

Histopathological Analysis of the Product of Conception Following First Trimester Abortion; Is There a Diagnostic Value?

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ABSTRACT

Introduction: Abortion is one of the most common problems faced by women of reproductive age group in Nepal. The most common complication associated with abortion is Retained Product of Conception. Histopathology is the confirmatory diagnostic test for the confirmation of intrauterine pregnancy and associated gestational trophoblastic neoplasm. **Aims:** To evaluate the value of histopathological examination of products of conception in first trimester abortion. **Methods:** A hospital based descriptive cross sectional study conducted from June 2021 to May 2023, among the women admitted with diagnosis of first trimester abortion at Lumbini Medical College and Teaching Hospital. **Results:** Among 89 cases of abortions, incomplete abortion was the commonest type constituting 83.1% of the studied group. The majority of participants belonged to age group of 21-30 years (49.4%) with a mean age of 28.64±12.7 years. Histopathologic examination confirmed products of conception in 54 (60%) patients, partial molar pregnancy in 7 (7.86%) patients, decidual reaction in 4 (4.49%) patients, complete mole in 1 (1.12%) patient and hydropic abortus in 12 (13.48%) patients. **Conclusion:** The histopathological examination of the products of conception proved to be an important tool in confirming intrauterine pregnancy and to find out possible pathologies associated with product of uterine evacuation like molar pregnancy and hydropic changes that necessitate special follow-up and further management.

Keywords: Abortion, Histopathology, Hydropic changes, Molar pregnancy

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INTRODUCTION

According to the World Health Organization (WHO), spontaneous abortion refers to the expulsion or extraction of a fetus or embryo weighing 500 g or less from its mother before the fetus has reached a viable gestational age.¹ It is the most common complication of pregnancy and more than 80% of spontaneous abortion occurs in the first 12 weeks.² The abortion can be classified as spontaneous and induced, moreover, spontaneous abortion can further be classified as threatened, inevitable, complete, incomplete, missed, and septic abortion.³ The pathology of spontaneous abortions is therefore an important aspect necessary for understanding the etiology and pathogenesis of the abortion.⁴ The most common problems associated with bleeding in first-trimester pregnancy are abortion, ectopic pregnancy, and molar pregnancies.⁵ These conditions are not clinically differentiated if conceptus tissue is not sent for histopathological examination (HPE).

If the molar pregnancies are missed, this would lead to prolonged follow-up and serious implications on maternal health. The main reasons for doing a routine histopathological examination for the product of conception are: to prove the presence of an intrauterine gestation and to exclude undiagnosed gestational trophoblastic disease in the form of partial or complete hydatidiform mole.⁶ In addition, it is often hoped especially in the clinical setting of recurrent spontaneous miscarriage, that further diagnostic information explaining the underlying cause of the pregnancy loss may be obtained from such examination.⁷ This study aimed to assess the role of histopathology in cases of first trimester miscarriages and to determine clinical relevance of histopathological examination following surgical evacuation.⁵

METHODS

This was a retrospective study done in Lumbini Medical

College and Teaching Hospital. Total 89 cases collected from purposive sampling with the diagnosis of first-trimester abortion from June 2021 to May 2022, were included. The products of conception were received in 10% formalin at the Department of Pathology. After the gross examination of the specimen, tissue processing was done using an automatic tissue processor. Specimens were processed and embedded in paraffin wax. The sections of 3-5 micrometer thickness were obtained and stained with Haematoxylin & Eosin. All slides were examined and interpreted by a team of authors.

Inclusion criteria

Female patients of child bearing age 15 to 50 years with a history of incomplete abortion who underwent uterine evacuation in the first trimester.

Exclusion criteria

Improperly fixed specimens and ectopic pregnancy products.

Statistical analysis

Data was analyzed using Microsoft excel and IBM SPSS statistics software 30.0. Data was collected and presented as frequency and percentages tables. Mean and standard deviation was calculated as per the requirement.

RESULTS

Age group distribution

The patient age in the study ranges from 15-50 years with a mean age of (28.64 ± 12.7). The age group 20-30 years was the most frequently affected 44 (49.4%) followed by the age group of 30- 40 years 29 (32.6%). The age group of 40-50 years was least affected 5 (5.6%) followed by the age group of 15 to 20 years which were 11 (12.4%) (Table I).

| Maternal age | Frequency | Percentage (%) |
|--------------|---------------|----------------|
| 15 to 20 yrs | 11 | 12.4% |
| 20-30 years | 44 | 49.4% |
| 30-40 years | 29 | 32.6% |
| 40-50 years | 5 | 5.6% |
| Total | 89 | |
| Minimum age | 15 | |
| Maximum Age | 46 | |
| Mean ±SD | 28.64 ± 12.7% | |

Table I: Distribution of cases as per age

Period of Gestation

In the present study, uterine evacuation was performed for different periods of gestation, mean period of gestation was found to be 8.8 with ±1.72 standard deviation. It was found that 34 (38.2%) abortions had occurred between periods of 8 to 10 weeks of gestation whereas the least cases 4 (4.49%) observed during the period less than 6 weeks. (Table II)

| Period of Gestation | Frequency | Percentage |
|---------------------|-----------|------------|
| Less than 6 weeks | 4 | 4.49% |
| 6 to 8 weeks | 25 | 28.09% |
| 8 to 10 weeks | 34 | 38.20% |
| 10 -12 weeks | 26 | 29.21% |
| Total | 89 | |
| Mean ±SD | 8.8 ±1.72 | |

Table II: Distribution as per period of gestation

Types of termination

In the present study, pregnancy termination was done by various methods. It was found that 81 (91.01 %) of patients had surgical termination. Failed medical termination was recorded to be 8 (8.99%).

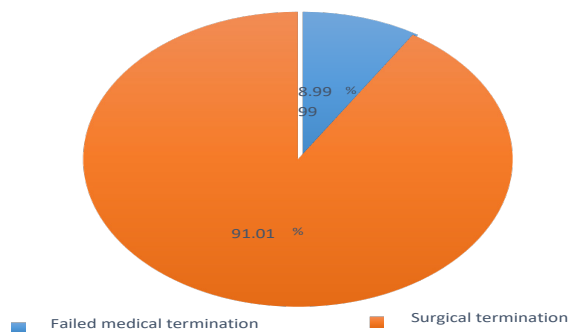


Figure 1: Distribution of cases as per termination

Gross Appearance of products of conception

The present study revealed that blood clots with villi 83 (93.26%) followed by the least number of blood clot with vesicle 6 (6.747%). Fetal parts were not identified in any cases (Figure 2).



Illustration 1: Decidualised tissue with blood clots and vesicles

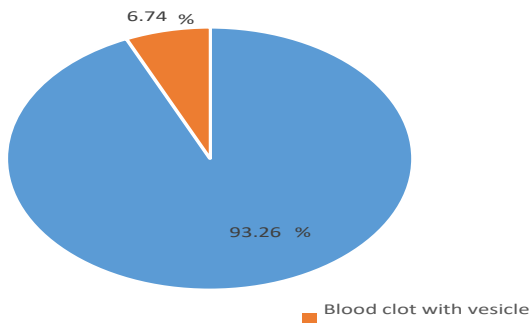


Figure 2: Distribution of cases as per gross appearance of POC

Microscopic finding

All 89 cases were evaluated by visualization under the microscope and 10 cases were found to have absent villi so, 79 cases of villi were studied as below:

Morphological features in villi

Out of 79 villi cases studied separately for other morphological features, 66 (83.5%) hemorrhages were found followed by hydropic changes in villi 37 (46.83%), perivillous fibrin deposition in 72.15%, and the least was cistern formation in 4 (4.49%). (Table III).

| Other morphological features in villi | Frequency | Percentage |
|---------------------------------------|-----------|------------|
| Hemorrhages | 66 | 83.5% |
| Perivillous fibrin deposition | 57 | 72.15% |
| Hydropic changes | 37 | 46.83% |
| Cistern formation | 4 | 4.49% |

Table III: Distribution of cases as per other morphological features in villi

Histopathological changes in decidua

While analyzing the histopathological changes in 89 cases separately. Inflammation, fibrin deposition, and hemorrhages were found to be in 41 (46%), 31 (34.8%) cases, and 29 (32.5%) respectively whereas necrosis was found to be in 14 (15.7%) cases least in the study.

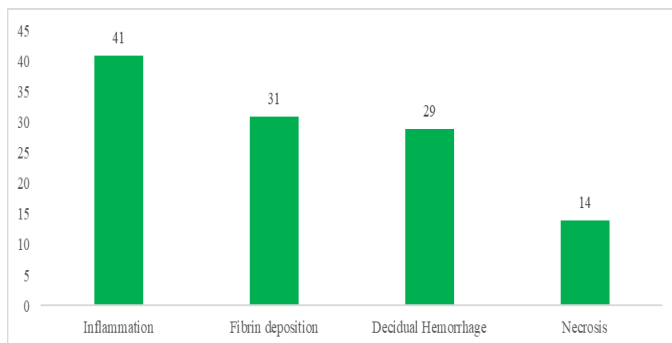


Figure 3: Distribution of cases showing the histopathological changes in decidua

Histopathological Diagnosis

Out of 89 cases, the majority 54 (60.67%) specimens showed features consistent with the product of conception, 12 (13.48%) cases had features of hydropic abortus, 8 (8.98%) cases had partial mole, 7 (7.86%) cases had endometritis, 4 (4.49%) cases had a decidual reaction and 1 (1.12%) cases showed features with complete mole. There were 3 (3.37%) cases only with blood clot.

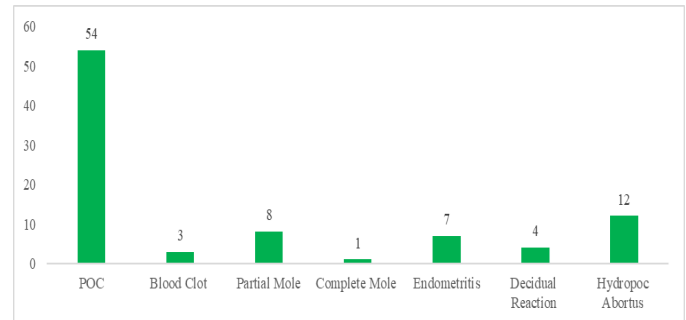


Figure 4: Distribution of cases as per histopathological diagnosis

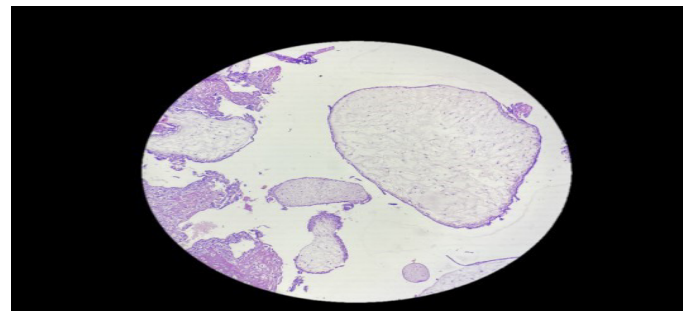


Illustration 2: Hydropic Villi

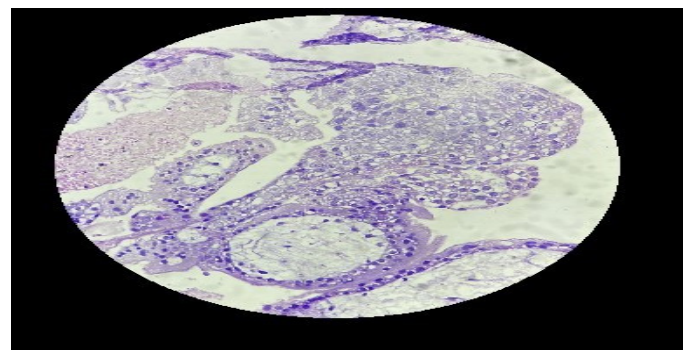


Illustration 3: Trophoblastic Proliferation

DISCUSSION

The products of conception which are passed during abortion following uterine evacuation should be subjected to HPE to confirm the intrauterine pregnancy and to diagnose the gestational trophoblastic disease that requires immediate

treatment or long-term follow-up.⁸

In the present retrospective study of duration 12 months. It was found that the mean age at the time of abortion was 28.64 years with a standard deviation of ± 12.7 . The minimum age was 15 years and the maximum 50 years. The majority of women belong to the age group 21-30 years 49.4% while only 5.6% were 41-50 years which is concordant with Makaju et al, Heena Iqbal et al, Vidhyasagar et al, Thirkumar M et al.^{1,9-11} In the present study, the majority of patients (83.1%) were admitted with a diagnosis of incomplete abortion. This is in agreement with a study conducted by Lama et al, Rashid et al and Thapa et al, which also revealed incomplete abortion in the majority.^{2, 7, 12}

Similarly, the study also revealed that villous hydropic changes were of 46.83%, hemorrhages at 83.5%, perivillous fibrin deposition at 72.15%, and cistern formation at 4.49% were identified which in contrast to the study of Shilpa et al.²

Moreover, the study revealed that inflammation and fibrin deposition in decidua are the major findings comprising 41.4% and 29.7% respectively which is similar to the study done by Makaju et al and Sarin et al^{1, 13} which showed inflammation in 41.1% and fibrin deposition in 75% cases respectively. Our study revealed 46% of haemorrhages and 34% of fibrin in decidua. A study done by Fram K et al¹⁴ states that the majority of cases (91%) went surgical evacuation for the termination of pregnancy which is concordant with the present study where 81 (91%) went surgical evacuation.

In the study conducted by Vidhyasagar et al, histopathological examination of specimens was performed in 190 cases.⁹ Majority of these (123 - 64.74%) specimens showed features consistent with products of conception, 9(4.74%) cases had features of infected products of conception, 12(6.32%) cases had features of decidua, 13(6.84%) cases had features of infected decidua and 8(4.2%) cases showed features of decidua with endometrial glands. There were 23(12.1%) specimens which did not show any feature related to pregnancy. In contrast to that study, current study reveals the product of conception, 12(13.48%) cases had features of hydropic abortus, 8(8.98%) had partial mole, 7(7.86%) cases had endometritis, 4(4.49%) cases had decidual reaction and 1(1.12%) cases showed features with complete mole and 3(3.37%) cases were found to have blood clot.

Tasci et al found that uterine evacuation was performed in cases of incomplete miscarriage (n = 970, 60.4%), missed miscarriage (n = 406, 25.2%) and anembryonic miscarriage (n = 230, 14.3%). Histopathologic examination revealed the product of conception in 1,119 patients (69.7%) while partial hydatidiform mole was diagnosed in 33 patients (2.1%). The complete hydatidiform mole was detected in only seven cases (0.43%). Exaggerated placental site and placental site trophoblastic nodule was detected in two cases (0.12%). Decidual tissue without chorionic villi was reported in 272 patients (16.9%) raising the suspicion of the presence of other pathology.¹⁵

A study done by Nogueira et al stated that grossly, first-trimes-

ter specimens consisted of blood clots admixed with minimal decidua and fragmented villous tissue.¹⁶ In the present study on gross examination, blood clot with villi was seen in 93.25% and blood clot with vesicle 6.74%. Ernst et al however, support the idea that careful pathologic examination of Dilution and Evacuation specimens can identify significant fetal and placental changes that can confirm clinical diagnoses, provide a conclusive diagnosis from clinical differential diagnostic lists, help explain the cause of IUFD, and identify unexpected anomalies that may provide additional clues to a diagnostic syndrome or mechanism of anomaly formation. Since family planning, genetic counseling, and bereavement treatment may all be affected, proper study of D&E specimens may have an impact on therapeutic care.¹⁷

The histological report of the 1, 576 women studied by Heath et al confirmed that 1,465 (93%) of the women had obtained the products of conception; in two other women (0.13%), molar changes were reported, supporting the ultrasound preoperative diagnosis. In 0.5% of medical terminations, 5% of surgical terminations, 10% of evacuations following an earlier evacuation, 12% of evacuations for a failed pregnancy and 19% of evacuations for an incomplete miscarriage, the products of conception were not confirmed in the tissue specimens. Decidua was recorded in 87 women (6%), two of whom had undergone evacuation for an ultrasound diagnosis of spontaneous miscarriage; nevertheless, in both cases, a tubal ectopic pregnancy was later discovered.⁸

Alsibiani et al evaluated the medical records of all 558 patients with a diagnosis of first-trimester miscarriage. A histopathologic examination revealed fetal products in 537 (96.2%) of the patients, no fetal products in 17(3%) of the patients, molar pregnancy in 2(0.4%) of the patients, and decidual tissues devoid of chorionic villi (Arias-Stella reaction) in 2(0.4%) of the patients. Only one unsuspected partial molar pregnancy was identified after clinical correlation by histopathology testing.¹⁸

Diagnoses for villitis and trophoblastic proliferative illness, according to Novak et al can only be determined through histologic examination. Histology or histology-based diagnostic approaches may become more crucial if more non-chromosomal causes of recurrent abortion are identified.¹⁹

LIMITATIONS

This study is based only on patients admitted to Lumbini Medical College Teaching Hospital with limited time frame and small sample size and cytogenetic studies are not carried out due to lack of ability and patient cooperation. The diagnosis was based solely on histopathological examination.

CONCLUSION

This study provides insight into detection of gestational trophoblastic neoplasm in suspected molar pregnancy and for the detection of non-molar hydropic abortus. Therefore, we conclude that histopathology examination of any available POC following first trimester abortion is mandatory, which is

crucial in predicting future chances of abortion and transformation into other gestational trophoblastic neoplasm.

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