

Histopathological Evaluation of Peripartum Hysterectomy Specimens: A Hospital based Study

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Abstract

Aim of the study: Peripartum hysterectomy is a life-saving procedure for post-partum haemorrhage. Aim of this study is to assess the histopathological findings in these specimens and find any correlation with history of previous caesarean sections and other clinical indications.

Material & Methods: This is a retrospective cross-sectional study on the histopathological examination of 34 specimens received in a tertiary care hospital of metro city during period of January 2023 to December 2024.

Results : In this study patient's age ranged from 20-38 years. 32/34 (94.1%) were multigravida while primigravida constituted 2/34 (5.8%). Previous history of LSCS was seen in 41% cases. Histopathological examination revealed Abnormal placentation in 20.5% (7/34), Exaggerated placental site reaction was seen in 8/34 (23.5%).One case showed features of uterine rupture with Placenta accreta. Histological feature of vasculitis favouring DIC supported by haematological studies was noted in 1/34 cases (2.9%) and nonspecific Inflammation was seen in 20/34 (58.8%) cases.

Conclusion: Increasing incidence of abnormal placentation is being noted as more number of caesarean sections are being performed, thus making adherent placenta as a common histopathological finding. Study also aimed to find the associations of other demographic and clinical parameters associated with intractable haemorrhage and followed by peripartum hysterectomy.

Keywords: Adherent placenta, Caesarean section, Exaggerated placental site reaction, Histopathology, Hysterectomy, Placenta accrete spectrum(PAS).

Introduction

Peripartum hysterectomy(PPHy) is a surgical procedure performed under serious obstetric conditions, generally for uncontrollable haemorrhage when conservative measures fail. This procedure, while life-saving, results in loss of fertility and is associated with considerable maternal morbidity and mortality. The incidence of PPHy varies, ranging between 0.035% to 0.54% worldwide, as mentioned in a Meta analysis (Umezurike CC et al.,2008; Van Den Akker et al.,2016). In present study the incidence noted was 0.14 in year 2023 and 0.19 in year 2024 (average 0.17%).

Historically, uterine atony and rupture are leading causes of PPHy. In recent times, the paradigm has shifted towards abnormal placentation, owing to a swell in caesarean section (CS) rates. Conditions such as placenta accreta, increta, and percreta, collectively nominated placenta accreta spectrum (PAS) (Hecht JL et al.,2020) have emerged as critical indications for PPHy. (Daskalakis G et al.,2007).

Microscopic findings of Placenta accreta involves direct villous attachment to the myometrium, while increta and percreta signify deeper invasions. When these placentas fail to detach during the third stage of labour, catastrophic haemorrhage may ensue, necessitating hysterectomy (Mehrabadi A et al.,2015).

Another important histopathological finding in this study was Exaggerated placental site reaction (EPSR) i.e. presence of multinucleated trophoblastic cells in the myometrium. EPSR is thought to be a condition consisting of an excessive number of implantation site intermediate trophoblasts (ISITs) (Takebayashi A et al.,2014).

Other indications include uterine rupture, particularly in scarred uteri, retained products of conception and uterine atony. Atony results from the uterus' inability to contract post-delivery, often due to retained placenta, infection, or over distension (Khan SM et al.,2014; Kavitha B et al.,2018).

The study was undertaken with the aim to assess the histopathological findings in these specimens and find any correlation with previous caesarean sections as well as with the clinical indications.

Materials and Methods

This cross-sectional study was conducted in a tertiary care centre in Delhi, over a two-year period (2023 and 2024). Total 34 hysterectomies performed for obstetric indications were included. Clinical data including age, gravida, parity, gestational age, history of previous caesarean section and clinical diagnosis were recorded. In addition, interval between FTVD and hysterectomy was also noted. Specimens were fixed in 10% formalin, grossed systematically, and sampled as per protocol. Sections were processed using automatic tissue processors, embedded in paraffin, and stained with Haematoxylin and Eosin (H&E).

Histopathological diagnoses were categorized into placental abnormalities, inflammatory changes, rupture, DIC-related changes, and others. Data analysis was performed using SPSS 21 using tests as appropriate.

Results

Among 19681 total deliveries performed during the study period, 34 cases (0.17%) were peripartum hysterectomies done under circumstances of life threatening complications. All patient were of young age ranged from 20 to 38 years (mean 29.6 years).

In this study 32/34(94.1%) were multigravida women and 2/34 (5.8%) were primigravida. History of previous Caesarean section (CS) was noted in 14/34 (41.1%) women while 20/34 (58.8%) cases had normal vaginal delivery.

Maternal mortality was reported in 3/34 (8.8%) cases and Foetal mortality in 4/34 (11.7%) cases.

9/34 specimens sent for Histopathological examination(HPE) had retained placenta along with uterus.HPE revealed EPSR in 8/34 (23.5%) cases and PAS in 7/34(20.5%) cases including Placenta

accrete, increta and percreta as most common findings whereas uterine rupture and DIC were least common as shown in (Table 1). Inflammatory changes recorded separately as additional finding. In this study 1/34 cases was operated in the first trimester followed by 11/34 in second and 22/34 in third trimester. Interval between the delivery and hysterectomy ranges from few hours to 11 days. In one case the peripartum hysterectomy was performed immediately due to uterine rupture. This interval period had no correlation with the gestation period.

The interval between the delivery and hysterectomy showed a significant correlation with previous LSCS history (p value-0.039). The number of previous LSCS had no bearing with the interval. PAS along with EPSR on histology as a group was correlated with different parameters like Age group, gravid status, trimester, history of previous LSCS and inflammation and there was no significant correlation.

Figure format:

Fig 1: ---Figure 1- Gross image showing hysterectomy specimen with adherent placenta

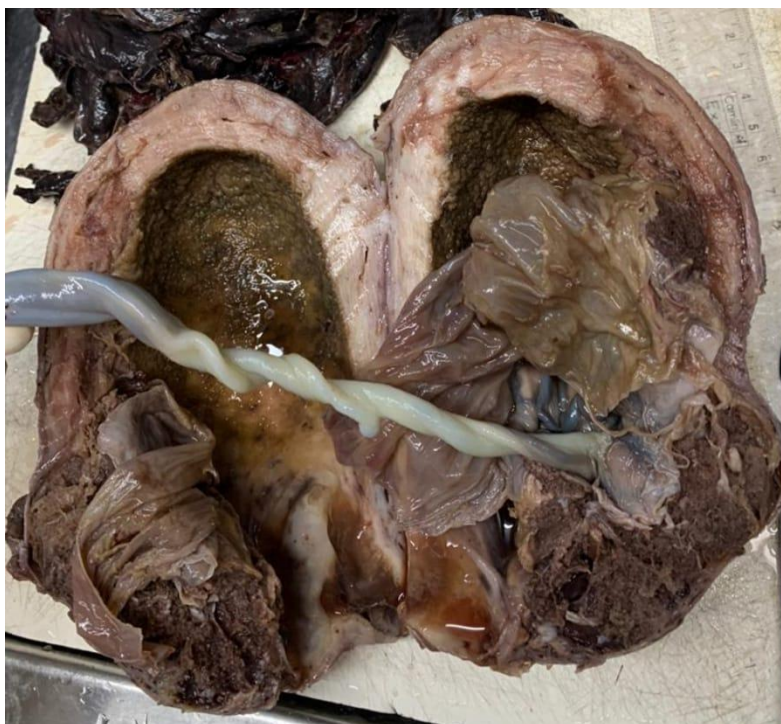


Fig 2- Microscopic examination showing inflammatory infiltrate in decidua, feature suggestive of Deciduitis.(H&E, X400)

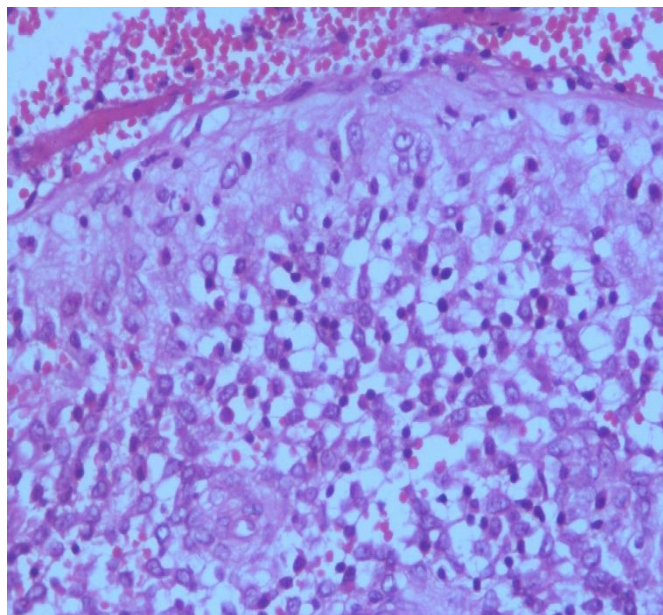


Fig 3- Histopathological examination showing chorionic villi (arrow) infiltrating myometrium suggestive of Placenta increta (H&E, X40)

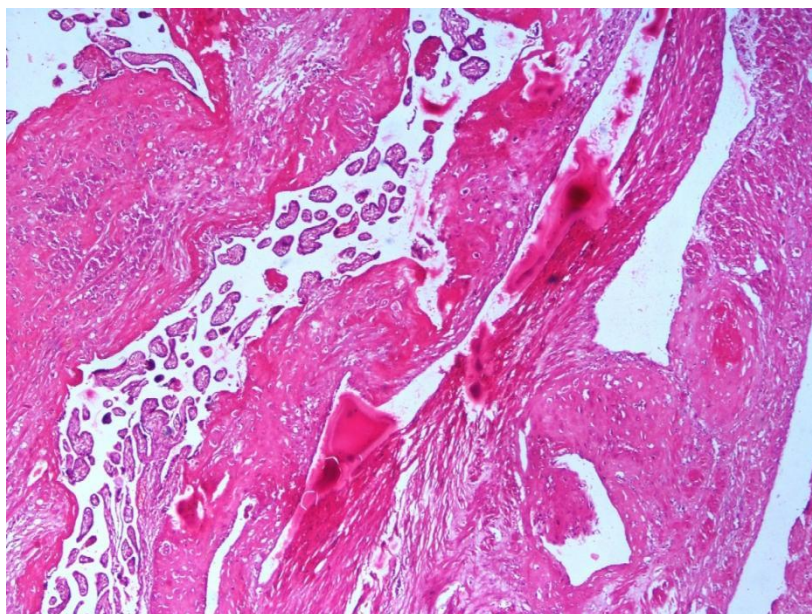


Fig 4- Microscopic examination showing Placenta increta (H&E, X100)

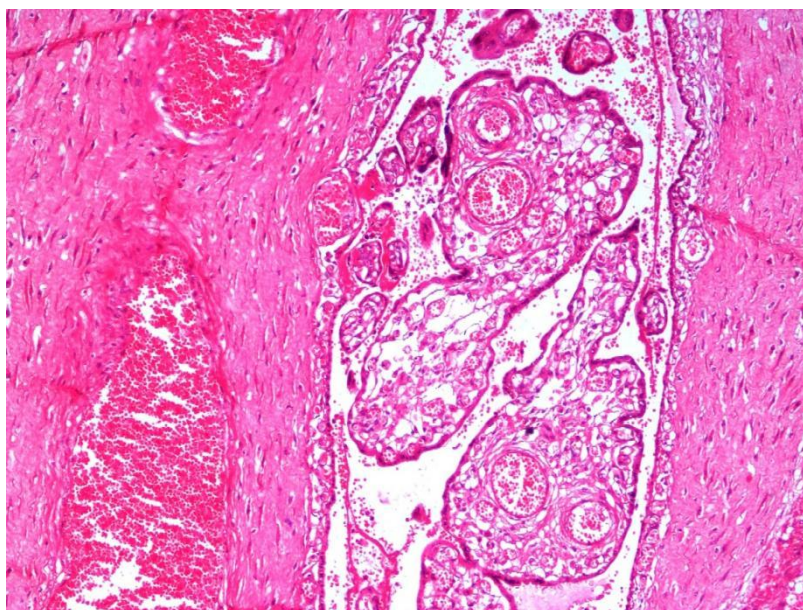


Table I- Histopathological findings

Histopathological findings	No. of cases	Percentage
EPSR	08	23.5
Placenta accreta	03	8.8
Placenta increta	03	8.8
Placenta percreta	01	2.9
Uterine Rupture	01	2.9
DIC	01	2.9
Inflammatory changes	20	58.8

Discussion

The incidence of peripartum hysterectomy in our study is 0.17% in year 2023-2024. This was found to be consistent with study conducted in tertiary care centre by GD Pukhrambam et.al.(0.15%) (Pukhrambam GD et.al., 2020).

In this study all the obstetric hysterectomies were performed in women in their second and third decades of life ranging from 20 to 38 years (mean 29.6 years) which is in concordance with other workers; mean age 28.5 years and 30.5 years respectively, (Awale RB et.al., 2019; Shahid R et.al., 2020). This age distribution reflects the peak reproductive years, during which obstetric complications are more likely to occur. However, isolated cases in older age groups have also been documented including women in their fifth decade, highlighting that advanced maternal age remains a relevant risk factor (>35 years) (Okogbenin SA et.al., 2003).

From a histopathological standpoint, analysis of the excised uteri plays a critical role in not only validating the clinical indication for hysterectomy but also in uncovering the underlying pathophysiology responsible for haemorrhage. In our study, abnormal placentation emerged as one of the important histopathological finding (20.5%). This observation is corroborated by other studies, which emphasized the rising trend of aberrant placental attachment as a principal contributor to peripartum hysterectomy (Okogbenin SA et al., 2003; Bala R et al., 2015; Chibber R et al., 2012). Recent data indicate a marked global increase in abnormal human placentation, which may present either as a positional anomaly (placenta praevia) or as an invasive adherence disorder (placenta accreta spectrum). Key risk factors include prior caesarean deliveries, uterine surgeries, and advanced maternal age (Huque S et al., 2018). Typically, abnormal placental adherence develops in areas of previous uterine scarring or thinning. It is proposed that defects in trophoblastic differentiation or disruptions at the deciduo-myometrial interface can promote deep placental invasion. Such abnormalities hinder normal placental detachment during the third stage of labour, leading to life-threatening haemorrhage and necessitating emergent hysterectomy.

Our findings also affirm prior cesarean section (41%) as a major predisposing factor (Okogbenin SA et al., 2003; Bhattacharyya R et al., 2016). Cases involving morbidly adherent placenta at prior cesarean scar sites were notably associated with uncontrolled postpartum haemorrhage, often culminating in hysterectomy. However PAS was not necessarily seen immediately in the scar.

In present study Histopathological evaluation also revealed another important finding of exaggerated placental site reaction (EPSR). Literature suggests that excessive trophoblastic proliferation may signal abnormal placentation, particularly in regions with poor decidualization and diminished myometrial thickness, such as the scarred lower uterine segment (Takebayashi A et al., 2014; Cramer SF et al., 2017).

The distinction between a normal placental site and EPSR is somewhat arbitrary because there is no reliable data quantifying the amount and extent of trophoblastic infiltration at different stages of normal gestation (Shih IM et al., 2001). These histologic features warrant further study to assess their diagnostic and prognostic value in placenta accreta spectrum disorders. There has been a reported association between EPSR and PAS but has not been found in any of our cases. (Cramer SF et al., 2017) Uterine atony was clinically diagnosed in 15 cases (23.3%) in our study. Previous work by Bala et al. identified uterine atony as the leading indication for obstetric hysterectomy (Bala R et al., 2015). The comparatively lower incidence in our cohort may be attributed to improved perinatal care and stricter adherence to labour and delivery protocols.

Total 20/34 cases showing inflammation as additional histopathological finding, 9 were associated with atony, however statistically insignificant. Notably, Hernandez et al. described histologic features of uterine atony to include acute inflammation and intrauterine infection, along with placental inflammatory lesions such as chorioamnionitis and vasculitis (Hernandez JS et al., 2012).

Despite these insights, the complex interactions at the feto-maternal interface remain insufficiently understood and merit further investigation.

Conclusion

This study underscores Placenta accreta spectrum and Exaggerated placental site reaction as the leading histopathological diagnosis in peripartum hysterectomy specimens. It also highlights the rising trend of abnormal placentation in these specimens closely linked to previous caesarean delivery. Histopathological evaluation plays a vital role in identifying underlying causes, guiding future obstetric practices.

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