obstetrics and Gynecology. 2016;55(2):193-7.

48. Sud S, Dwivedi D, Singh S, Gautam AR. Multidisciplinary approach with favorable outcome in management of placenta accreta. Journal of Obstetric Anaesthesia and Critical Care. 2020;10(2):147.

49. Panigrahi AK, Yeaton-Massey A, Bakhtary S, Andrews J, Lyell DJ, Butwick AJ, et al. A standardized approach for transfusion medicine support in patients with morbidly adherent placenta. Anesthesia & Analgesia. 2017;125(2):603-8.

50. Shakur H, Roberts I, Fawole B, Chaudhri R, El-Sheikh M, Akintan A, et al. Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial. The Lancet. 2017;389 (10084): 2105-16.

51. Belete M, Gerrans E, Keskar M. Blood management in post-partum haemorrhage, including point of care coagulation tests. Signa Vitae. 2021;1:7.

52. Cahill AG, Beigi R, Heine RP, Silver RM, Wax JR, Obstetricians ACo, et al. Placenta accreta spectrum. American journal of obstetrics and gynecology. 2018;219(6): B2-B16.

53. Joshi VM, Otiv SR, Sovani YB, Kulat PK. Aortic clamping for limiting blood loss at cesarean hysterectomy for placenta percreta: A case series. International Journal of Gynecology & Obstetrics. 2021.

54. Guo Z, Han X, Zhang H, Zheng W, Yang H, Ma J. Association Between Pre-delivery Coagulation Indicators and Invasive Placenta Accreta Spectrum. Clinical and Applied Thrombosis/Hemostasis. 2022;28:10760296211070580.

55. Mori K, Obata-Yasuoka M, Saida T, Nishida K, Takahashi H, Hosokawa Y, et al. Pelvic arterial embolisation with cyanoacrylate during caesarean hysterectomy for placenta accreta. Minimally Invasive Therapy & Allied Technologies. 2022;31(3):396-403.

56. Erfani H, Fox KA, Clark SL, Rac M, Hui S-KR, Rezaei A, et al. Maternal outcomes in unexpected placenta accreta spectrum disorders: single-center experience with a multidisciplinary team. American journal of obstetrics and gynecology. 2019;221(4):337. e1-. e5.

57. Palacios-Jaraquemada JM, Fiorillo A, Hamer J, Martínez M, Bruno C. Placenta accreta spectrum: a hysterectomy can be prevented in almost 80% of cases using a resective-reconstructive technique. The Journal of Maternal-Fetal & Neonatal Medicine. 2022;35(2): 275-82.

58. Touhami O, Allen L, Mendoza HF, Murphy MA, Hobson SR. Placenta accreta spectrum: a non-oncologic challenge for gynecologic oncologists. International Journal of Gynecologic Cancer. 2022:ijgc-2021-003325.

59. Fox KA, Shamshirsaz AA, Carusi D, Secord AA, Lee P, Turan OM, et al. Conservative management of morbidly adherent placenta: expert review. American journal of obstetrics and gynecology. 2015;213(6):755-60.

60. Pala Ş, Atilgan R, Başpınar M, Kavak EÇ, Yavuzkır Ş, Akyol A, et al. Comparison of results of Bakri balloon tamponade and caesarean hysterectomy in management of placenta accreta and increta: a retrospective study. Journal of Obstetrics and Gynaecology. 2018;38(2):194-9.

61. Sentilhes L, Ambroselli C, Kayem G, Provansal M, Fernandez H, Perrotin F, et al. Maternal outcome after conservative treatment of placenta accreta. Obstetrics & Gynecology. 2010;115(3): 526-34.

62. Ramoni A, Strobl EM, Tiechl J, Ritter M, Marth C. Conservative management of abnormally invasive placenta: four case reports. Acta obstetricia et gynecologica Scandinavica. 2013;92(4):468-71.

63. Legendre G, Zoulovits FJ, Kinn J, Senthiles L, Fernandez H. Conservative management of placenta accreta: hysteroscopic resection of retained tissues. Journal of minimally invasive gynecology. 2014;21(5):910-3.

64. Lee PS, Kempner S, Miller M, Dominguez J, Grotegut C, Ehrisman J, et al. Multidisciplinary approach to manage antenatally suspected placenta percreta: updated algorithm and patient outcomes. Gynecologic Oncology Research and Practice. 2017;4(1):1-11.

65. Morlando M, Collins S. Placenta Accreta Spectrum Disorders: Challenges, Risks, and Management Strategies. Int J Womens Health. 2020;12:1033-45.

66. Badr DA, Al Hassan J, Wehbe GS, Ramadan MK. Uterine body placenta accreta spectrum: A detailed literature review. Placenta. 2020;95:44-52.

67. Vieira MC, Rijken MJ, Braun T, Chantraine F, Morel O, Schwickert A, et al. The relation between maternal obesity and placenta accreta spectrum: A multinational database study. Acta Obstetricia et Gynecologica Scandinavica. 2021;100:50-7.

68. Shrestha KS, Salmanian B, Einerson BD, Carusi DA, Shainker SA, NietoCalvache AJ, et al. The association of increasing maternal body mass index on placenta accreta spectrum disorders. American Journal of Obstetrics & Gynecology. 2023;228(1): S674-S5.

69. Bukhari N, Nazneen S, Mazhar T, Karim R. THE RELATIONSHIP OF PLACENTA ACCRETA SPECTRUM WITH PREVIOUS CESAREAN SECTION IN PATIENTS WITH PLACENTA PREVIA-A CASECONTROL STUDY IN TERTIARY CARE HOSPITAL OF PESHAWAR. Journal of Medical Sciences. 2022;30(04):280-3.

70. Kapoor H, Hanaoka M, Dawkins A, Khurana A. Review of MRI imaging for placenta accreta spectrum: pathophysiologic insights, imaging signs, and recent developments. Placenta. 2021;104:31-9.

71. Hecht JL, Baergen R, Ernst LM, Katzman PJ, Jacques SM, Jauniaux E, et al. Classification and reporting guidelines for the pathology diagnosis of placenta accreta spectrum (PAS) disorders: recommendations from an expert panel. Modern Pathology. 2020;33(12):2382-96.

72. Vestal NL, Sangara RN, Mandelbaum RS, Matsuzaki S, McCarthy LE, Matsushima K, et al. Racial and ethnic disparity in characteristics and outcomes of women with placenta accreta spectrum: a comparative study. Reproductive Sciences. 2022;29 (7):1988-2000.

73. Flores_ Mendoza H, Chandran AR, Hernandez-Nieto C, Murji A, Allen L, Windrim RC, et al. Outcomes in emergency versus electively scheduled cases of placenta accreta spectrum disorder managed by cesarean _hysterectomy within a multidisciplinary care team. International Journal of Gynecology & Obstetrics. 2022.

74. Shainker SA, Coleman B, Timor-Tritsch IE, Bhide A, Bromley B, Cahill AG, et al. Special Report of the Society for Maternal-Fetal Medicine Placenta Accreta Spectrum Ultrasound Marker Task Force: Consensus on definition of markers and approach to the ultrasound examination in pregnancies at risk for placenta accreta spectrum. American Journal of Obstetrics and Gynecology. 2021;224 (1):B2-B14.

75. Matsuzaki S, Ueda Y, Nagase Y, Matsuzaki S, Kakuda M, Kakuda S, et al. Placenta Accreta Spectrum Disorder Complicated with Endometriosis: Systematic Review and Meta-Analysis. Biomedicines. 2022;10(2):390.

76. Ishibashi H, Miyamoto M, Shinmoto H, Soga S, Matsuura H, Kakimoto S, et al. The use of magnetic resonance imaging to predict placenta previa with placenta accreta spectrum. Acta Obstetricia et Gynecologica Scandinavica. 2020;99(12):1657-65.

77. Einerson BD, Comstock J, Silver RM, Branch DW, Woodward PJ, Kennedy A. Placenta Accreta Spectrum Disorder: Uterine Dehiscence, Not Placental Invasion. Obstetrics & Gynecology. 2020;135(5):1104-11.

78. Chevalier G, Devisme L, Coulon C. [Placenta accreta spectrum disorder: Management and morbidity in a French type-3 maternity]. Gynecologie, obstetrique, fertilite & senologie. 2020;48(6):500-5.

79. Sentilhes L, Seco A, Azria E, Beucher G, Bonnet M-P, Branger B, et al. Conservative management or cesarean hysterectomy for placenta accreta spectrum: the PACCRETA prospective study. American Journal of Obstetrics and Gynecology. 2022;226(6):839.e1-.e24.

80. Pineles BL, Sibai BM, Sentilhes L. Is conservative management of placenta accreta spectrum disorders practical in the United States? American Journal of Obstetrics & Gynecology MFM. 2022:100749.

81. Slaoui A, Talib S, Nah A, Moussaoui KE, Benzina I, Zeraidi N, et al. Placenta accreta in the department of gynaecology and obstetrics in Rabat, Morocco: case series and review of the literature. Pan Afr Med J. 2019;33:86.

82. Jauniaux E, Bunce C, Grønbeck L, Langhoff-Roos J. Prevalence and main outcomes of placenta accreta spectrum: a systematic review and metaanalysis. American Journal of Obstetrics and Gynecology. 2019;221(3):20818.