

Histopathological Study of the Tissue following Early Pregnancy Failure at a Tertiary Care Centre

Swati Gupta,¹ Suspana Hirachand,² Apeksha Bista,³ Prawesh Neupane³

¹Department of Obstetrics and Gynaecology, Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu, Nepal, ²Department of Pathology, Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu, Nepal, ³Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu, Nepal.

ABSTRACT

Introduction: Early pregnancy failure accounts for approximately 10% of all recognized pregnancies. Histopathological evaluation of tissue following early pregnancy failure is critical to rule out gestational trophoblastic disease, which requires special attention. Despite its importance, the utility of routine histopathological examination remains debatable. The aim of this study was to assess the outcome of histopathological analysis of tissue following early pregnancy failure and its diagnostic value.

Methods: A descriptive cross-sectional study was conducted at a tertiary care centre from 1 April 2024 to 30 September 2024 after obtaining the ethical approval from Institutional Review Committee (Reference number: 25032024/01). The study included 62 women diagnosed with early pregnancy failure before 13 completed weeks of gestation, confirmed either clinically or by ultrasonography. Surgical evacuation was performed, and obtained tissue was sent for histopathological examination. Data were analyzed using IBM SPSS version 25. Binary data were expressed as n (%) and continuous data in the form of Mean±SD.

Results: The mean age of participants was 29.87±6.49 years, with most 30 (48.38%) aged 21-30 years. Early pregnancy failure was most common between 6–9 weeks of gestation 29 (46.77%). Incomplete abortion was the most prevalent ultrasonographic diagnosis 38 (61.29%), followed by missed abortion (33.87%). Histopathological findings confirmed the presence of products of conception in 57 (91.93%) of cases, while 3.22% were diagnosed with partial molar pregnancy.

Conclusions: The study highlights the significance of routine histopathological evaluation of tissue following early pregnancy failure.

INTRODUCTION

Approximately 70% of recognized pregnancies occurs prior 13 completed weeks of gestation.^{1,2} Spontaneous miscarriages, once managed with surgical evacuation, are now treated on an outpatient basis using advanced diagnostics and therapies.³ However, the necessity of histopathological examination of early pregnancy loss tissues is a subject of ongoing debate, with some viewing it as unnecessary and others emphasizing its significance.⁴

Research has demonstrated that these examinations

Correspondence:

Dr. Swati Gupta
Department of Obstetrics and Gynaecology, Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu, Nepal
Email: sg37646@gmail.com
Phone: +977-9841558400.

can uncover a range of morphological changes in the chorionic villi and decidua, with prevalent being more in spontaneous abortion.⁵ It helps to confirm intrauterine fetal tissue, identify causes of recurrent pregnancy loss, or detect gestational trophoblastic diseases.^{3,6,7} Despite its potential value, the utility of routine histopathological examination remains limited, highlighting the need for standardized terminology and reporting practices.⁸

The aim of this study was to assess the outcome of histopathological analysis of tissue following early pregnancy failure and its diagnostic value.

METHODS

This cross-sectional study was conducted at the Department of Obstetrics and Gynecology of Kathmandu Medical College Public Limited. Data collection was done from 1 April 2024 to 30 September 2024 after obtaining

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the ethical approval from Institutional Review Committee of Kathmandu Medical College (Reference number: 25032024/01). Patients presenting with a confirmed diagnosis of early pregnancy failure clinically or by ultrasonography before 13 completed weeks of gestation and undergoing surgical evacuation were included in the study with their consent. Cases of medical termination of pregnancy were excluded. Whole sampling method was used.

Demographic variables including clinical data such as age, parity and gestational age were collected. Surgical evacuation was done and the samples obtained were placed in 10% formaldehyde and sent for histology as per hospital protocol. Data was collected with the help of a proforma and recorded in Microsoft Excel. The data was checked for completeness and analyzed using IBM SPSS Statistics for Windows, version 25.6. Binary data were expressed as n (%) and continuous data in the form of Mean±SD and median.

RESULTS

A total of 62 women who underwent surgical evacuation with subsequent histopathological examination were included during the study period. The mean age of women was 29.87±6.49 years (Median:30, IQR:10) ranging from 19 to 42 years. The age distribution showed that nearly half of the patients 30 (48.38%) were between 21 and 30 years. Majority, 44 (70.96%) were multigravida, with primigravida accounting for the remaining 18 (29.03%). Gestational age analysis revealed that the majority of cases 29 (46.77%) were diagnosed between 6–9 weeks. Ultrasonographic diagnosis indicated that incomplete abortion was the most prevalent finding, observed in 38 (61.29%) of cases, followed by missed abortion 21 (33.87%) (Table 1).

Table 1. Demographic profile of patients with early pregnancy failure (n= 62).

Variable	n (%)
Age distribution	
Less than 20	5 (8.06)
21-30	30 (48.38)
31-40	25 (40.32)
More than 41	2 (3.22)
Parity	
Multigravida	44 (70.96)
Primigravida	18 (29.03)
Gestation age (in weeks)	
Less than 6	9 (14.51)
6 to 9	29 (46.77)

More than 9	24 (38.70)
Ultrasonographic diagnosis	
Incomplete abortion	38 (61.29)
Missed abortion	21 (33.87)
Molar	2 (3.22)
Blighted	1 (1.61)

Histopathological examination demonstrated that 57 (91.93%) of cases confirmed the presence of products of conception, while decidual tissue alone was observed in 3 (4.83%). Gestational trophoblastic disease (partial mole) was identified in 2 (3.22%) of cases (Table 2).

Table 2. Histopathological findings of patients with early pregnancy failure (n= 62).

Variable	n (%)
Product of conception	57 (91.93)
Decidual tissue only	3 (4.83)
Gestational Trophoblastic Disease (Partial mole)	2 (3.22)

DISCUSSION

Early pregnancy loss, defined as a nonviable intrauterine pregnancy within the first 13 weeks of gestation, is often referred to as miscarriage or spontaneous abortion.¹ Accurate diagnosis of miscarriage is essential to ensure proper management and to rule out other conditions like ectopic pregnancy or gestational trophoblastic disease which often requires special attention. The majority of miscarriages are sporadic and results from genetic causes greatly influenced by increasing maternal age.^{2,9}

Clinically recognized early pregnancy loss occurs in 9-17% of women aged 20-30 years, rising significantly to 20% at age 35, 40% at age 40, and 80% at age 45.⁹ The high proportion of patients aged 21-30 years in our study 30 (48.38%) could be attributed to the smaller sample size, which may not fully represent broader age distributions. However, this finding is consistent with the finding of Kayastha et al (64.61%) and Makaju et al. (62.20%).^{7,10} Similarly, the mean age of women in our study was 29.87±6.49 years, ranging from 19 to 42 years. This is consistent to the findings of Alsibiani et al., where the mean age was reported as 33.7±7.5 years (range: 14-48 years), and Tasci et al., who reported a mean age of 27 years (range: 17-45 years).^{3,11}

Ultrasound, quantitative beta-human chorionic gonadotropin (beta-hCG) testing, and histopathological examination of uterine tissue are key diagnostic tools. Based on ultrasonographic findings, the majority of early pregnancy loss in our study were classified as incomplete abortion, consistent with the findings of Kayastha, Shetty,

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and Rashid.^{4,7,12} In contrast, the study by Alsibiani found that both incomplete abortion and missed abortion accounted for 45.30% of early pregnancy loss cases. Traditionally, surgical uterine evacuation was the standard treatment for women experiencing spontaneous miscarriage. However, in recent years, outpatient management, along with advanced diagnostic techniques and therapeutic interventions, has become increasingly common.³ Histopathological examination of tissue from spontaneous miscarriage or uterine evacuation is commonly performed to aid in diagnosis and differentiation. While its routine use is debated, some experts recommend submitting all such tissues for analysis to rule out ectopic pregnancy, gestational trophoblastic diseases, or structural causes of miscarriage.

Products of conception were the most common finding in our study 57 (91.93%), followed by decidual tissue 3 (4.83%), and gestational trophoblastic disease (GTD) cases accounted for 2 (3.22%). Similar results were observed in other studies, where products of conception was the major finding in histopathological examinations.^{7,11-13} In contrast, Fram reported a relatively high incidence of GTD, with 17% cases of partial mole and 1% cases of complete mole.¹⁴ The wide range of GTD findings in the histological studies across these different studies is likely due to varying incidences of GTD in different regions of the world.⁷ While routine histological examination helps detect first-trimester molar pregnancies, the significance of a partial mole is debated, and it remains unclear whether women benefit from these histological results.³ Additionally, numerous pathologies like ectopic pregnancy, exaggerated placental site, placental site trophoblastic nodule, and decidual tissue have been reported in several studies.^{11,15} These studies have justified the histopathological analysis of tissue following early pregnancy loss.

In most centers, it is standard practice to send tissue obtained from uterine evacuation after miscarriages for histopathological examination, not only to confirm pregnancy but also for medico-legal purposes.^{3,4} Histological examination is an effective method for diagnosing pathological pregnancies. Novac and his team recommended submitting all specimens for histological examination to identify potential dysmorphic or disruptive causes, exclude GTD, and confirm pregnancy by detecting fetal or placental tissue.¹⁶ However, Heath et al. concluded that routine histological examination after miscarriage or termination may not consistently confirm diagnoses or ensure complete evacuation, emphasizing the importance of thorough training for obstetricians, with histology reserved for cases with uncertain diagnoses or suspected pathology.⁶

Although some studies have reported low molar and ectopic pregnancies findings, the Royal College of Obstetricians and Gynaecology (RCOG) recommends histological examination of tissue obtained during uterine evacuation in miscarriage cases due to the maternal risks posed by undiagnosed ectopic or molar pregnancies.¹⁷ Similarly, while only two cases of GTD were observed in our study, the high incidence of gestational trophoblastic disease in our region may affect the significance of routine histopathological examination of the obtained tissues.³ Our protocol aligns with the recommendations of Tasci, Fram and Novak et al., who emphasized that all specimens should undergo histologic examination to rule out trophoblastic diseases or confirm the presence of intrauterine fetal or placental tissues in cases of surgical evacuation due to miscarriage.^{11,14,16} This study demonstrates that routine histopathological assessment of first-trimester spontaneous miscarriages can help diagnose important conditions like molar pregnancy and placental trophoblastic disease.

The study has several limitations, including a short six month study period, which may not capture population variations in early pregnancy failure, and a relatively small sample size of 62 participants, limiting the generalizability of the findings. The study's single-centre design may not reflect the demographic and clinical diversity of other regions. Additionally, it lacked extensive analysis of potential confounding factors such as genetic predispositions, maternal comorbidities, or lifestyle influences. Furthermore, while the study relied on histopathological analysis as the gold standard, it did not address interobserver variability or potential diagnostic errors in interpretation.

However, it addresses an important clinical question by emphasizing the significance of routine histopathological examination in cases of early pregnancy failure, which aids in diagnosing conditions such as GTD and preventing severe complications like choriocarcinoma. The use of a standardized data collection and analysis protocol, including ultrasonographic correlation and histopathological evaluation, ensures the reliability of the findings. The study highlights the prevalence of key conditions such as molar pregnancy in a specific population, contributing valuable region-specific data. Additionally, the study's focus on integrating demographic and clinical characteristics, such as age, parity, and gestational age, provides a comprehensive overview of early pregnancy failure patterns. By utilizing total sampling and descriptive statistics, the research establishes a solid foundation for future investigations into this topic.

CONCLUSIONS

The histopathological findings found in our study were similar to similar studies done in similar settings. The incidence of molar pregnancy, 2 (3.22%) found among early pregnancy failures in our study similar to some other studies underscores the importance

of histopathological examination for early detection, prompt intervention, and close monitoring to prevent choriocarcinoma. Therefore, we recommend routine histopathological analysis in cases of early pregnancy failure.

Conflict of Interest: None.

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