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AOGD BULLETIN

Women's Health to New Horizons

Theme: Morbidly Adherent Placenta

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Message from the President

Dear friends

The valentine's month is here, and matters of heart are to be dealt with tenderness, love and care. In India, women are more at risk of heart disease today than three years ago. More and more number of young people are suffering from coronary artery disease, owing to their poor lifestyle. Many studies reveal that 3 in 5 women in India are at high risk of cardiovascular disease as early as 35 years of age. With data showing such alarming results, it is important to take the necessary preventive measure and raise awareness. National Wear Red day is a popular day celebrated in America on the 3rd of February. But it is a great international platform to show support and spread awareness about the fact that heart disease is a major cause of mortality in women.

International world cancer day is marked on 4th of February to raise awareness of cancer and to encourage its prevention, detection, and treatment. The two most common malignancies in women being breast and cervical cancer, prevention and early diagnosis can substantially reduce the mortality associated with them. Many lives can be saved every year by implementing resource strategies, for prevention, early detection and treatment. It is the critical need of the hour for women to be educated about the risk factors, preventive strategies and importance of screening in order to reduce the burden of disease and save women lives.

Our association strives to educate the women and spread consciousness amongst all strata of the society regarding healthy lifestyle, and alertness of the alarming signs of malignancies. We should all pledge and take an opportunity this month by holding hands and increasing awareness.

Dr Sudha Prasad
President
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From the Secretary's Desk

Dear Members,

Namaskar ! Greetings from AOGD Maulana Azad Medical College & Lok Nayak Hospital. I along with my joint secretaries Dr Poonam Sachdeva, Dr Poonam Kashyap and Dr Niharika Dhiman welcome you all.

FOGSI - 60th AICOG conference was a great success with the installation of new FOGSI President Dr Rishma Pai. Many AOGDians participated in various roles and brought honors. AOGD congratulates each and every one for their endeavors.

There are many activities by the various subcommittees of AOGD in coming months. The details are there on the website (www.aogd.org) and in the bulletin. You are requested to participate in monthly clinical meetings which are organized after putting up lots of hard work. We all should appreciate the efforts put behind in the organization of any academic event by actively attending it in large numbers.

Nominations for President, Vice-President and Chairperson of various subcommittees of AOGD are being invited. All details are available on the website as well as in the bulletin of January and February, 2017.

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From the Editor's Pen

Dear friends

Greetings from the Editorial Team! It is indeed a pleasure to bring forth our next issue for all of you. Your valuable feedback gives us direction and helps us to deliver our best.

This issue of the bulletin deals with one of the deadliest challenge faced by obstetricians today worldwide, that is pregnancy complicated by morbidly adherent placenta. The reported incidence of placenta accreta has increased from approximately 0.8 per 1000 deliveries in the 1980s to 3 per 1000 deliveries in the past decade. This nightmare has knocked our doors due to injudicious and indiscriminate use of cesarean section. Preventive strategies primarily include critical selection of cesarean section for the first time and advocating VBAC/TOLAC.

Antepartum diagnosis of placenta accrete allows multidisciplinary planning in an attempt to minimize potential maternal or neonatal morbidity and mortality. In general, the recommended management of suspected placenta accreta is planned cesarean hysterectomy with the placenta left in situ because attempts at removal of the placenta are associated with significant hemorrhagic morbidity. Although current evidence is insufficient to make a recommendation on the use of balloon catheter occlusion or embolization to reduce blood loss and improve surgical outcome, but individual situations may warrant their use. The recently described Triple-P procedure warrants further investigation and the logistics limit its application in most of the centres.

It is important to reiterate that high degree of clinical suspicion in patients with combination of scarred uterus and placenta previa will aid prenatal diagnosis. Timely referral to a centre equipped to manage these cases is key factor in mimimising adverse outcomes.

As rightly said by James Douglas *"Care shouldn't start in the emergency room"*, appropriate preoperative workup and planning can optimize maternal outcome in these cases.

Dr Sangeeta Gupta
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CHANGE IN DATE

Monthly Clinical Meeting

Monthly Clinical Meeting will be held at ESI Hospital Basai Darapur, New Delhi on **3rd March, 2017** at 4:00pm.

Rising Incidence of Placenta Accreta: What are we heading upto?

Vidushi Kulshrestha
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Introduction

The term placenta accreta or placenta accrete syndrome is used to describe a spectrum of an abnormal placental implantation and firm adherence which are classified according to the depth of invasion into the uterus. These include placenta accreta when chorionic villi are adhered to the myometrium with no intermediate decidual layers, increta when the villi invades into the myometrium and percreta when villi completely penetrates the myometrium reaching serosa with or without breaching serosa and invading the surrounding structures, such as the bladder, broad ligament, or sigmoid colon.[1,2] So the term placenta accrete is used to describe a single pathological entity as well as a generic term for the disease spectrum.

These are further described on basis of the number of lobules involved as total placenta accrete involving all lobules, partial placenta accrete involving at least two but not all lobules and focal placenta accreta involving only a single lobule.[2] The ratio of occurrence of the three variants in clinical practice is approximately 80:15:5, respectively.[3] The variant accreta has also been described as placenta creta or placenta vera by some authors.[4]

Pathophysiology of placenta accreta

The proposed mechanisms include defective decidua, excessive trophoblastic invasion, or their combination. Partial or total absence of the decidua basalis and defective development of the fibrinoid or Nitabuch layer results in abnormally firm adherence to myometrium as the physiological line of cleavage is absent.[1] Or there can be a defect of the biological functions of the trophoblast, leading to excessive invasion of the myometrium.[5]

Recently deeper invasion of trophoblast into the myometrium and infiltration of chorionic villi into myometrial vascular spaces has been documented in increta and percreta.[6]

These changes provoke a shift in placental blood supply from a spiral artery as found in normal placentation to a supply from larger, deeper radial or arcuate arteries in abnormally invasive placentas. These major transformations of the uteroplacental circulation result in blood entering the placenta at high velocity forming placental blood lacunae and hypervascularization patterns under the placental bed found on colour Doppler ultrasound.[7]

Any factor that disrupts decidua basalis with subsequent defective or absent decidualization, altering local microenvironment at the future implantation site.[8] This allows for abnormally deep implantation of the chorionic villi directly upon the myometrium manifested clinically by the inability to separate the placenta from the uterine wall at the time of delivery or placenta accrete.

Endometrial stem/progenitor cells exist throughout the endometrium to allow for sufficient tissue regeneration in response to estrogen following menstruation and parturition. Deep trauma involving the basal layer and underlying myometrium may damage these resident stem cells necessary to repair the epithelium without scarring.[9] Perhaps deeper and larger areas of myometrial damage overwhelms the ability of these cells to properly regenerate and repair the endometrium overlying these myometrial defects leading to the development of a thin, dysfunctional endometrium or even fibrosis and scar The ability of these cells to regenerate the damaged endometrium may further be hindered during the typically estrogen-poor postpartum period.[10] Implantation in a prior site of defective decidualization leads to a higher risk of placenta accrete development.

Incidence

The likelihood of placenta accrete syndrome is linked to prior uterine surgery. The incidence of placenta accreta is rising, primarily because of the rise in cesarean rates and advancing maternal age. Cesareans as a cause for increased incidence of placenta accrete in recent years was declared by the International Federation of Placenta Associations in 2011.[8] The cited incidence of placenta accreta was 1 in 2500 in the 1980s[1] which has risen to 1 in 533 deliveries[11]

Infact, placenta accreta has been termed as the iatrogenic 20th century disorder of human placentation.[4] The inclusion of the three different grades of accreta placentation into one category has

led to heterogeneous data which explains the reported variability in terms of prenatal diagnosis accuracy, outcome, and management at various centers.

Risk factors for placenta accreta

Any insult to the integrity of the uterine lining by prior surgery, infection etc. can potentially cause placenta accreta in subsequent pregnancy. The two most important risk factors are previous cesarean and placenta previa among the following:

Previous cesarean delivery: Previous cesarean delivery alone, without previa, is also an independent risk factor for accreta with increasing incidence associated with increasing number of cesareans: 0.2% for the first, 0.3% for second, 0.6% for third, 2.1% with the fourth, and up to 6.7% with the sixth or greater.[12] Risk of accreta is higher in a previous classic cesarean[13] and is also more after emergency than an elective cesarean. Since the incidence of placenta accreta appears to be increasing parallel to the rising cesarean rates, the scarring of the uterine wall by previous cesarean is the most important risk factor leading to abnormal placentation.

Placenta previa: Placenta previa alone without previous uterine surgery is associated with a 5-10% risk of accreta.[14,15] But the risk increases drastically in presence of previous cesareans.

Combination of placenta previa and prior cesareans: The highest risk factor for placenta accrete is placenta previa in the presence of uterine scar and increases with the number of previous cesareans. Reported risk of accrete in placenta previa with prior one, two, three four, and five or more cesarean delivery is 3.3%, 11%, 40%, 61%, and 67% respectively.[12] Thus, identifying placenta previa during the second trimester on ultrasound in a woman with a history of prior cesareans should prompt appropriate imaging for prenatal diagnosis of accreta and its grade. Pernicious placenta previa is a term to define placenta previa attached to previous cesarean delivery scars and is a risk factor for accreta.[16]

Prior uterine surgery or curettage or intervention: Previous history of uterine curettage, history of manual delivery of the placenta, hysteroscopic surgery such as endometrial resection, endometrial ablation are associated with increased risk of accrete. A prior myomectomy is not associated with higher risk of accreta.[12]

Previous uterine artery embolization (UAE): Placenta accreta is reported after UAE done for managing postpartum hemorrhage in previous pregnancy, highlighting the importance of antenatal evaluation of placentation in subsequent pregnancies in women with history of UAE.[17]

Postpartum endometritis: causes defective decidualization and increases the risk of accreta in future pregnancies.

Uterine pathology: Bicornuate uterus, adenomyosis, submucous fibroids, Asherman syndrome even in absence of previous uterine surgery increases the risk of placenta accreta.

Cesarean scar pregnancy (CSP): Recent studies have suggested CSP as a precursor of placenta accrete which usually present prior to viability. CSP describes implantation within the myometrium of a prior cesarean delivery scar and is clinically similar to an ectopic pregnancy. Reported incidence is approximately 1 in 2000 pregnancies. CSP has similar risk for serious hemorrhage as accreta.[18] Presently, it is unknown if the incidence increases with multiple cesareans or if it is related to one- or two-layer uterine incision closure.[1]

In vitro fertilization pregnancies (IVF): An increase in placenta accreta has also been seen in IVF pregnancies.[19]

Maternal age: Advanced maternal age is also a reported independent risk factor for accreta with the risk increasing for every year beyond 20 years of age.[11]

Others: Multiparity, uterine irradiation and even prior placenta accreta increases the risk of accreta. Antecedent 'constitutional endometrial defect' has also been described[20] which might explain rare occurrence of focal accreta in absence of risk factors.

Few recently associated risk factors are as follows:

Elevated first trimester PAPP-A: Elevated first trimester PAPP-A among women with placenta previa is a strong risk factor for placenta accreta.[21]

Elevated second trimester maternal serum alphafetoprotein (MSAFP) and maternal free beta human chorionic gonadotropin levels: MSAFP and β-hCG as a risk factor became apparent with widespread use of these markers for second trimester screening aneuploidy screening. Reported increase in the risk for accrete syndromes was eightfold with MSAFP levels > 2.5 MoM and fourfold with maternal free β-hCG levels > 2.5 MoM.[1,21,22]

Maternal cell-free β-hCG mRNA: Elevated cell-free β-hCG mRNA in the maternal plasma of women with placenta accreta may arise from direct uteroplacental transfer of cell-free placental mRNA and may be

applicable for prenatal diagnosis.[23]

Decreased TNF-related apoptosis inducing ligand (TRAIL) receptor levels: An intricate balance between extra-villous trophoblastic proliferation and apoptosis, that is, the programmed cell death is a crucial factor in normal placental development. Any disturbance of this balance between proliferation and apoptosis may lead to abnormal placentation. TNFα, Fas ligand and TNF-related apoptosis inducing ligand (TRAIL) trigger apoptosis by binding to the cell surface receptors. TRAIL-type 2 receptors are produced both by decidual and trophoblast cells and a recent study demonstrated that lower levels of TRAIL-R2 and a previous history of cesarean section are associated with placenta accrete, suggesting that decreased apoptosis may contribute to the abnormal placental invasion in placenta previa.[24]

Down-regulation of specific microRNAs: MicroRNAs (miRNAs) constitute a highly conserved class of small non-coding RNAs that regulate gene expression at the post-transcriptional level by modifying expression of targeted mRNAs. During placental development, expression of genes involved in cell differentiation, adhesion, migration, apoptosis, and angiogenesis are all regulated by specific miRNAs. Decreased expression of miR-34a and miR-29a/b/c has been found in placenta accrete, which blocks apoptosis of trophoblast and contributes to pathogenesis of placenta accreta.[25,26]

Myometrial fibers in the basal plate (BPMYO): The presence of myometrial fibers attached to the basal plate in a delivered placenta is associated with an increased risk for placenta accreta in subsequent pregnancy. Focal decidual defects could be generated when a placenta is delivered with BPMYO, potentially leading to inadequate decasualization. BPMYO is not rare, rather it may be a relatively common finding in normal pregnancies; but greater quantity and depth of BPMYO are risk factors for abnormal trophoblast-uterine interactions and subsequent accrete in the next pregnancy.[27]

Complications

Placenta accrete syndrome is associated with increased maternal and fetal morbidity and mortality. With increasing incidence reflecting an increase in cesarean rates, it has become one of the most dreaded obstetric complications. A major cause of morbidity and mortality is postpartum hemorrhage with associated risk of massive blood transfusion, intensive care unit stay, disseminated intravascular coagulation and even maternal death. There is increased risk of peripartum hysterectomy, intraoperative hypotension, related surgical injuries to the ureters or bladder and secondary surgical procedures.[1] Massive hemorrhage can lead to coagulopathy and tissue edema/friability can lead to bleeding not fully controlled after removal of the uterus.[2] Urinary tract injury during cesarean hysterectomy for invasive placenta has been reported to be as high as 29%.[28] There is also increased risk of sepsis, and deep venous thrombosis. Pulmonary edema, acute respiratory distress syndrome, renal failure requiring dialysis, acute tubular necrosis, and, with large transfusions, transfusion-related lung injury have all been reported.[29] Fetal complications include perinatal mortality and low birth weight.[30] The worst clinical outcome arises when placenta accreta is unsuspected at the time of delivery and the surgeon attempts to remove the invasive part of the placenta leading immediately to major hemorrhage and an increasing need for emergency hysterectomy.

Subsequent Pregnancies after an accreta

There is an increased risk for recurrence, uterine rupture, postpartum hemorrhage, hysterectomy and previa in subsequent pregnancies after conservative management retaining the uterus.[30] The odds ratio for recurrence in subsequent deliveries is 15.4 with recurrence rate being 22.8%.[31]

Prevention of placenta accreta

Strategies for primary prevention include prevention of the first caesarean and encouraging trial of labour after caesarean if not contraindicated.[32] Correct surgical technique while closing the uterine incision, avoiding vigorous curettage, prompt treatment of postpartum endometritis may also reduce the risk of accreta.

Potential biomarkers of placenta accreta

Maternal blood alpha-fetoprotein, cell-free placental/fetal DNA, Maternal cell-free β-hCG mRNA, cell-free human placental lactogen mRNA, pregnancy-associated plasma protein A, and creatinine kinase are markers of placental damage or abnormal placentation. Hence these may aid in the diagnosis of placenta accrete in high risk cases, though they are not yet developed as the biomarkers presently.[32]

Placenta accrete syndrome includes morbidly adherent placenta accreta where the villi simply adhere to the myometrium and placenta increta and percreta where villi invades into the myometrium. This is a potentially fatal obstetric condition. Prenatal diagnosis of placenta accrete syndrome is of utmost importance for the safe

management of this increasingly common obstetric complication. This is accomplished by ultrasound with Doppler and MRI if placenta is posterior or if ultrasound findings are inconclusive. Determining the depth of placental invasion on imaging is also crucial to optimize the treatment plan and pregnancy outcome. Placenta accreta is associated with significantly increased maternal and neonatal morbidity and mortality. With each cesarean, the obstetricians are heading towards a potentially fatal iatrogenic complication, hence every obstetrician must be familiar with the diagnostic and treatment options.

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The sub-committee members are requested to intimate activities of the sub-committee to the AOGD secretariat through the chairperson. The form for conducting the activity is available on AOGD website www.aogd.org

The members of AOGD who wish to conduct activities are requested to contact the respective sub-committee chairperson.

Diagnosis of Placenta Accreta - Basics and nuances

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Introduction

Placenta accreta is a broad terminology that is used to describe a spectrum of morbidly adherent placenta which result in a life threatening obstetrical condition. Histopathlogically a placenta in which the chorionic villi invade the decidua basalis is called placenta accreta. Further invasion of the placenta into the myometrium is called placenta increta, and further penetration through the myometrium upto the serosa and adjacent organs like bladder is called placenta percreta. In this article the term placenta accreta will be used in general to describe all the above terminologies.

The incidence of placenta accreta has shown a sharp rise over the years, which may be attributed to rising number of cesarean deliveries. The reported incidence of approximately 0.8 per 1000 deliveries in1980's has increased to 3 per 1000 in the last decade.[1]

Placenta Accreta - an Obstetrical Emergency

An asymptomatic antenatal condition, placenta accreta may result in a life threatening obstetrical emergency when encountered during delivery. It may lead to-

- Massive obstetrical haemorrhage with blood loss to the extent of 3000 ml - 5000 ml.[2]
- Requirement of blood and blood products - almost 90% patients may require tranfusion of blood or blood products.[3]
- Surgical injury to bladder, bowel, ureters or neurovascular structures.
- Disseminated intravascular coagulation, acute transfusion reaction, adult respiratory syndrome, electrolyte imbalance and acute renal failure
- Maternal mortality as high as 7-8%, inspite of planned approach to delivery, availability of blood and blood products and best surgical care.[3]
- It is the most common indication for caesarean hystrectomy - 38%.[4]

Diagnostic Criteria

Definitive diagnosis of placenta accreta is made on visualization of chorionic villi embedded in myometrium with absence of the decidual layer between them in pathological specimen obtained after hysterectomy as shown in Figure 1.

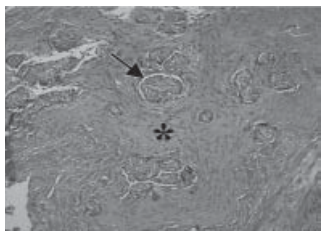

Figure 1: showing chorionic villi (arrow) completely surrounded by reactive myometrium (*), findings that are consistent with Placenta Accreta

Antenatal diagnosis of placenta previa plays an important role in reducing the maternal morbidity and mortality. It is based on identifying risk factors and use of imaging techniques (Sonography and MRI). This allows proper counseling of the patient and a multidisciplinary approach to manage the condition to reduce maternal and neonatal morbidity and mortality.

Risk factors

The most important risk factor associated with development of placenta accreta is the presence of placenta previa in patients with myometrial damage following cesarean section. An anteriorly placed low lying placenta carries the maximum risk as it develops over the scarred uterine wall. The following pneumonic is a reminder of the associated risk.

ACCRETA - A- All, C- Cesarean, C- Carry, R- Risk, E- Educate, T- Talk, A- Advocate

A linear increase in incidence of morbidly adherent placenta is observed with increasing number of previous cesarean sections with placenta previa. Silver et al in a prospective observational cohort of 30,132 women, who had cesarean delivery in 19 centers over 4 years concluded a exponential rise in the risk from approximatly 3% with one previous cesarean to nearly 65% with previous five.[5] Presence of placenta previa in patients without previous uterine surgery also is an independent risk factor with a risk of placenta accreta in 1-5%.[6]

Other risk factors associated include myometrial damage following myomectomy, overzealous endometrial curretage, thermal ablation, and presence of submucous myoma.[6,7,8] Advanced maternal age, multiparity, high gravidity, smoking and in vitro fertilization techniques are also associated with increased chances of morbidly adherent placenta.

Imaging Tecniques

Both Ultrasonography (USG) and Magnetic Resonance Imaging (MRI) are the modalities for prenatal diagnosis of placenta accreta, although limitations exist for each technique. As USG is relatively inexpensive and easily available, it remains the primary diagnostic tool for the diagnosis of abnormal placentation.

Ultrasonography :

Normally, on ultrasonography placenta appears relatively homogenous in echotexture with a clear hypoechoic retroplacental space (Figure 2). Transvaginal scans are found to be more sensitive in confirming placental location and diagnosing placenta praevia at 20 weeks of gestation than transabdominal scan.

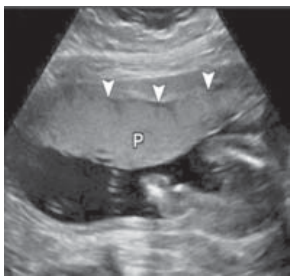

Figure 2: USG image showing normal placenta
(white arrow heads showing hypoechoic retroplacental space)

Grey scale sonography has been the cornerstone in diagnosing placenta accreta due to its wide availability and high accuracy. With a sensitivity of 96-98% and a specificity of 77-87 %, a positive predictive value of 65 -93%, and a negative predictive value of 98%, it is an excellent tool for the prenatal diagnosis of placenta accreta.[9] The evaluation of placental vessel architecture with 3- Dimensional power doppler imaging may complement in the antenatal diagnosis or exclusion of placenta accreta. It also helps in differentiating placenta accreta from placenta percreta by assessing the depth of invasion.

Ultrasound Criteria for diagnosis of Placenta Accreta[9]:

Grey scale:

First Trimester-

The presence of an anteriorly placed, low lying gestational sac on a transvaginal scan between 6 and 8 weeks of gestation in a patient with previous cesarean delivery has been considered a risk factor for development of placenta accreta. The basis of the hypothesis are studies where a retrospective analysis of all first trimester sonograms was made in patients diagnosed to have placenta accreta.[10] After ruling out possibilities of miscarriage, and scar pregnancy, these patients should be further screened for placenta accreta.

Second Trimester

- Loss of the retroplacental sonolucent zone (RPZ zone)/ or clear space (Fig 3) –

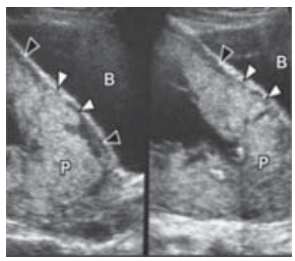

Figure 3: USG images showing disruption normal hypoechoic retroplacental space (black arrowheads) by placental tissue invading myometrium (arrow) B- bladder, P- placenta

  In normal placentation, a hypoechoic space is seen between the placenta and the myometrium. However absence of this space cannot always be correlated to presence of morbidly adherent placenta, but the presence of clear space excludes it. This finding was first noted by Finberg and Williams and latter confirmed by other authors. This suggests that this finding has a high sensitivity but low specificity. Camstock et al and Wong et al found this finding to have a senstivity of 100% and 73% respectively.[10, 11,12]

  This marker should not be used alone, as it is angle dependent and less specific.

- Thinning or disruption of the hyperechoic serosa–bladder interface –

  The normal uterine serosa–bladder interface is a continuous white thin line that is smooth with no irregularities or vascularity. Loss of this line is a very subtle finding which is best seen with transvaginal sonography with a patially filled bladder.[11,14] Increase in vascularity in this space as observed with color doppler is responsible for this finding. This marker has the highest positive predictive value.

- Presence of focal exophytic masses invading the urinary bladder (Figure 4)

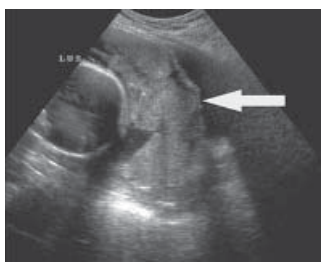

Figure 4: Sagittal view of transvaginal USG image the placenta is seen extending to the serosal surface of the bladder without any intervening myometrium (white arrowheads).

- Abnormal placental lacunae **(Swiss – Cheese or Moth eaten appearance)**

Lacunae are located deep in the substance of the placenta and are distinguished by their irregular shape as compared to round shape of placental lakes. Many authors have graded them according to the number of lacunae present in the placental tissue, and have found positive correlation of increased grading with presence of morbidly adherent placenta and the need for hystrectomy (Table 1). This marker has a high senstivity and negative predictive value.

Table 1: Placental Lacunae for diagnosis of Placenta accreta

Study	Sensitivity (%)	**Specificity (%)**	**PPV**	**NPV**
Cali et al (14)	73	86	60	90
Comstock et al(12)	93		93	
Wong et al](13)	100	28	21	100
Yang et al Gr. ≥ 1 (1-3 lacunae) (15)	86.9	78.6	76.9	88

Colour Doppler (2-D):

Findings suggestive of placenta accreta are

- Diffuse or focal lacunar flow vascular lakes with turbulent flow (Peak systolic velocity over 15 cm/s) (Fig 5)
- Hypervascularity of serosa–bladder interface.
- Markedly dilated vessels over peripheral subplacental zone.

Doppler ultrasound allows for diagnosis of bladder invasion in placenta percreta, seen as positive vascularization of the bladder wall on color Doppler

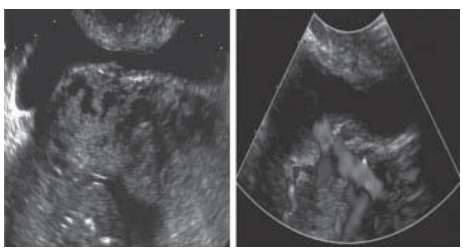

Figure 5: Placental lacunae.

(a) Transverse transvaginal USG image shows multiple tortuous hypoechoic structures within the placenta.

(b) Transverse transabdominal Doppler USG image helps confirm that the hypoechoic

Spaces are vascular and therefore represent placental lacunae

Three-dimensional Power Doppler:

3-D power doppler has been shown to be superior in diagnosing placenta percreta from accreta.[14] Findings on 3-D power doppler are:

- Numerous coherent vessels involving the whole uterine serosa–bladder junction (basal view)
- Hypervascularity (lateral view)
- Inseparable cotyledonal and inter villous circulations, chaotic branching, detour vessels (lateral view).

Screening Recommendations for antenatal diagnosis on sonography-

- First Trimester detection of a low implantated gestational sac in a patient with previous caesarean needs further evaluation
- Low lying placenta in patients at 20 weeks with or without previous myometrial damage may be reevaluated with repeat ultrasound for placental localization at 32 weeks.

Imaging at 32 weeks therefore seems timely in enabling a fairly definitive diagnosis to be made alongside a plan for further care, including follow-up imaging for possible accreta, counseling and planning delivery[16]

2. Magnetic Resonance Imaging:

Although in most situations MRI is no more sensitive in diagnosing placenta accreta than ultrasonography, it may be superior for the posterior placenta accreta or for more invasive increta and percreta. For women at high risk for placenta accreta, or with inconclusive ultrasonographic features, a 2- step protocol that uses ultrasonography first and then MRI may optimize diagnostic accuracy.

When to recommend MRI for diagnosis of Placenta Accreta[17]

- equivocal USG findings of abnormal placentation
- evaluation of posterior placenta in patients with risk factors
- obese patients
- complementary role in specifically delineating the extent of an USG-diagnosed placenta percreta.

There is no statistically significant difference reported between accuracy of USG (including color Doppler) and MRI for diagnosis of placenta accreta. In high-risk patients, a normal ultrasound at 18-20 weeks of gestational age does not completely exclude placenta accreta and these patients should be reevaluated in the third trimester. MRI is typically not indicated after a negative screening ultrasound due to relatively high negative predictive value of USG[18,19]

The optimal timing of MRI is not established and usually follows an incomplete or inconclusive USG. Patients undergoing MRI in second trimester can tolerate supine positioning, while a left lateral decubitus positioning is preferred for patients in third

trimester. This decreases the risk of impaired venous return from caval compression by the gravid uterus. A phased-array surface coil is used whenever possible to maximize signal.

3-Tesla MRI has attained interest recently because of its increased signal to noise ratio, faster sequences, and higher spatial resolution, in comparison with 1.5-Tesla scanners. 3-Tesla MRI of placenta is acceptable and no proven reproducible harmful effects have been reported so far. Normal intra -placental septi are well delineated on 3-Tesla MRI. It is claimed that 3-Tesla MRI can stage the grade of abnormal placentation more accurately.[20]

Imaging features of normal placentation on MRI (Figure 7a, b and c):

- Homogeneous T2-intermediate signal intensity of placenta
- Subtle, thin, regularly spaced placental septi
- Normal subplacental vascularity
- Triple-layered sandwich appearance of myometrium
- Pear-shape of normal gravid uterus with smooth contour

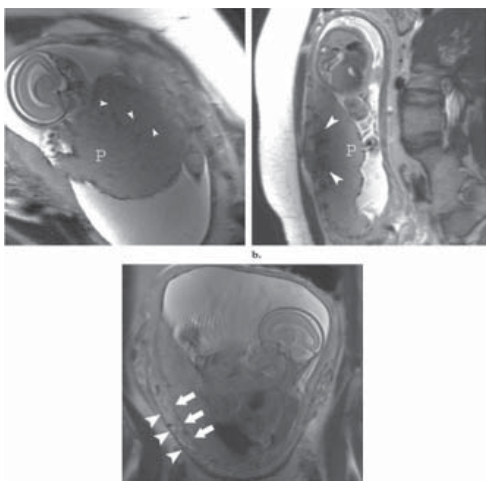

Figure 7: (a) Coronal oblique (b) Sagital (c) Coronal T2-weighted MRI images showing homogenous placenta (p) with thin linear areas of decreased intensity in a regular pattern (arrowheads) representing normal placental septi.

Various MRI imaging features of Placenta accreta with differing sensitivities and specificities are described in literature. Earlier MRI criteria for diagnosing placenta accreta which focused on primary signs of direct invasion of placenta into myometrium is now considered as nonspecific. The most acceptable cardinal imaging findings for diagnosis of placenta accreta are[18]:

- Dark intra -placental bands on T2-weighted images - appear as nodular or linear areas of low signal intensity on T2-weighted images and typically extend within the placenta from the placental–myometrial interface. These bands are thicker than the normally fine placental septa and show a random distribution. They represent areas of fibrin deposition within the placenta.
- Heterogencity within the placenta - Heterogeneous signal intensity in the placenta depends primarily on the presence or absence of abnormal T2 dark bands. It may also represent areas of hemorrhage in the placenta or increased vascularity. Homogeneous placenta can exclude abnormal placentation.
- Abnormal disorganized placental vascularity – Abnormal disorganized placental vascularity is described as hypertrophied, tortuous disorganized vessels deep within the placenta.
- Uterine bulging - focal outward contour bulge or disruption of the normal pear shape of the uterus, with the lower uterine segment being wider than the fundus, can be seen in Placenta accreta.
- Focal interruptions of the myometrial wall or extension through the myometrium with occasional invasion of adjacent structures can also be seen (high specificity for increta and percreta)
- Placenta directly invading or tenting the urinary bladder is highly specific for placenta percreta. MRI is useful in showing parametrial extension which is not apparent on USG.

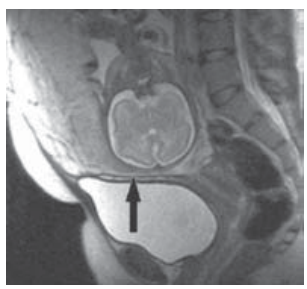

Figure 8: False positive finding of placenta accreta: MRI image showing a thin strip of tissue (arrow) that is slightly hyperintense relative to placenta.

The role of MRI in diagnosing placenta accreta is still debated. Two recent comparative studies have shown sonography and MRI to be comparable.[22,23] It has been found to have a definite role in assessing the depth of infiltration in diagnosed cases of placenta accrete.[23]

Role of Biochemical markers

Elevated levels of maternal serum alpha -fetoprotein and maternal serum free beta- human chorionic gonadotropin in the second trimester have been associated with placenta accreta but further research in this field is awaited before they can be used for screening.[24,25]

Conclusion

Placenta accreta is an obstetric complication that is

potentially ominous for the mother. It is currently developing the characterstics of an epidemic with increasing rates of cesarean section for delivery. This condition is one of the main causes of peripartum hysterectomy and maternal and perinatal morbidity and mortality. The diagnostic efficacy, low cost, and reproducibility makes ultrasound (both greyscale and color Doppler) ideal for the patients with suspected placenta accreta. MRI as a radiological tool has the advantage of excellent soft tissue contrast and non ionizing radiation. It use as a diagnostic tool is only in equivocal results on sonography or when the placenta has a posterior location. It has limitations such as high cost, claustrophobia and limited availability.

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Planning Delivery in Placenta Accreta: What guidelines have to say?

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Placenta accreta is a clinical condition wherein part of the placenta, or entire placenta, invades and cannot be separated from the uterine wall[1]. It is this placenta accreta, which can lead to problems during delivery when the placenta becomes inseparable partly or completely from the uterus. This leads to massive life-threatening hemorrhage warranting the need for hysterectomy and during the course of surgery there can be inadvertent injury to bladder, bowel or ureter. Due to massive transfusions the patient can have acute transfusion reaction, electrolyte imbalance, renal failure and disseminated intravascular coagulopathy (DIC). Blood loss during delivery in a woman with this critical condition is anything between 3 to 5 liters and patients require blood transfusion as a life saving measure[2]. Inspite of a planned delivery, blood and blood products at hand and an efficient team at the helm of surgical care mortality remains as high as 7%[3].

Management

It is critically important for both Obstetricians and patient to be familiar with the risks involved with placenta accreta because of its association with massive obstetric hemorrhage. A senior Obstetrician must examine any woman with placenta accreta in the antenatal period. This life-threatening obstetric condition requires multidisciplinary approach to minimize maternal and neonatal morbidity. Delivery must be planned in a hospital well equipped with a blood bank, anesthetist, senior obstetrician, intensivist, interventional radiologist, pelvic surgeon, urologist, gynecologic oncologist and a neonatologist. Teamwork is an essential part of care as it optimizes patient outcome. For patient safety an experienced Obstetrician must perform the delivery and in case of inadequate availability of support staff and blood bank it is imperative to deliver these patients in specialized tertiary care hospitals[4]. Maternal hemoglobin levels must be paid due attention to because of the risk of massive blood loss at the time of surgery. Autologous blood is valuable and a safe option. At times preterm delivery may become an emergency due to sudden onset hemorrhage. Antenatal corticosteroids should be administered for fetal pulmonary maturity in order to optimize neonatal outcome.

The timing of delivery needs to be individualized in a case of placenta accreta. It is important to counsel the patient and the relatives regarding delivery, indications for blood transfusion and the need for hysterectomy as a life saving measure in case of profuse hemorrhage to prevent a maternal morbidity/mortality. A planned delivery should be the goal of every obstetrician however; a back up emergency plan must always be in place. With a planned delivery complications can be handled better as compared to an emergency procedure.

Surgical Approach

In patients with placenta accreta the recommended management is a planned delivery at 36-37 weeks, with steroid cover and a need for caesarean hysterectomy in case of torrential hemorrhage without wasting valuable time. The placenta can be left in situ in women who desire future child bearing however, this may not be a feasible option if there is significant hemorrhagic morbidity. Management needs to be individualized and depends on clinical judgement. Delivery should be performed in a well-equipped operating room with support staff to manage the potential complications that may arise. Blood bank must be alerted in view of potential massive hemorrhage and need for packed red blood cells and fresh frozen plasma. Blood loss should be minimized during surgery. A pre-anesthetic assessment should be done for a patient with placenta accreta. General or regional anesthesia is safe and decision is always on individual basis. There is insufficient evidence that one is better than the other. Requisition for adequate blood and blood products are a priority before surgery is planned. Prophylactic antibiotics are indicated during prolonged surgery (2-3 hours) or when blood loss exceeds 1.5 liters. To prevent deep vein thrombosis, pre-operatively thromboembolic deterrent stockings should be placed till the patient starts ambulating. Prophylactic anticoagulants can be hazardous in women who are at high risk for bleeding and the decision is taken on an individual basis. To prevent any ureteric injury it may

be wise to place ureteral stents.

Prior to surgery it is advisable to perform an ultrasound mapping of the site of attachment of placenta and planning the incision. The incision should be made distant to the site of placenta without disturbing the placenta. A midline vertical incision may be preferred for better exposure should the need arise for hysterectomy. A classical incision, transfundal may be considered to deliver safely the baby while avoiding the placenta. Manual removal of placenta should be avoided when it is accreta as this can lead to massive hemorrhage intraoperatively and hysterectomy in 100% cases. The placenta can be left in situ and uterus closed or in case hysterectomy becomes mandatory then the standard approach is to leave the placenta accreta in situ, close the incision with a "whip stitch" and proceed with the hysterectomy. This is associated with less blood loss. Bladder flap is dissected late after securing the uterine arteries. Sub-total hysterectomy is a safer option but bleeding from the cervical stump may warrant a total hysterectomy.

Alternatively the umbilical cord can be ligated close to the fetal surface, removing the remaining cord and leaving the placenta in situ in women who desire future fertility or are willing for follow up with this conservative approach. Their coagulation profile should be normal and they must be willing to accept the risks involved with it including hysterectomy if this conservative management fails and uncontrolled excessive bleeding occurs. Other conservative methods that can be adopted in stable cases are folate antagonist methotrexate for post partum management of placenta accreta intrauterine balloon tamponade and selective pelvic embolization.[5,6] The risk of infection must be explained and prophylactic antibiotics may be helpful. There is a place of prophylactic catheter placement for balloon occlusion in anticipation for embolization. Uterine artery embolization can be life saving as well as uterus sparing in cases of uncontrolled hemorrhage.

The goals reflective of good obstetric outcome are:

1. Consultant Obstetrician planning and supervising the delivery
2. Consultant Anesthetist planning and supervising the delivery
3. Adequate blood and blood products available at the time of surgery
4. Multidisciplinary approach
5. Counseling and consent for hysterectomy, leaving the placenta in situ, need for Uterine artery embolization
6. Availability of ICU if the need arises

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Calendar of Monthly Clinical Meetings 2016-17

Months	Name of the Institute
February, 2017	ESI Hospital
March, 2017	UCMS & GTB Hospital
April, 2017	Apollo Hospital

Case Summaries for AOGD Bulletin may be sent by email to the editor/CD may be handed over on the day of the meeting.

-Dr Sangeeta Gupta

Unexpected Retained Placenta: What next?

Sarita Shah[1], Reva Tripathi[2]
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"Since it is a verity indubitable, that the after-birth remaining behind after the child is born becomes a useless mass, capable of destroying the woman, we must take care that it be never left, if possible."[1]

Francois Mauriceau

Retained placenta is defined as a placenta that is not expelled within 30 minutes of the baby's birth where the third stage of labor has been managed actively. This time limit may be extended to 60 minutes in a physiological third stage. In general, 97% of placentas[2] deliver within 30 minutes. A retained placenta is not necessarily accompanied by haemorrhage but a hemorrhage can occur at any point which may be concealed, therefore it is essential to treat it as a potential emergency and monitor the woman closely, preferably using standardized scoring systems, like Modified Early Obstetric Warning Score (MEOWS), to identify early deterioration.[3]

As time passes without placental separation and delivery after the newborn has delivered, the risk of hemorrhage and hence maternal morbidity and mortality increases. *This assumes great significance as it is usually an unexpected event and may occur in a low risk woman who has delivered in a facility having only minimal resources.*

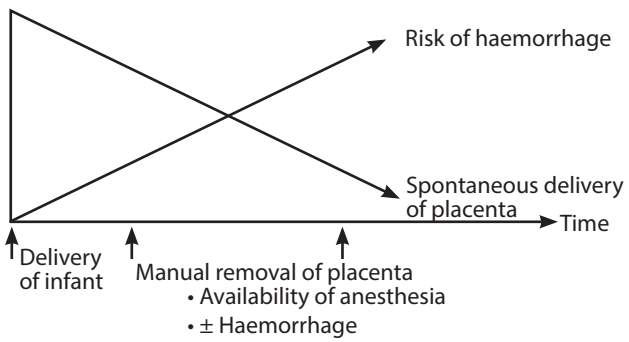


Figure: Factors in decision and timing of manual removal of retained placenta[4]

Types of retained placenta

- The placenta that has separated from uterine wall but is retained due to either atony or, a constriction ring at the junction of lower and upper uterine segment or in one cornua.
- Failure of the normal separation through the decidua spongiosa layer leading to ordinary adherence of placenta. These cases usually do not bleed excessively.
- Pathological adherence of placenta/ morbidly adherent placenta- women with placenta previa particularly those with previous caesarean sections are more prone to placenta accreta. The risk increases further with repeated caesarean sections.[5]

Cases of retained placenta are usually unexpected; however women with certain predisposing conditions should be managed more cautiously, like those with history of retained placenta in previous pregnancy (recurrence risk is 25%)[4], uterine scar (previous caesarean section, myomectomy, curettage, and hysteroscopic surgery), uterine fibroids and anomalies, preterm labour and use of long acting utero-tonics like ergometrine and syntometrine.

Management

Most cases of retained placenta require manual removal. However timing of this procedure depends on availability of safe anesthesia and also on the presence or absence of hemorrhage.

- Continue uterine massage to expel the clots. Ensure that the bladder is empty. Stimulate uterine contraction. If no oxytocic has been administered, give 10 units of oxytocin IM. Do not give ergometrine as it causes tonic uterine contraction which may delay placental expulsion. Put tablet Misoprostol 800 mcg per rectally. Controlled cord traction should be given with uterine contractions.
- DO NOT leave the woman unattended whilst the placenta remains in-situ.
- In a peripheral setting, arrange immediate transfer to a higher center with facility for blood transfusion and emergency operation theatre. Keep a clear record of the total estimated blood loss during transfer.
- Ensure IV access and take blood sample for full blood count and grouping and cross matching and commence intravenous fluids.
- Undertake maternal observations every 10 minutes or more frequently as the observations dictate using MEOWS.
- Administer an intra-umbilical vein injection of 20ml saline + 20IU oxytocin close to the vulva.

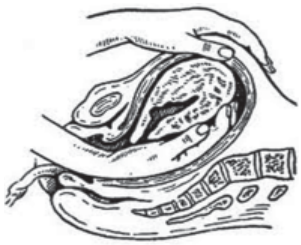
- If, in spite of controlled cord traction, administration of utero-tonics and intra-umbilical vein injection of oxytocin + saline, the placenta is not delivered, manual removal of the placenta should be offered as the definitive treatment. This is necessary because the incidence of postpartum haemorrhage and other complications begins to rise progressively once the third stage exceeds 30 minutes. If there is no bleeding and vitals are stable one can wait for 30 minutes more.

Unnecessary delay increases risk of postpartum haemorrhage

Manual removal of placenta

This should be carried out in operation theatre with adequate anesthesia. Consent for manual removal should be taken. Obstetrician should perform a vaginal examination just prior to anesthesia, as in a number of cases placenta will deliver spontaneously. Adequate anesthesia with uterine relaxation has to be ensured.

With the patient in dorsal lithotomy position, one hand is placed on the abdomen to apply counter pressure to steady the fundus and the other hand is guided by the umbilical cord inside the uterine cavity.



Fingers are insinuated between the placenta and the uterine wall with the back of the hand in contact with the uterine wall. Placenta is separated with sideways slicing movements of the fingers as a single unit until the placenta is completely separated when it is grasped and removed slowly.

Uterine cavity is re-explored for any placental fragments and integrity of uterine wall. Cervix and vagina should be examined and any lacerations should be sutured. 5 units of oxytocin intravenously as bolus dose followed by 40 units in 1L of saline over 4 hours is given to ensure that the uterus is contracted. Prophylactic broad spectrum antibiotic should be given.

Adequate replacement of ongoing blood loss with intravenous fluids and blood products is of utmost importance

If there is excessive bleeding or signs of maternal shock at any time when the placenta is retained, arrange immediate transfer to theatre. Do not wait for any of the previous steps.

Do not attempt to remove a retained placenta in delivery room or without anesthetic

Retained Adherent Placenta

A retained placenta in a patient with a previous caesarean section must be treated with great care as the likelihood of a placenta accreta is increased. Often the diagnosis of adherent placenta is made when plane of cleavage between placenta and uterine wall is not identified during attempted manual removal.

In focal placenta accreta, placental tissue is removed as much as possible and hemostasis is achieved by ensuring uterine contraction with oxytocics and if required, uterine tamponade with either special intra-uterine tamponade devices, or condom catheter or packing with sterile gauze. In cases of caesarean section hemostatic sutures are taken over the bleeding areas. An early decision of hysterectomy should be taken in cases of excessive bleeding if the uterus fails to contract.

In total placenta accreta, hysterectomy is indicated in multiparous patients. In women desirous of future fertility, a conservative approach may be taken provided there is not much bleeding and the woman's vitals are stable. Uterine artery embolization and methotrexate can be used in such cases, but there is no consensus.

At any point hysterectomy should take precedence over conservative management when there is life-threatening hemorrhage

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Forthcoming Events

1. CME by DGF north under aegis of AOGD Reproductive Endocrinology subcommittee on 7th February, 2017 at Apollo Spectra, Karol Bagh.
2. CME on 'Infertility and Assisted Reproduction' by Department of Obstetrics and Gynaecology & IVF and ART Centre, Maulana Azad Medical College, Delhi on 5th February, 2017. Interesting topics and recent advances would be discussed. Details at http://www.mamc.ac.in/
3. IUI workshop with hands-on semen preparation, Conference & Breakfast meeting with experts in Conference 'Low cost IVF - Can we make it a reality?' under the aegis of Indian Fertility Society and Infertility subcommittee AOGD on 11th & 12th February 2017 at Hotel Ibis International, Aerocity near IGI Airport. Contact Dr Renu Mishra 9811147217
4. International Gynae Cancer Conference on 18th and 19th February 2017, in India Habitat Center. It is a two day program with workshop on first day and Conference on the second. Details at http://www.dhrc.in/icc2017/
5. Second Maternal-Fetal Medicine Workshop is being organized by High Risk Pregnancy & Perinatology Programme, Deptt. of Obstetrics & Gynaecology, Maulana Azad Medical College, New Delhi, on 18th February, 2017. Details at http://www.mamc.ac.in/
6. Fetal Medicine and Genetics Subcommittee in association with the Society of Fetal Medicine (SFM) is organizing a CME on 26th February, 2017 at Apollo Hospital, Delhi
7. Update on - PCPNDT Act : Medico-legal Implications for Practitioners , on 18th March 2017
8. CME on Endoscopic Video Session in association with DGES to develop learning skills on 19th March, 2017

AOGDians at 60th AICOG, Ahmedabad

- **Dr Kuldeep Jain** has taken over as Chairman of Endometriosis Committee of FOGSI
- **Dr Monika Gupta** received ICOG Travel Fellowship in ART & FOGSI Yuva Orator Award.
- **Dr Sudha Prasad** delivered a talk on 'Rescue Circlage'
- **Dr Ashok Kumar** moderated a panel discussion on 'Anemia during Pregnancy- Known Enemy'
- **Dr Neerja Bhatla** conducted 'Gynae Oncology' Sessions
- **Dr Pratima Mittal** delivered a Guest Lecture.
- **Dr Sunita Malik, Dr Achla Batra and Dr Jyotsna Suri** were the faculty at 'Critical Care' Workshop.
- **Dr Nidhi Garg & Dr Aakriti Gautam** won third prize in FOGSI National Quiz Competition.

FOGSI - President's Rotating Trophy-2015, *Winner:* "A" Category - Delhi Society

Dr Sunita Malik, Dr Achla Batra and Dr Jyotsna Suri - Faculty at 'Critical Care' Workshop

Dr Monika Gupta received ICOG Travel Fellowship in ART & FOGSI Yuva Orator Award

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Dr Sudha Prasad delivered a talk on 'Rescue Circlage'

Dr Ashok Kumar moderated a panel discussion on 'Anemia during Pregnancy- Known Enemy'

Association of Obstetricians & Gynecologists of Delhi (AOGD)

Congratulates

Dr Kamal Buckshee

for

FOGSI "Life Time Achievement Award" at AICOG, Ahmedabad

FOGSI - Awards & Prizes 2016 at AICOG Ahemdabad

Congratulation All AOGDians

FOGSI - President's Rotating Trophy 2015

(April 1, 2015 to March 31, 2016)

Winner : **"A" Category - Delhi Society**

FOGSI Corion Awards 2016

Senior Category:

Winner: Dr Nutan Agarwal, New Delhi

1st Runner up: Dr J B Sharma, New Delhi

Junior Categroy:

Winner: Dr Kavita Agarwal, New Delhi

FOGSI-Travelling Fellowship 2016

Dr Archana Kumari, New Delhi

FOGSI-Dr R D Pandit Research Prize 2016

Dr Anukriti Kumari, New Delhi

FOGSI-Dr Kamini A Rao orator for the year 2017

North Zone: Dr K Aparna Sharma, Delhi Society

FOGSI, IPAS, Young Talent Promotion Committee and MTP Committee Award 2016

Dr Richa Sharma, New Delhi

12th National Conference of Indian Society of Colposcopy & Cervical Pathology

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6. Fertility sparing management of early cervical cancer
7. Videos of Radical Trachaelectomy and Ovarian Transposition
8. Management of Vulval and Vaginal lesions

Confirmed International Faculty


Dr Adeola Olaitan (UK)


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Send Registration Form & details as mentioned above by post / courier to:
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Surgical Management of Placenta Accreta

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Introduction

Placenta accreta is an emerging cause of maternal morbidity and mortality. It is characterized by an abnormal adhesion of placental villi to the myometrium due to partial or total absence of the decidua basalis and imperfect development of the Nitabuch layer.[1] The incidence of placenta accreta has dramatically increased in recent years from 1 in 2500 in 1980s to 1 in 533 in 2002 and is mostly due to increasing rate of cesarean delivery.[2] Besides increasing maternal morbidity and mortality, abnormal invasive placentation is also a leading cause of intractable postpartum hemorrhage and emergency peripartum hysterectomy. Thus, understanding the basic surgical principles of management of placenta accreta is of utmost importance in modern obstetrics.

Diagnosis

Management of adherent placenta is of great challenge in obstetrical practice. Attempt to remove placenta may result in catastrophic haemorrhage requiring multiple transfusions, disseminated intravascular coagulation and sometimes may result in maternal death. Successful management of this condition requires early diagnosis and referral to a tertiary care centre where a multidisciplinary team including experienced obstetrician, anaesthetist, haematologist along with adequate blood products are available. This reduces morbidity and mortality associated with morbidly adherent placenta (MAP). Sometimes the diagnosis is made following delivery when the placenta fails to separate after delivery of baby. If diagnosed at the time of delivery it is likely to result in more complications, therefore it is very important to anticipate and diagnose MAP in antenatal period.

Antenatal imaging techniques like ultrasonography and magnetic resonance imaging can be used in suspected cases of placenta accreta for diagnosing the condition antenatally but the definitive diagnosis can only be made at time of surgery. The value of making antenatal diagnosis is it allows multidisciplinary planning in an attempt to minimize potential maternal and neonatal morbidity and mortality.[3]

Management

Preoperative planning is crucial to obtain an optimal outcome in the management of a patient with suspected placenta accreta. The advantages of an early diagnosis in the antepartum period is to plan place of delivery and the timing of delivery all resulting in improved maternal and fetal outcomes.[7]

Place of delivery: Delivery should be done in a higher center with a multidisciplinary team and adequate equipment and resources including a maternity-oriented intensive care unit (ICU), an embolization unit with interventional radiologists, a blood bank capable of managing massive transfusion requirements, and the availability of other technical skills (urologists, vascular surgeons). The multidisciplinary team includes anesthesiologist, obstetrician, gynecologic oncologist, neonatologist, physician. It makes intuitive sense that expertise and experience are useful when managing difficult and somewhat uncommon problems. This has been demonstrated by Eller et al. who found that maternal morbidity is reduced by 80% in women with placenta accreta who delivered in a tertiary care hospital with a multidisciplinary care team in comparison with those managed in standard obstetric care facilities[4]. A worse outcome and a higher morbidity has been reported in women where placenta accreta was diagnosed after delivery or at the time of cesarean section resulting in management in an unplanned fashion.[5,6]

Timing of delivery

The decision regarding timing of delivery should be made jointly by patient, obstetrician and pediatrician and should be at least after 34 weeks of gestation, that is,after fetal lung maturity.[3] However elective delivery by cesarean section should be planned at 36-37 weeks of gestation in suspected placenta accreta.[7] Studies have reported that in patients with a pre-delivery diagnosis of placenta accreta who underwent a planned cesarean hysterectomy with no attempted removal of the placenta at 34-35 weeks gestation, required fewer units of packed red blood cells and

tended to have a lower estimated blood loss than those with no pre-delivery diagnosis.[8]

Requirement of blood transfusion

The bleeding at the time of peripartum hysterectomy for placenta accreta is often substantial. The average blood loss at delivery in cases with placenta accreta is 3,000 ml[8]. O'Brien et al. reported that blood transfusion was necessary in 90% of patients with placenta accreta, and 40% of them required more than 10 units of packed red blood cells. Because of a potential risk of massive hemorrhage, adequate blood products should be available and the use of cell salvage should be considered where available.[8,9]

Surgical Management

There are various options in the management of placenta accreta..

Delivery of fetus with a forcible manual removal of the placenta delivery in an attempt to obtain an empty uterus is associated with a higher rate of massive PPH and subsequent peripartum hysterectomy. Unfortunately, this situation of an unforeseen intraoperative complication is encountered in most cases with undiagnosed placenta accreta during cesarean section when preoperative placenata accreta is not suspected thus necessitating the importance of preoperative diagnosis.[10,11,12] This practice should be discouraged as attempts at placental separation risk severe life threatening hemorrhage.

Cesarean section hysterectomy consists of performing a hysterectomy after delivery of the fetus without attempting removal of the placenta in cases with placenta accreta suspected antenatally or following a failed attempt of placental removal in placenta accreta diagnosed during delivery. This option is currently recommended and is considered the gold standard treatment for placenta accreta.

However, this approach might not be considered first-line treatment for women who have a strong desire for future fertility[3,7] For patients desiring to retain fertility various conservative modalities have been proposed over the time.

A surgical approach of *leaving the placenta insitu after delivery of the fetus and closing the uterus and abdomen* have been tried with varied results. In some cases, placenta resorbs itself and in others hysterectomy is eventually required either due to bleeding or infection.[1] Evidence regarding methotrexate use is also lacking and thus it is also not usually advocated[7]. Serial measurements of beta- HCG after leaving placenta in situ are not much informative where as serial ultrasound and MRI are recommended for monitoring the resorption of placenta.[2]

The Triple-P procedure is a three step conservative treatmentinvolving obstetricians, anesthetists and interventional radiologist to prevent significant hemorrhage and peripartum hystrectomy. The three steps are:

1. Perioperative placental localization and delivery of the fetus by anincision above the upper border of the placenta
2. Pelvic devascularization by inflating radiologically pre-placed occlusion balloonsin both Internal iliac arteries
3. Placental non-separation with myometrial excision and reconstruction of the uterine wall.[13]

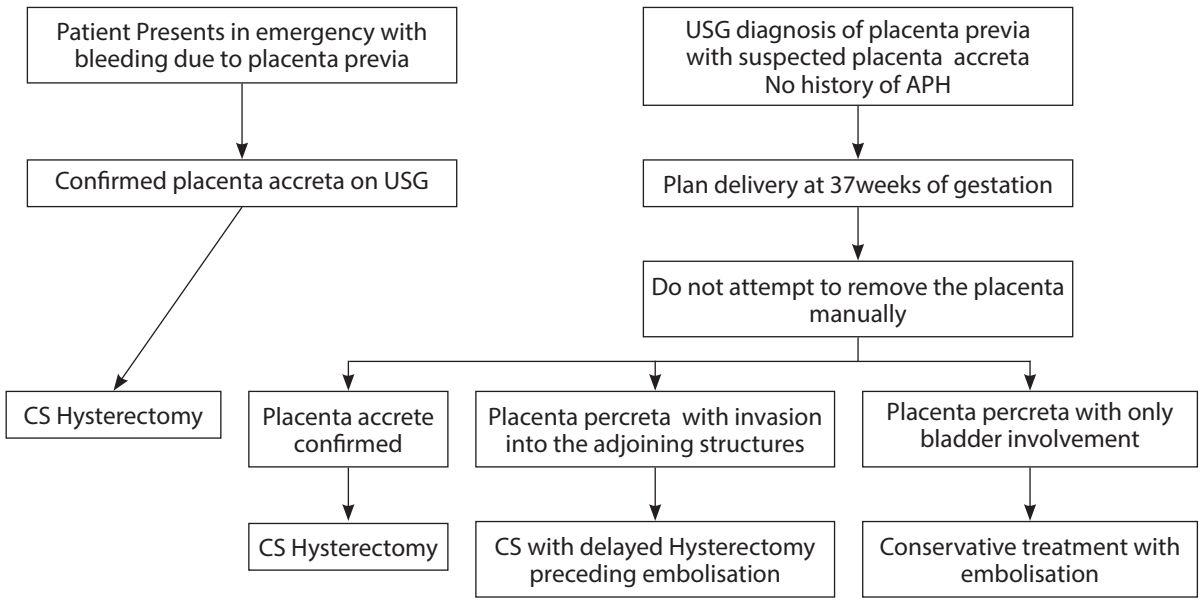
Whatever the option chosen, when placenta accreta is suspected before delivery in a woman with an anterior placenta previa, the only recommended management is planned cesarean hysterectomy with the placenta left *in situ* because removal of the placenta is associated with significant hemorrhagic morbidity. Thus, it seems reasonable to propose in the present state of knowledge, a cesarean-hysterectomy if the patient has no desire for a future pregnancy, is at a relatively advanced reproductive age and is multiparous. However the decision for hysterectomy should be planned beforehand taking into consideration the type of invasion of placenta whether accreta or percreta with involvement of adjoining structures, the hemodynamic condition of the patient and desire for fertility (algorithm)

Surgical technique

When placenta accreta is suspected preoperatively or in women at high risk, preoperative preparation should be planned to optimise outcomes

1. **Place of surgical intervention**. The management of placenta accrete should always be done in a tertiary care hospital.Women suspected of placenta accreta should be referred or transferred preoperatively to a tertiary centre for better management.
2. **A multidisciplinary team** of surgeons should be available which includes a senior obstetrician, pediatrician, anesthetist, vascular surgeons, trauma surgeons
3. **A scheduled, elective delivery** should be planned so that the operative procedure can be undertaken in a controlled fashion. This should be performed in the main operation theatre preferably in day time.

Algorithm showing management in Placenta Accreta



4. **Availability of blood and blood products**. Communication with blood bank personnel as well as the availability of massive transfusion protocols should be improvised to improve outcome. Ensure availability of required blood products, including red blood cells, fresh frozen plasma, and platelets.
5. **Informed consent and counseling** different treatment options should have been discussed and a plan agreed and this should be clearly written in the consent form. Description of skin and uterine incision, hysterectomy versus leaving placenta in situ or triple P procedure whichever is preferred should be made. The risks of massive blood loss, per- operative genitourinary tract injury, need for re-operation for causes like bleeding, post operative ICU admission and even maternal death should be properly explained to the patient and her relatives pre- operatively. If the women with placenta accreta desire future fertility, attempts for conservative management can be made but the women should be counselled regarding potential risks of these approaches and different events where conservative treatment has to abandoned. The women and her relatives should be counseled for risk of PPH, need for peripartum hysterectomy, Need for multiple medical /surgical intervention, ICU requirement and prolonged hospital stay. In women with percreta, injury to bladder, bowel, need for other ancillary procedures alongwith radiological interventionsshould be explained.
6. Pre operative mapping of placental location by ultrasound helps in determining abdominal and uterine incisions so as to avoid disturbing placenta before and after the delivery of the fetus

Surgical steps

Abdominal incision To facilitate speed, greater pelvic access and exposure, the abdominal incision should be infraumblical midline vertical.

- **Inspection** Once the abdomen is entered, the anterior surface of the uterus preferably the lower segment should be inspected followed by the lateral surface. The most common site of placental invasion is through the anterior uterine wall to the bladder. The presence of any vascular channels and any evidence of anterior placental invasion should be noted.

  These vascular channels should not be held or disturbed. Similarly, the placenta may invade laterally and encroach upon the parametrium. Lateral placental invasion may hinder identification of the ureters and make isolation of the uterine vasculature difficult
- **Uterine incision** After identification of placental abnormalities, the incision for cesarean section should be chosen. Ideally, an upper segment cesarean section is done in placenta accreta associated with anterior placenta previa to deliver the baby so as to avoid cutting through the placenta..
- **Delivery of baby** After the delivery of fetus, extent of placental invasion should be assessed without making attempts to remove the placenta manually.

At times placenta separates spontaneously and easily removed but only small area of focal accreta is present and this is best managed by removing the placenta with the adjoining uterus and re-sewing the defect. In cases of heavy bleeding, the placement of deep myometrial sutures in multiple 3-cm squares bracketing the involved area, also called as CHO sutures, may achieve hemostasis.

- **Decision for Hysterectomy** Finally, if the intraoperative findings are consistent with placenta accreta the decision should be made expeditiously to proceed with hysterectomy. The use of ancillary procedures, such as prophylactic ligation of the internal iliac artery, are of no benefit. However, bilateral ligation of the internal iliac artery should be done in cases where intractable bleeding occurs due to attempts at delivery of placenta or inadvertent cutting of placenta in an undiagnosed placenta accreta
- Once the decision is made to proceed with hysterectomy, the upper segment incision should be closed expeditiously and should proceed for hysterectomy.

Steps of cesarean hysterectomy

Principle: The basic principles of obstetric hysterectomy is similar to the hysterectomy in gynecological patients but there are number of anatomical and physiological changes in pregnant uterus and pelvis that can cause potential difficulties.[3] Uterus is enlarged and the adjacent pelvic structures are edematous and friable. Also, the uterine vessels along with collateral vessels are enlarged, engorged and torturous. Unlike the standard procedure of hysterectomy the clamps on the pedicles should be placed slightly away from the uterine wall so as to avoid disruption of uterine wall and subsequent haemorrhage. The major vascular pedicles being edematous and thick should be doubly clamped and should be ligated within the retroperitoneum.

Steps

- Divide the round ligament and open the retroperitoneum widely
- The Tubo-ovarian ligaments divided, and the ovaries packed.
- The uterovesical fold of peritoneum is then gently opened avoiding the vascular channels as far as possible and the bladder dissected away from the uterus to the extent possible without placental disruption.
- In patients with previous cesarean section, posterior wall of the bladder is often adherent to the lower uterine segment and precise sharp dissection is required to free this adherence. Blunt dissection with gauze is not recommended as this may cause more bleeding, tearing and perforation of friable adherent bladder wall.[14] If bladder involvement is suspected, then cystotomy and digital palpation may be needed to visualize extent of placental invasion. Efforts to dissect densely adherent bladder to uterus will not only increase bleeding but also damage detrusor muscle making it unsuitable for repair, increasing chances of fistula formation in future. Thus, excising the involved portion of bladder is the better course in most settings. Do not use sponges or mops to separate the bladder
- The uterine artery and its collateral channels are then ligated, again attempting to avoid disrupting the wall of the uterus if it is thinned and friable
- After the major vascular channels are divided continue the dissection until downwards till the lower edge of the placental attachment is reached. This typically requires additional dissection of the plane between the bladder and uterus/placenta. There are often multiple small vascular channels along the posterior wall of the bladder that must be cauterised or ligated to limit bleeding. It is often necessary to perform a cystotomy to fully separate the bladder from the uterus.
- Once below the placental tissue the lower uterine segment and cervix are gently elevated, clamps applied and the cervix with uterus with the placental mass is cut.
- After the uterus and placenta have been completely removed the entire pelvis should be re-inspected

Complications that can be encountered during peripartum hysterectomy

Massive blood loss is perhaps the most important complication of peripartum hysterectomy

Median blood loss for women with placenta accreta undergoing peripartum hysterectomy is approximately 3000 ml, whereas the median transfusion requirement is 5 units of PRBC.[9] Few reliable predictors for which women will require a massive transfusion

- Hysterectomy done in an unplanned manner
- Emergency hysterectomy in an undiagnosed placenta accreta
- Inadvertent attempt at removal of placenta
- Delivery of baby cutting through the placenta

Proper replacement of blood loss with prompt and adequate transfusions plays a crucial role in decreasing post operative morbidity by minimizing hypovolemia, acidosis and coagulopathy. Cell salvage technique of auto transfusion can be considered in women with risk of massive hemorrhage and in women who refuse donor blood[7]. The recombinant activated Factor VIIa (rFVIIa) have recently been used effectively in the treatment of uncontrollable obstetrical hemorrhage but should be used as a last resort due to potential complications of vascular thrombosis and thromboembolic events.[1]

Injuries to the genitourinary tract are most common, with reported rates of cystotomy of 6–29% and ureteric injuries in up to 7% of women especially in cases with placenta percreta

Various ancillairy procedures to reduce complications during the surgical management

For reducing intra operative bleeding complications

- Cesarean section is done in the upper segment either by vertical incision or transverse incision away from the upper edge of placental attachment thereby avoiding cutting through the placental tissue
- Once baby is delivered out, avoid fiddling with the placenta, no attempt should be made to separate the placenta manually.
- If there are no signs of placental separation and no bleeding, proceed to hysterectomy
- Any anticipation of risk of bleeding during hysterectomy one should do bilateral internal iliac artery ligation.
- Interventional radiology pelvic vessel embolisation and balloon occlusion catheters may also be of use in women undergoing peripartum hysterectomy for placenta accreta.
- Embolisation catheters can be placed preoperatively, to be used if bleeding ensues or in the case of patients with obstetric haemorrhage after delivery. Pelvic artery embolisation is also useful in women who have continued bleeding after hysterectomy
- Placement of balloon occlusion catheters: Placement within the internal iliac artery is most common. At the time of hysterectomy the balloons can be inflated prophylactically or if heavy bleeding is encountered. The utility of balloon occlusion catheters remains controversial. These adjunctive procedures have been proposed to decrease blood loss during cesarean hysterectomy. Use of radiologic interventional procedures like balloon catheter occlusion or embolization of internal iliac artery have been controversial as they have doubtful efficacy and associated with complications like insertion site hematoma, abscess, tissue infarction and necrosis.[14,15]
- Ligation of internal iliac arteries have reported to reduce pulse pressure and transform pelvic arterial system into venous system and thus establishing slow and sluggish blood flow, so that blood clots distal to ligation are not displaced and bleeding from other sites can be identified clearly.[16,17] But if surgeon is not experienced in this procedure, it adds to time and thus increase morbidity of the patient. Some studies have also reported ineffectiveness of the procedure in reducing intra-operative bleeding.[18] Therefore, decision regarding prophylactic internal iliac artery ligation should be individualized depending on surgeon's experience and degree of bleeding during surgery.
- In some cases, there might be persistent pelvic bleeding after hysterectomy which can be controlled by placement of pelvic pressure packing like laparotomy sponges or balloon tamponade devices for some time

For reducing intra operative injury to bladder / ureter. Urinary tract injuries are commonly associated with peripartum hysterectomy with reported rates of cystotomy and ureteral injuries as 6-29% and 7% respectively.[19] Therefore, in women with placenta accreta with previa, pre-operative stenting of ureters is preferred for better palpation intra-operatively and thus reducing ureteral trauma.

Novel Technique of Cesarean Hysterectomy

Recently, a new surgical technique of cesarean hysterectomy called as posterior retrograde abdominal hysterectomy has been described by AE Selman in 11 patients of placenta accreta in 2016.[20] In this technique, woman is placed in lithotomy position and cesarean is performed by fundal hysterotomy. Placenta is left in situ and uterine incision closed. Uterus is exteriorized and Bilateral round ligaments clamped and ligated. Then, broad ligaments are incised laterally to expose retro peritoneum and bilateral internal iliac arteries ligation done after dissecting ureters. Next, the utero-ovarian ligaments and tubes are divided and ligated bilaterally.The posterior vaginal fornix is exposed by placement of a sponge stick into the vagina, which is opened transversely, 1–2 cm below the cervico- vaginal junction and then, vagina is circumscribed, divided and secured. After that cervix is pulled up behind the uterus and the remaining ligaments are divided and secured. Lastly, vesicouterine space is developed

cephalad by blunt dissection. The author claimed that this technique allows easy identification of the vagina and early uterine de-vascularisation, as well as safe resection of the involved urinary bladder in women with placenta percreta showing bladder penetration. There were no maternal and fetal complications reported.

Postoperative management

- Due to massive blood transfusion and prolonged surgery, women with cesarean tend to have high post operative morbidity and mortality and thus require continuous monitoring of vitals (blood pressure, pulse rate, respiratory rate and saturation of oxygen) in intensive care unit or high care specialty wards.
- Urinary output should be monitored by an indwelling catheter.
- Due to hypoperfusion and subsequent organ ischemia, renal, cardiac or other organ dysfunction can occur.
- Sheehan syndrome, both permanent or transient, has been reported after massive postpartum hemorrhage.
- Patient should be carefully monitored for recurrent intra- abdominal or retroperitoneal bleeding and low threshold should be kept for re exploration.
- Early ambulation and compression devices can be used to prevent thromboembolic complications.

Conclusions

Due to increasing rate of cesarean delivery, placenta accreta has become a leading cause of emergency cesarean hysterectomy. Prenatal diagnosis is considered to be the most important factor in decreasing the associated maternal morbidity and mortality as it allows proper planning regarding timing of the delivery, arrangement of blood products and most importantly prepare a devoted and expert multidisciplinary team for the surgery. Till date, hysterectomy remains the mainstay treatment of the placenta accreta and conservative approaches are still controversial.

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Role of Embolization in Placenta Accreta: Is it good or bad

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Placenta accreta is a potentially life threatening obstetric condition that requires multidisciplinary approach to its management. The incidence of adherent placenta has increased and seems to parallel the increasing rate of caesarean section. Diagnosis of this condition before delivery allows appropriate planning and coordination in an attempt to minimize potential maternal and neonatal morbidity and mortality. Although with advancement in diagnostic modalities more and more cases are identified in the antenatal period, the diagnosis is occasionally discovered during delivery. In general the treatment of suspected placenta accreta is planned caesarean hystrectomy at 34-35 weeks.[1] The placenta is left insitu because attempts at removal of placenta are associated with significant haemorrhagic morbidity.[1,2,3]

In recent years, there has been significant interest in the potential role of interventional radiological techniques in obstetrics, specifically in the control of peripartum haemorrhage. As far as placenta accreta is concerned their role can be in conservative uterine sparing management or in controlling perioperative haemorrhage in peripartum hysterectomy.

Intra arterial balloon occlusion for control of bleeding was first described during the Korean war (Edwards 1953, Hughes 1954) and transcatheter embolisation techniques in treatment of obstertric emergencies have been reported since 1979 (Brown 1979). Inserting intravascular balloon catheter for occlusion and /or arterial embolization of the pelvic arteries was introduced as an invasive adjunct therapy in order to minimise blood loss during caesarean hysterectomy. It also has a role for placenta percreta with bladder invasion or for young women who want the option of future pregnancy and who agree to close follow-up monitoring where conservative treatment is a valid option.[2]

It may be used both for emergent control of pelvic haemorrhage and electively for prevention of massive blood loss during peripartum hysterectomy.

Transcatheter techniques in the context of abnormal placentation have included:

- Prophylactic internal iliac occlusion balloon catheter
- Prophylactic internal iliac arterial catheterisation, balloon occlusion and embolisation
- Emergency transcatheter arterial embolisation
- Occlusive balloon catheter in other sites (aortic or common illiac)

Procedure

The procedure should begin with ensuring hemodynamic stability, normal coagulation study and administration of broad spectrum antibiotics. A written informed consent is mandatory explaining the procedure and its complications.

Transcatheter embolisation is performed in an operating room equipped with angiographic equipments like fluoroscopy or c-arm device. The procedure is usually done under sedation and local anaesthesia although epidural anaesthesia may sometimes be given. The most commonly used route is via the femoral artery. After sterile preparation of the groin the femoral artery is accessed using single wall puncture technique. A 5 or 6 F sidearm sleeve is then inserted to obtain coaxial access to facilitate catheter exchange. The procedure begins with diagnostic aortography which is performed by positioning the catheter with multiple sideholes at L1 vertebral level to allow imaging of the origin of the ovarian artery as well as the pelvis. After basic anatomy is demonstrated selective arteriography is performed to pinpoint the location of the pathologic process and plan treatment. The next step is interrogation of the internal iliac arteries. The choice of catheter and guide wires depends on the operator and the procedure. Commonly a 4- or 5F selective angiographic catheter is used to achieve access to the internal iliac artery and a 2-or 3-F micro catheter is used for selective catheterization of small calibre vessels. When extravasation or another pathologic condition is identified, the catheter is appropriately positioned for treatment which is embolization. The procedure may need to be tailored according to the case at times.

The materials used for embolization are broadly classified into two categories, according to whether they provide temporary or permanent occlusion. Permanent occlusion is required for progressive diseases like malignancy whereas temporary materials are appropriate for self limiting processes that may heal with time. Permanent embolic materials include particulate agents (polyvinyl alcohol foam, microspheres), metallic coils and plugs and liquid polymers. Temporary agent most commonly used is

the gelatine sponge (gelfoam pledgets). It is water soluble that allows recanalisation within several (2-4) weeks after placement. The absorbable gelatin foam and polyvinyl alcohol foam are not radio opaque and therefore are injected as slurry with iodinated contrast material. The end point of embolization is visualization of marked pruning of the arterial tree or contrast stasis at imaging. Temporary agents are preferred as they are less likely to cause ischaemic complications.

The advantage is that it does not preclude any other haemorrhage control measure. If necessary, arterial ligation can be performed after embolization is attempted.

The procedure is associated with few complications (6-16%) which call for a vigilant post operative period. They are split into three categories: complications of angiography, infection and ischaemic complications.[4]

Acute complications include puncture site hematoma formation, thromboembolic events, infection, arterial dissection, pseudo aneurysm, lower extremity emboli, contrast allergy, contrast nephropathy, nerve injury, and pain management.

Postembolization syndrome is a well-described phenomenon consisting of pain, fever, nausea, leukocytosis, and occasionally malaise. Symptoms of postembolization syndrome may last from 2 to 7 days. It is treated symptomatically. Early identification of patients with infection or uterine necrosis during the immediate postembolization period is challenging and the treating surgeon should always be aware of this potentially devastating complication.

Radiation exposure to maternal ovaries is also a cause of concern, premature menopause and infertility may occur after the procedure. The mean radiation exposure is approximately 4-65 cGy which is equal to radiation exposure for one to three barium enema. Technical variation as low dose fluoroscopy with pulsed fluoroscopic capability may reduce the radiation dose. Strict coning down the catheter to avoid the ovaries is also recommended. Sexual dysfunction is another unusual complication. Other non target embolization complications include damage to bladder, rectum, buttocks, limb necrosis and sciatic nerve at <1/1000 cases.

Major complications include pulmonary embolism, uterine ischemia, necrosis, septicaemia, multiorgan failure and death.

Postoperative period is very critical in such patients. Strict watch for features of internal haemorrhage is imperative. Broad spectrum antibiotics are required for long duration. In cases where placenta is left insitu, careful watch for infection and bleeding is required. Monitoring is mainly done by serial ultrasounds although bhcg levels are also followed.[3] Constant and prolonged follow-up is required, as conservative treatment may not be successful and patients may still land in hysterectomy.

When using the technique of UAE in patients with postpartum haemorrhage due to adherent placenta, the patient would have to be shifted from the operating room to the angiography room. However, only a small portion of such patients are thermodynamically stable to be transferred for UAE.

Recently the use of prophylactic hypogastric artery occlusion has been done to decrease intraoperative blood loss, specially in patients at high risk for peripartum hemorrhage.[6,7] This is accomplished by bilateral placement of embolizing materials and/ or balloon catheters in the femoral arteries under fluoroscopic guidance. Because any delay is eliminated, it is presumed that the blood loss will also be limited. Additionally this preoperative placement of balloon occlusion catheters also allows for intraoperative Gelfoam embolization, if so needed. The literature offers limited evidence on the utility of preoperative placement of catheter in the hypogastric artery, in decreasing blood loss and improving surgical outcomes.[5,6,7] Though there are studies suggesting embolization as a safe and effective arm for treatments of placenta accrete there is a difference of opinion too. It has also been suggested that the extensive network of collateral vessels present in the gravid pelvis may explain some failures of occlusive balloons, whereas collateral circulation from cervical, ovarian, rectal, femoral, lumbar, and sacral arteries may also contribute to the overall blood loss.[11,12]

However, the radiation exposure to the foetus and uterus during preoperative placement of balloon catheters remains controversial. The mean radiation exposure is 4-65 cGy which is equivalent to one to three barium enema. Detailed data on the effects of foetal and maternal uterine radiation exposure have not been reported. Furthermore, transfer of the patient from the angiography room to an operating room after prophylactic catheter placement can increase the complexity and risk of the procedure, particularly in unstable patients.[8]

Current evidence is insufficient to make a firm recommendation on the use of balloon catheter occlusion or embolization to reduce blood loss and improve surgical outcome, but individual situations may warrant their use (ACOG 2015).[1] Despite initial enthusiasm about the utility of balloon catheter occlusion, available data are unclear regarding its efficacy. Although some investigators have reported reduced blood loss, there have been other reports of no benefits and even of significant complications.

Even the RCOG has not recommended routine use of embolization for placenta accrete.[3]

Thus there are some important issues which must be addressed before recommending prophylactic intraoperative embolization of pelvic vessels in patients with placenta accreta:

1) Indication for which patients with placenta accreta needs prophylactic intraoperative embolization of the pelvic vessels.
2) Quality of fluoroscopy: A hybrid operation room equipped with high-quality fluoroscopy equipment would be ideal.
3) Method of catheter insertion: Preoperative placement of the catheter sheath into the femoral artery under ultrasonic guidance would avoid foetal radiation exposure and reduce the time of angiographic catheterization.

The role of interventional radiological procedure though looks promising, further research and prospective larger studies are required before recommending the procedure for management of placenta accrete and other placental abnormalities.

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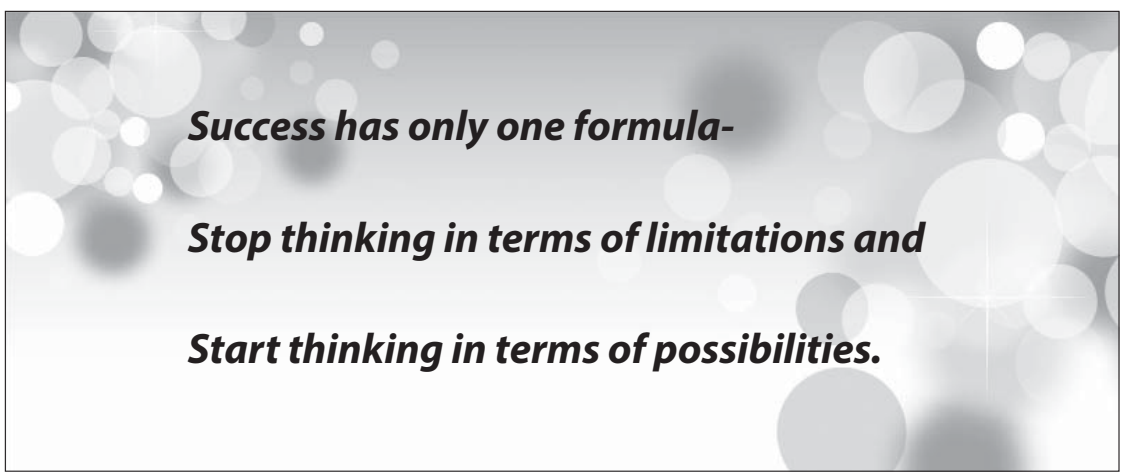

Journal Scan

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Abstract of the research articles are available free at the journal websites and on PubMed (http://www.ncbi.nlm.nih.gov/pubmed). A summary of the articles has been provided so as to put the findings of the articles into perspective for current clinical practice.

Relationship between first trimester aneuploidy screening test serum analytes and placenta accreta

Büke B, Akkaya H, Demir S, Sağol S, Şimşek D, Başol G, Barutçuoğlu B.

Citation: Büke B, Akkaya H, Demir S, Sağol S, Şimşek D, Başol G, Barutçuoğlu B. Relationship between first trimester aneuploidy screening test serum analytes and placenta accreta. J Matern Fetal Neonatal Med. 2017 Jan 17:1-7.

Study Question: Whether there is a relationship between first trimester serum pregnancy-associated plasma protein A (PAPP-A) and free beta human chorionic gonadotropin (fβhCG) MoM values and placenta accreta in women who had placenta previa.

Methods

- A total of 88 patients with placenta previa who had first trimester aneuploidy screening test results were enrolled in the study.
- Nineteen of these patients were also diagnosed with placenta accreta.
- As probable markers of excessive placental invasion, serum PAPP-A and fβhCG MoM values were compared in two groups with and without placenta accreta.

Results

- Patients with placenta accreta had higher statistically significant serum PAPP-A (1.20 versus 0.865, respectively, $p = 0.045$) and fβhCG MoM (1.42 versus 0.93, respectively, $p = 0.042$) values than patients without accreta.

Conclusion

Higher first trimester serum PAPP-A and fβhCG MoM values seem to be associated with placenta accreta in women with placenta previa. Further studies are needed to use these promising additional tools for early detection of placenta accreta.

Perspective

In this study the authors have investigated PAPP-A and fbhCG as probable markers of excessive placental invasion presuming that in contrast to poor placentation cases these levels will be higher in cases of placenta accreta associated with excessive trophoblastic invasion.

The cervix as a natural tamponade in postpartum hemorrhage caused by placenta previa and placenta previa accreta: a prospective study

El Gelany SA, Abdelraheim AR, Mohammed MM, Gad El-Rab MT, Yousef AM, Ibrahim EM, Khalifa EM.

Citation: El Gelany SA, Abdelraheim AR, Mohammed MM, Gad El-Rab MT, Yousef AM, Ibrahim EM, Khalifa EM. The cervix as a natural tamponade in postpartum hemorrhage caused by placenta previa and placenta previa accreta: a prospective study. BMC Pregnancy Childbirth. 2015 Nov 11;15:295.

Study Question: The objective of this study was to evaluate the efficacy and safety of the use of the cervix as a natural tamponade in controlling postpartum hemorrhage caused by placenta previa and placenta previa accreta.

Methods

- This prospective study was conducted on 40 pregnant women between June 2012 and November 2014.
- All participating women had one or more previous cesarean deliveries and were diagnosed with placenta previa and/or placenta previa accreta.
- Significant bleeding from the placental bed during cesarean section was managed by inverting the cervix 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.

Results

- The technique of cervical inversion described above was successful in stopping the bleeding in 38 out of 40 patients; yielding a success rate of 95%.
- Hysterectomy was required in only two cases (5%).
- The mean intra-operative blood loss was 1572.5 mL, and the mean number of blood units transfused was 3.1.
- The mean time needed to perform the technique was 5.4 ± 0.6 min.
- The complications encountered were as follows: bladder injury in the two patients who underwent

hysterectomy and wound infection in one patient. Postoperative fever that responded to antibiotics occurred in 1 patient.

- The mean duration of the postoperative hospital stay was 3.5 days

Conclusion

This technique of using the cervix as a natural tamponade appears to be safe, simple, time-saving and potentially effective method for controlling the severe postpartum hemorrhage (PPH) caused by placenta previa/placenta previa accreta. This technique deserves to be one of the tools in the hands of obstetricians who face the life-threatening hemorrhage of placenta accreta.

Perspective

This study describes experience with a technique for conservative surgical management of bleeding in cases with placenta previa accreta. This technique of cervical inversion was first described in a case report by Dawlatly et al (BJOG. 2007; 114:502–4. Here, the authors have described their experience with the use of this technique in 40 cases of placenta previa and/or placenta previa accreta. In another study by Sakhavar et al. describing use of this technique in 10 patients, the cervix was inverted in a similar way, after which the placental bed was sutured to control bleeding. However, after bleeding was controlled, the cervix was returned to its original position (Int J Gynaecol Obstet. 2015 Feb; 128(2):122-5).

Caesarean hysterectomy for placenta praevia/accreta using an approach via the pouch of Douglas

Selman AE

Citation: Selman AE. Caesarean hysterectomy for placenta praevia/accreta using anapproach via the pouch of Douglas. BJOG. 2016 Apr; 123(5):815-9.

Study Question: Does Posterior retrograde abdominal hysterectomy in women with placenta praevia/accreta enable safer surgery?

Methods

The author describes a modified surgical technique for caesarean hysterectomy which is similar to the radical retrograde approach used for en bloc resection of extensive pelvic disease, such as in women with ovarian cancer. This technique was assessed in women with an antenatal diagnosis of placenta praevia/accreta.

The steps of the procedure are:

- Classical cesarean is done and uterine incision is closed.
- The round ligaments are divided and ligated, and the broad ligaments are incised laterally and parallel to the infundibulo-pelvic ligaments to expose the retroperitoneum.
- Retroperitoneal space is carefully dissected.
- Anterior divisions of the internal iliac arteries are ligated.
- The utero-ovarian ligaments and tubes are divided and ligated bilaterally.
- Ureters are carefully identified, dissected and preserved through the anterior bladder pillar.
- Uterosacral ligaments and bladder pillars are sequentially divided and secured with suture.
- The vesicouterine space is developed cephalad by blunt dissection until the bladder is completely detached from the anterior aspect of the uterus.
- The posterior vaginal fornix is exposed by placement of a sponge stick into the vagina, which is opened transversely, 1–2 cm below the cervicovaginal junction. Hysterectomy clamps are used to circumscribe the vagina, sequentially dividing and securing each pedicle with a suture ligature.

Results

- Eleven women with placenta praevia/accreta underwent surgery using this protocol.
- The median patient age, gestational age, surgical time and hospital stay were 36 years (range 21–43), 36 weeks (26+2–38), 180 minutes (131–235) and 4 days (3–6), respectively.
- Of the 11 women studied, there were six cases of placenta percreta; three, two and one of these women presented histological evidence of penetration to the bladder, invasion through the myometrium and invasion to the paracolpos (cervico-isthmic corporeal pregnancy), respectively. The remaining five women had placenta increta (n = 4) or accreta (n = 1).
- Combined spinal–epidural anaesthesia was used for the caesarean delivery.
- Two out of the 11 women with major placenta praevia required blood transfusion.
- There were no intraoperative complications in any of the women.
- No postoperative complications were encountered using this approach.

Conclusion

This technique may enable safer surgery for women with anterior placenta praevia/accreta; however, analytical studies must be performed in the future to confirm its effectiveness and safety.

Perspective

This study describes an alternative technique for hysterectomy in cases with placenta previa accreta. However surgeon needs to be experienced with retroperitoneal anatomy and dissection to be able to perform this.

HISTORY

Placenta: A Biological Marvel

Nilanchali Singh[1], Ruchi Rai[2]

[1]Assistant Professor, Department of Obstetrics & Gynaecology, Maulana Azad Medical College; [2]Senior Resident, Department of Obstetrics & Gynaecology, ESI Hospital, Basaidarapur

"The exact cooperation of the embryo vascularization and the trophoblast with the mothers endometrial vasculature and glands in producing placental structures designed for both efficient interchange and barrier is one of the greatest biological marvels"

Harland W. Mossman, 1987

Since antiquity the placenta has been recognized as being of great importance & at times somewhat mysterious and even mystical. The placenta being a feto-maternal organ is characteristic of mammalian pregnancy. It differs from other organs as it's formed by interaction of both fetal and maternal tissue. For ages it is been handled by various ceremonies by many cultures around the world. The study of history of placental biology is very interesting and can be studied under various perspectives like embryology, morphology, variation by species, microscopic cellular organization, maternal & foetal circulation, metabolic immunologic and endocrine function. So many concepts related to placenta were resolved over several centuries.

Ancient Beliefs & Myths

In ancient times in Egypt placenta was believed to be the seat of the "external soul". The Hebrew sculptures include several references to the placenta sometimes referred to as the *"Bundle of life" & "The external soul" (Stirrat, 1998)*. In Pacific islands, Australia and Africa the placenta is regarded as sibling of the infant, a companion or sometimes possessing supernatural properties.*(Longo, 1963)*

In Africa the Yoruba tribe of western Nigeria, buries the placenta near the entrance of the home so that *"the child will always look back to his father"(Longo 1964)*

The Greeks acknowledged the importance of the placenta (flat cake) in precisely fetal nutrition. And named the outermost embryonic membrane chorion and the innermost membrane encompassing the foetus amnion(bowl).

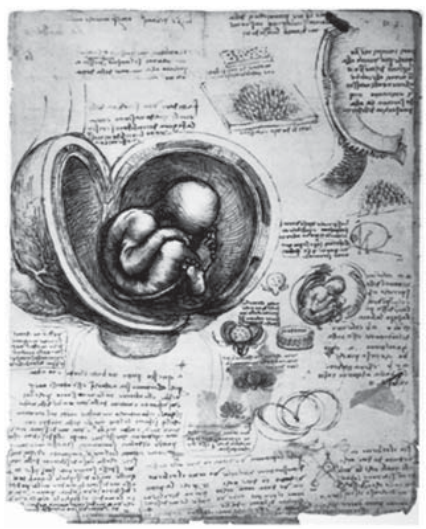
It was Aristotle (384-322 B.C.E) the Greek philosopher biologist who first coined the term chorion and also recognized the yolk sac of lower vertebrates (Aristotle, 1831-1870). In his great work of embryological treatise named De generatione animalium (circa 340 B.C.E) Aristotle stated that "The umbilical vessels join on the uterus like the roots of tryo receives he plant and through them the embryo receives its nourishment" (Aristotle 1831-1870)

The human fetus as depicted by Leonardo da Vinci, circa 1510. Leonardo observed "Just as the finger of the hand are interwoven one in the interval of the other. So these fleshy villi of the little sponges (named cotyledons) are interwoven like burrs, one half with the other".

Medieval Beliefs

'Placenta is the essence of life.. It symbolizes life, spirit and individuality.'

The famous Leonardo the Vinci (1492-1519) who combined science with aesthetics in his anatomical studies prepared magnificent illustrations of human



The human placenta with its distribution of umbilical vessels, as described by Nicolas Hoboken in 1669.

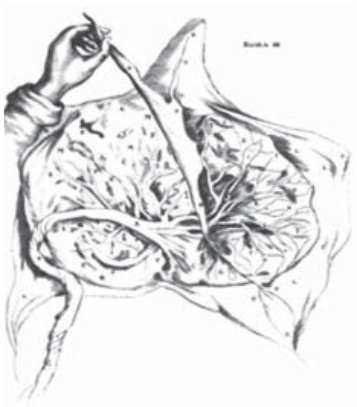
body and these art work now reside in royal library of Windson Castle, UK. Joseph Needham (1900-1995) noted what Da Vinci stated correctly that the fetal vasculature is not continuous with that of the mother. Andreas Vaselius (1514-1564) in his monumental work on the "Fabric of the human body" described human foetus as a single chamber.

A pupil of Vaselius and his succesors named Matteo Renaldo (Columbus)(circa 1510-1559) first coined the term Placenta (Colombo 1559)

Modern Perceptions

Galen's views were held as dogma until the discovery of circulation of the blood in the early 17th century. Galen described 4 stages of embryonic development: the seminal stage in which the embryo is a coagulum of semen & menstrual blood; the formation of tria principia (triad of principal organs) the brain, heart and liver; a third stage in which other structures develop; finally further growth and maturation of the embryo/ foetus.

There was a single dispute regarding the placental development biology from early 16th century through the 18th century and it was the extent to which the maternal and fetal vessels are interconnected. The study of anatomy experienced an awakening from the dawn during the period of renaissance which experienced rebirth of classical literature & learning. The origin was in Italy from 14th century and spread throughout the Europe.

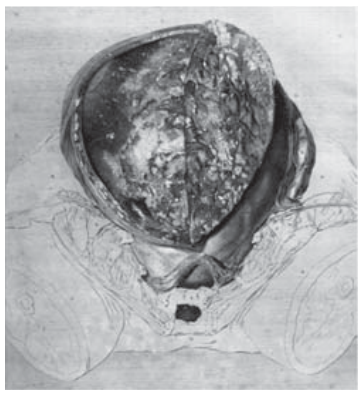


The human placenta as depicted in William Hunter's The Gravid Uterus of 1774. It shows an opened uterus at full-term, with the placenta folded to the right and decidua attached to the uterine wall on the left.

Till the 18th century the continuity of maternal and foetal circulation was believed (Cheselden, 1713). In 1734 Alexander Monro (1697-1767) an anatomist in Edinburgh clearly stated that there was no vascular continuity between the uterus and the placenta. Monro concluded that the tips of fetal vessels pass through the uterine decidua beyond the base of the placenta upto the maternal blood vessels. Many years later Wilhelm Noortwyck of Leiden was the first to inject the uterine vessels of a young women who died near term.

William Hunter (1718-1783), the anatomist-obstetrician, in his magnificient obstetric atlas "The Gravid Uterus" gave a very sophisticated definition of the placenta:

From all these experiments and observations which have been often repeated and diligently attended to, with no other desire than to discover truth, it seems incontestable that the human placenta, … is composed of two distinct parts, though blended together, viz, an umbilical, which may be considered as part of the foetus, and an uterine, which belongs to the mother; that each of these parts has its peculiar system of arteries and veins, and its peculiar circulation, receiving blood by its arteries, and returning it by its veins; that the circulation through these two parts of the placenta differs in the following manner: in the umbilical portion the arteries terminate in the veins by a continuity of canal, whereas in the uterine portion there are intermediate cells into which the arteries terminate, and from which the veins begin.



The human placenta as depicted in William Hunter's The Gravid Uterus of 1774. It shows an opened uterus at full-term, with the placenta folded to the right and decidua attached to the uterine wall on the left.

Suggested Reading

Longo LD1, Reynolds LP. Some historical aspects of understanding placental development, structure and function. Int J Dev Biol. 2010;54(2-3):237-55.

Proceedings of Monthly AOGD Clinical Meeting Lady Hardinge Medical College & Smt. S.K. Hospital New Delhi, 3rd February, 2017

Case1

Acute abdomen: A rare cause

Prabha lal, Ratna Biswas, Kiran Agarwal, Abha Singh

A 35 years old $P_2L_2A_1$ presented to gynecology emergency with chief complaints of pain and distension abdomen since 2 weeks with acute exacerbation of pain since one day. On examination patient was conscious but in severe pain. Her vitals were normal. P/A & P/V findings was suggestive of? malignant ovarian tumor with torsion. Emergency exploratory laparotomy was planned. Operative findings at emergency laparotomy revealed presence of sigmoid colon mass along with bilateral ovarian masses with torsion of right mass. Total abdominal hysterectomy with bilateral salpingo-ophorectomy, total omentectomy, para-aortic lymphadenectomy wide excision of colon growth with end to end anastomosis with colostomy was done. Histopathology confirmed the presence of signet ring cell adenocarcinoma of ovary with adenocarcinoma colon as Krukenberg tumor. Immunohistochemistry came positive for CK20 & negative for CK7further adding to confirmation of metastatic nature of ovarian tumor with primary as colon carcinoma. Patient received chemotherapy as FOLFOX regimen for10 cycles. Reason for presentation of this case was due to its rare presentation of primary malignancy (colonic malignancy) as gynaecological emergency and rare occurence of krukenberg tumor as a cause of acute abdomen due to torsion.

Case2

Catamenial Diabetic Ketoacidosis: A Management Dilemma

Sakshi Nayar, Manju Puri

Catamenial word is derived from a greek word *katomenios,* meaning monthly. A number of illnesses such as epilepsy, asthma, pneumothorax, hemothorax and hemoptysis have monthly association with menstrual cycle. Diabetic ketoacidosis, although rare, is also one such condition known to have catamenial association. We present a 37 year old lady, referred to us by the physicians as a diagnosed case of catamenial diabetic ketoacidosis. She was diagnosed to have type 1 diabetes mellitus at the age of 18 years and has been on insulin since then. She gave history of multiple hospital admissions in view of repeated episodes of nausea, vomiting and abdominal pain associated with periods. However, her sugars were fairly well controlled in between the periods. She was managed with extended regimen of oral contraceptive pills with withdrawal bleeding every 3- 4 months.

Case 3

MCA Doppler for fetal anemia: Should we have regional reference values ?

Manisha Kumar, Tarul Umrawal

Rh isoimmunization is the commonest cause of fetal anemia. Estimation of fetal anemia is important for management of such cases. There are regional differences in reference charts and has there been no centile charts for normal fetal haemoglobin value. **Aims & Objectives:** To see the correlation between fetal middle cerebral artery peak systolic velocity (MCA PSV) and corresponding cord blood hemoglobin from 24 to 40 weeks gestation and to construct fetal hemoglobin chart for each gestation. **Materials & Method:** In this observational cross-sectional study, 300 pregnant women, between 24- 40 weeks gestation, likely to deliver within 72 hours were taken. Antenatal ultrasound and Doppler study was performed and cord blood hemoglobin estimation was done at delivery. Regression analysis was done to correlate, MCA PSV and cord blood hemoglobin values for each gestation. **Results:** There was an increase in MCAPSV and cord blood Hb with advancing gestational age. The cord blood Hb was found to have significant inverse correlation with MCA PSV. The MOM values of MCA PSV and fetal hemoglobin were calculated, chart for mild, moderate and severe anemia was constructed. A review of our experience with the management of Rh isoimmunization showed that, intrauterine transfusion was required in 15.8% (10/38) cases, Mean gestational age of delivery was 35 weeks, Mean Hb at birth was 7gm%. **Conclusion:** The constructed charts can be used as reference for our Indian population. In the present short retrospective analysis, we found it to correlate more with actual fetal cord blood hemoglobin level compared to chart given by Mari et al.

Case 4

Bleeding Cervical Mass-Diagnostic Dilemma

Supriya Goyal, Kiran Agarwal, Sharda Patra, Abha Singh

Primary choriocarcinoma of the cervix is a very rare entity. We present a case of cervical choriocarcinoma, which was initially misdiagnosed as cervical fibroid with incomplete abortion. The delay in diagnosis led to sudden catastrophic vaginal bleeding which resulted in an emergency hysterectomy. The patient was a 40 year old multipara presented in our OPD with a history of irregular bleeding per vaginum since evacuation for incomplete abortion (from outside) 3weeks back with a report of USG showing a mass in the cervix (fibroid) and β –HCG level of 85,958 mIu/ml. Clinical examination revealed a 4 ×5 cm necrotic, hemorrhagic mass on the posterior lip of cervix with invasion to the left parametrium and lateral vaginal wall. She underwent emergency total hysterectomy with removal of left parametrium and left sided hemi colpectomy. Histopathology report revealed cervical choriocarcinoma involving vagina, FIGO stage 3b (multiple metastasis in both lung field and residual pelvic mass). Remission of cervical choriocarcinoma was accomplished with combination chemotherapy (EMACO & EMA-EP) **Conclusion:** Primary cervical choriocarcioma should be considered in women in the reproductive age group presenting with a bleeding cervical mass with or without amenorrhoea.

Association of Obstetricians & Gynecologists of Delhi (AOGD) Elections

Nominations are invited from eligible AOGD members for the posts of

President and Vice President of AOGD for the year 2019-2020.

The nomination should be Proposed by one AOGD life member and seconded by two AOGD life members. The last date of filing the nominations is **30th May 2017.**

Eligibility criteria

1. President AOGD has to be a faculty of medical colleges / leading, multidisciplinary clinic hospital with Para-clinic and clinical departments (oncology, radiology, pathology etc).
2. Experience of having been chairperson of committee of AOGD/FOGSI or experience as Vice President/Secretary/Treasurer/Editor of AOGD.
3. Life member AOGD having above 10 years of experience in specialty after post –graduation and holding post of professor/senior consultant for more than 7 years.
4. Experience of conducting conferences, seminars or workshops etc.
5. In case of a tie after election, the senior most person out of the contestants will be nominated.

The application should be sent to the AOGD Secretariat, GTB Hospital, Delhi – 110092 by **30th May 2017.**

Crossword - Placenta and its Abnormalities

Compiled and designed by Monica Sahu[1], Bhoomika Tantuway[1], Sangeeta Gupta[2]
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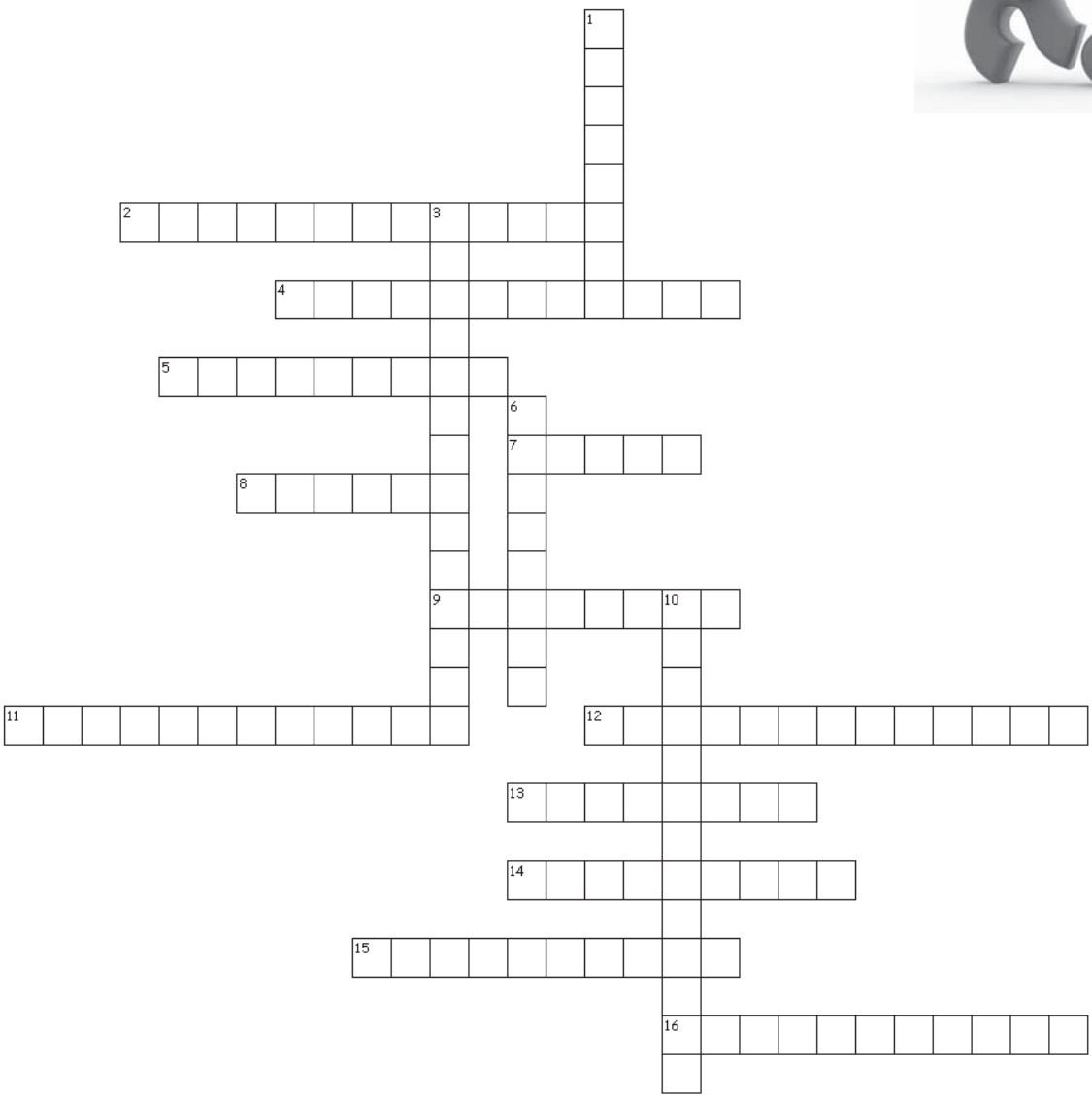

Across

2. Additional lobule separate from the main part of placenta is called _____ lobe?
4. The two layers zona compacta and zona spongiosa together form the zona _____
5. The functional unit supplied by each main stem villus is called?
7. The maternal surface of the placenta is called the _____ plate.
8. Human placental formation begins when zygote is at _____ stage.
9. Defective formation of _____ layer of placenta leads to placenta accreta
11. In _____ type of placentation the chorionic plate fails to extend to the periphery of the placenta and is smaller than the basal plate.
12. The membranes are described as "doubled back" over the fetal surface of which type of placenta?
13. The prolactin like activity in the human placenta is due to _____
14. At what period of gestation the placental and the fetal weights are almost equal?
15. The decidua overlying the enlarging blastocyst and initially separating the conceptus from rest of the uterine cavity is called _____
16. In placenta _____ all or a large part of the fetal membranes are covered by functioning villi

Down

1. In which type of placenta the villi penetrate the myometrium and through to uterine serosa?
3. Grey scale ultrasound criteria for diagnosing placenta accreta is loss of _____ sonolucent zone
6. Interruption of the placenta by partial or complete separation is called _____ placenta
10. Which is the most common tumour of the placenta?

Tickle the Funny Bone

Compiled by Dr Pallavi Sharma
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- A tennis player gets tennis elbow. An athlete gets athlete's foot. What does a gynecologist get?
  Tunnel vision
- A woman gets into a taxi and asks:
  - To maternity hospital, pleas

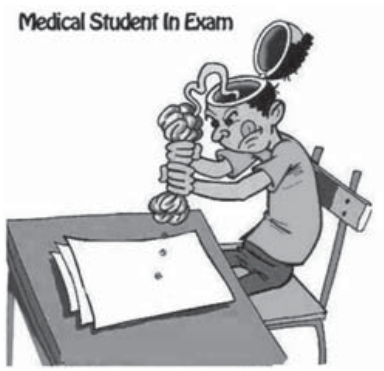
  After a while she asks the driver:
  - Do not drive so fast, please, I'm simply working there
- Laughter is the best medicine, But if u are laughing without any reason, u need medicine..! ;)

Aaj ka superhit. . . .

Orthopedic Surgeon : Ab tum chal sakte ho..... lekin koi walker lena padega...

Santa : Dr Saheb

JohnyWalker ले लुं .....???



Answers: Crossword - Placenta and its Abnormalities

Across

2. Succenturiate
4. Functionalis
5. Cotyledon
7. Basal
8. Morula
9. Nitabuch
11. Extrachorial
12. Circumvallate
13. Lactogen
14. Seventeen
15. Capsularis
16. Membranacea

Down

1. Percreta
3. Radiolucent
6. Abruptio
10. Chorioangioma

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Department of Obstetrics & Gynecology
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www.aogd.org. Email: aogd@aogd.org, info@aogd.org

WHITE PAPER

Every baby deserves a healthy life

Newborn Screening - A public health revolution akin to the preventive program of immunization

Newborn Screening is a preventive health measure to detect disorders not clinically visible at birth but can cause significant morbidity and mortality. The process is simple and involves a few drops of blood collected by a small lancet on a piece of filter paper. Up to 40 disorders can be tested on this sample. The test has to be performed anytime after 24 hours of birth and ideally less than 7 days after birth. A template disorder, which is the most important preventable cause of mental retardation, is Congenital Hypothyroidism.

Congenital Hypothyroidism (CH)

Congenital hypothyroidism occurs when the thyroid gland fails to develop or function. The common causes are agenesis of the thyroid gland, ectopic location of the gland and dyshormonogenesis (failure of any of the hormones to be synthesized). Mothers with hypothyroidism, when euthyroid do not cause any of the above mentioned conditions. Left undetected, it leads to intellectual disability and abnormal growth. Treatment must be started within the first 2 weeks of life of infants to prevent development of mental retardation, learning disabilities, and/or growth delays.

CH India Perspective

Globally, the incidence of CH is about 1:3000 or 1:4000. In India, preliminary research indicates that it is much higher at 1:1130.[1]

Disorder Screened	Prevalence	Effect if not screened	Effect if Screened & Managed	Management
Congenital Hypothyroidism (CH)	1:1130	Severe mental retardation, intellectual disability and abnormal growth.	Normal, if treatment begins in the first month after birth.	Daily oral dose of thyroid hormone (thyroxine)

References:

1. ICMR Multicentric Study (2007-2012)

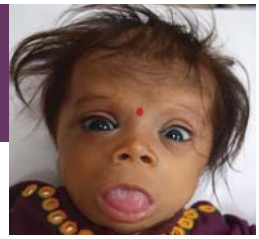
Why it is important – A Case Study

A simple blood test would have changed his life - encourage newborn screening. There is nothing more encouraging for an obstetrician to see a healthy fetus grow into an active productive child what can be better than a preventive measure right when the newborn is still under your care.

This baby Laxman now nine months old does not even hold neck and has global developmental delay. The mother is tired of his constipation. She reports that he was born healthy with good APGAR scores. The obstetrician had congratulated her on the birth of a healthy child. Somewhere something went wrong.

Her neighbour who has just been blessed with a baby daughter has undergone a heel prick test.

Baby Laxman was not screened after birth and later it was found that he is suffering from Congenital Hypothyroidism (CH). If Newborn Screening was done in time, the situation would have been in favor of this little child.



Rinki was blessed with a baby girl at the same time when Laxman was born, but she knew about Newborn Screening. After getting her baby screening, it was found that her baby is also suffering from CH. Today after 9 months, her little angel is healthy and leading a normal life.

CH prevention with Newborn Screening

This baby has congenital hypothyroidism. Imagine that a very low cost intervention in the form of supplementation of L Thyroxine could have ensured normal growth and development of this child. Let us all give our promise to encourage newborn screening.

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