Retrospective study of placenta accreta, placenta increta and placenta percreta in Peripartum hysterectomy specimens

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ABSTRACT
Background: Abnormal placentations such as placenta accreta, placenta increta and placenta percreta are important causes of hemorrhage after delivery causing maternal morbidity and mortality. Risk factors for abnormal placentation are prior caesarean section, placenta previa and pre-eclampsia. There is a need for reliable antenatal diagnosis for these serious conditions. If these pregnancies can be identified, antepartum, site and time of delivery as well as the surgical approach can be planned ahead; this decreases the incidence of maternal mortality due to massive hemorrhage. Aim: (1) To study the incidence of abnormal placentation in emergency peripartum hysterectomy specimen. (2) To evaluate various risk factors associated with abnormal placentation. Materials and Method: Retrospective cross-section study done in patients with abnormal placentation leading to emergency peripartum hysterectomy during a course of eight-year period. Result: We received total of 18 emergency hysterectomy specimens during eight-year period of which placenta accreta accounts 55.5 percent (10/18), placenta increta upto 38.8 percent (7/18) and placenta percreta 5.5 percent (1/18). Analysis of result with parity shows uniparous women up to 22.2 percent (4/18), and multiparous women 77.7 percent (14/18). Risk factor analysis shows previous caesarean section in 55.5 percent (10/18), placenta previa in 33.3 percent (6/18) and pre-eclampsia in 11.1 percent (2/18). Conclusion: In our study, among abnormal placentation, incidence of placenta accreta accounts for 55.5 percent and it is more common in multiparous women than uniparous women. Among risk factors in our study, previous caesarean section is commonly associated with abnormal placentation followed by a placenta previa and pre-eclampsia.

KEY WORDS: Peripartum, placenta accreta, placenta increta, placenta percreta, pre-eclampsia

INTRODUCTION
Normal placentation and implantation are important for successful pregnancy outcome. Late complications of pregnancy such as pre-eclampsia and preterm labour have their pathogenesis early in pregnancy due to abnormal placenta development and implantation. Implantation of placenta in human involves three stages:
1. Initial adhesion of the blastocyst to the uterine wall known as apposition—this is unstable process
2. In second stage, micro villi present on syncytiotrophoblasts interdigitate on the apical surface of the luminal epithelium
3. In the last stage, there is increased physical interaction between the trophectoderm and the uterine luminal epithelium.[1]
attachment of placenta to myometrium—placenta accreta,[4] extension of trophoblast into myometrium—placenta increta or invasion through myometrium into adjacent organs—placenta percreta.[5] Etiology of pre-eclampsia is unknown, however, improper cytotrophoblast invasion and restricted endovascular invasion is likely considered as pathological event.[5-8]

MATERIALS AND METHOD

This is retrospective cross-section study done on emergency peripartum hysterectomy specimen during course of eight years period from 2010 to 2018 to know the incidence of abnormal placentation.

Total 18 emergency peripartum hysterectomy specimens due to abnormal placentation were received during study period. Age group of patients in our study was between 30 and 36 years.

Inclusion criteria
1. Pregnant women with abnormal placentation diagnosed by ultrasound
2. Pregnant women with placenta previa
3. Multiple pregnancy
4. Previous caesarean section
5. Advanced maternal age
6. Pregnant women with late complications such as pre-eclampsia, preterm labour.

Specimen reception and grossing
We received fresh specimen in formalin-filled container labelled with patients’ names, IP numbers along with proforma containing clinical details of patient and relevant history from obstetrics and gynaecology department of our hospital.

Specimen types include peripartum uterus with cervix along with placenta in situ or in some cases, fragmented pieces of placenta after attempted removal. Grossing technique focus on:
   a. Proximity of invasion of placenta to uterus and its distance from cervix
   b. Implantation whether anterior or posterior
   c. Depth of invasion
   d. Involvement of any surrounding structure like bladder.

Bread loaf sections of posterior uterine wall to assess myometrial invasion in case of placenta increta and placenta percreta is done.

These findings were confirmed on histopathological examination.

Slide review and reporting
After staining the slide with haemotoxylin and eosin stain, microscopic examination of section is done if there is lack of decidua between placental villi and myometrium; it indicates placenta accreta. Assessment of myometrial invasion by trophoblast is done in case of placenta increta and percreta.

RESULT

Of total 18 peripartum hysterectomy specimens we received during our study period, Table 1 summarises the incidences of abnormal placentation. Table 2 summarises association of parity with abnormal placentation. Risk factors such as previous caesarean section, placenta previa and pre-eclampsia are summarised in Table 3.

DISCUSSION

Placenta accreta refers to placenta that is abnormally adherent to uterus [Figure 1a], placenta increta when placenta invades the myometrium [Figure 1b] and placenta percreta when placenta invades the myometrium and serosa sometimes even perforate into adjacent organs like bladder [Figure 1c].

Abnormal placentation can be diagnosed microscopically by assessing degree of trophoblastic adhesion or invasion into myometrium. Placenta accreta seen microscopically as placental villi interdigitating into a uterine myometrium without an intervening decidual plate [Figure 2a]. Morphologic subtypes of this condition are designated as placenta increta when the villi invade the myometrium [Figure 2b] and placenta percreta when the villous infiltration extends through the whole thickness of the myometrium and serosa sometimes even perforate into adjacent organs like bladder.

Placenta accreta result from absence or deficiency of Nitabuch’s layer or spongious layer of decidua.[9] Histology shows trophoblastic tissue invading myometrium without intervening decidua.[9] This causes massive bleeding as placenta does not separate after delivery and need for emergency peripartum hysterectomy to prevent maternal mortality.

Of total 18 peripartum hysterectomy specimens we received during study period, incidence of abnormal placentation is as follows: placenta accreta accounts for 55.5 percent (10/18),

Table 1: Incidence of abnormal placentation

| Abnormal placentation | Total number of cases | Percentage |
|-----------------------|-----------------------|------------|
| Placenta accrete      | 10                    | 55.5       |
| Placenta increta      | 07                    | 38.8       |
| Placenta percreta     | 01                    | 5.5        |

Table 2: Relationship of abnormal placentation with parity

| Parity         | Number of cases | Percentage |
|----------------|-----------------|------------|
| Uniparous      | 4               | 22.2       |
| Multiparous    | 14              | 77.7       |

Table 3: Risk factors associated with abnormal placentation

| Risk factor    | Number of cases | Percentage |
|----------------|-----------------|------------|
| Previous LSCS  | 10              | 55.5       |
| Placenta previa| 6               | 33.3       |
| Pre-eclampsia  | 2               | 11.1       |
placenta increta 38.8 percent (7/18) and placenta percreta 5.5 percent (1/18).

Similarly, in the study done by Breen JL et al. and Neubecker R et al.,[10] incidence of abnormal placentation including placenta accreta, placenta increta and placenta percreta ranges from 1 in 540 to 1 in 93,000 deliveries.

Placenta percreta is most serious among abnormal placentation as placenta invades through myometrium and serosa, even beyond the serosa sometimes leading to catastrophic blood loss. Also, causes multiple complications such as acute respiratory distress syndrome, sheehans syndrome, renal failure and even death. Placenta percreta causes very high maternal mortality and morbidity up to 10 percent.[11]

In our study, incidence of abnormal placentation is more in multiparous women (77.7 percent) compared to uniparous women (22.2 percent); no such data on comparison of parity is found in other studies.

Placenta accreta lead to massive hemorrhage and complications such as DIC, injury to ureter, bladder, ARDS, Renal failure and death.[12,13] Placenta accreta causes higher incidence of caesarean hysterectomy in several hospitals.[14] Rarely placenta accreta also lead to spontaneous rupture of uterus during second and third trimester of pregnancy.[15]

Risk factors correlation in our study shows higher association in women with previous caesarean section (55.5 percent) followed by a placenta previa (33.3 percent) and pre-eclampsia (11.1 percent).

Similarly, Miller and colleagues concluded that placenta accreta incidence is increasing and results in more number of caesarean delivery rate.[16] Wu and Colleagues concluded that placenta accreta more frequently occur in women with one or more prior caesarean deliveries, and who have placenta previa in a current pregnancy.[17] Clarke and colleagues concluded that presence of placenta previa increases the risk of having placenta accreta from 24 percent in women with one prior caesarean delivery to 67 percent with three or more prior caesarean section.[18]

Reliable antenatal diagnosis of at risk cases to identify and have planned surgical approach to prevent massive blood loss so that morbidity and mortality decreases. According to Finberg HJ, Williams JW, 75 percent of cases of placenta percreta are associated with placenta previa. A total of 25 percent of women with a placenta previa and one previous caesarean delivery have placenta accreta or percreta whereas almost 50 percent with placenta previa and two previous caesarean deliveries have placenta accreta or percreta.[19]

Mostly, placenta percreta cases are diagnosed at the time of delivery; some suggested antenatal diagnosis by ultrasound or MRI in patients with clinical history of previous caesarean section, previous uterine surgery, suction dilatation and curettage.[20]

However, there is lack of data about how accurate is prenatal diagnosis of placenta increta or percreta. Antenatal detection rate of abnormal placentation on ultrasonography varies in literature from 33 percent (4/12) according to Finberg HJ,[19] to 100 percent (5/5) according to Lam G Kuller, MC Mohan et al.[21] According to Chou MM et al. and Chen WC et al., 7 out of 45 patients exhibit characteristics 2D ultrasound for a placenta increta or percreta.[22] Shih JC et al. and Palacious et al. considered 3D power doppler in antenatal diagnosis of placenta accreta.[23] Timmermans et al. reviewed efficacy and safety of conservative management of an abnormally invasive placenta.[24] Conservative management like attempted forcibly ablation of placenta increta or percreta is needed to achieve a hemostasis and partial resection of adjoining organs.

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There are no conflicts of interest.

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