

## Original Research Article

# UNVEILING HISTOPATHOLOGICAL FINDINGS ASSOCIATED WITH TUBAL ECTOPIC PREGNANCY: A COMBINED CLINICAL AND HISTOPATHOLOGICAL APPROACH

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### ABSTRACT

**Background:** Ectopic pregnancy, defined as the implantation of a blastocyst outside the endometrial lining of the uterus, is a significant global contributor to maternal mortality during the first trimester. Histopathological examination of ectopic pregnancy specimens plays a crucial role in both diagnosis and the identification of underlying factors that predispose a woman to this condition. While fallopian tube implantation accounts for over 95% of ectopic pregnancies, the etiology is likely multifactorial, with numerous risk factors potentially contributing. This study investigates the risk factors associated with ectopic pregnancy within our specific population, with a particular focus on the potential association between ectopic pregnancy, chronic salpingitis, and salpingitis isthmica nodosa.

**Material and Methods:** This study retrospectively analysed 50 surgically resected fallopian tube specimens obtained over a two-year period. The specimens encompassed patients of all age groups. Routine histopathological techniques were employed for processing, with detailed examination of Hematoxylin and Eosin stained slides. Additionally, a comprehensive review of patient medical records was conducted to extract detailed clinical history and assess potential risk factors.

**Results:** The present study included a total of 50 cases confirmed through histopathological analysis. Chronic salpingitis emerged as the most frequently identified histopathological finding. Furthermore, analysis of patient medical history revealed that a prior history of tubal sterilization and pelvic inflammatory disease (PID) were the most prevalent risk factors.

**Conclusion:** In conclusion, the present study demonstrates that chronic salpingitis is the most frequently encountered histopathological finding in patients with tubal ectopic pregnancy. This observation is further strengthened by the association identified between chronic salpingitis and a prior clinical diagnosis of pelvic inflammatory disease (PID).

**Keywords:** Ectopic Pregnancy, Tubal gestation, Chronic Salpingitis, Salpingitis Isthimica Nodosa, Pelvic Inflammatory Disease.

## INTRODUCTION

The term "ectopic pregnancy" originates from the Greek word "ektos," signifying "out of place."<sup>[1]</sup> This condition arises when a fertilized ovum

implants at an abnormal location outside the uterine cavity, referred to as ectopic gestation.<sup>[2]</sup> Ectopic pregnancy represents a significant cause of mortality during the first trimester and necessitates emergency laparotomy in many cases.<sup>[1,3]</sup> Diagnosis can be

challenging due to the overlap in presentation with other conditions that may not require surgical intervention.<sup>[3]</sup> Common clinical indicators of ectopic pregnancy include vaginal bleeding, acute lower abdominal pain, pelvic pain, cervical tenderness, and the presence of an adnexal mass.<sup>[4]</sup> Classification of ectopic pregnancies occurs based on the implantation site of the fertilized egg. The most frequent location, accounting for over 95% of cases, is the fallopian tube (tubal pregnancy). Other less common sites include the interstitial portion of the uterus (interstitial pregnancy), the cervix (cervical pregnancy), and the ovary (ovarian pregnancy).<sup>[5]</sup> Several factors contribute to the development of ectopic pregnancy. These include pelvic inflammatory disease (PID), prior surgeries in the pelvic or tubal regions, misuse of contraceptive devices or oral contraceptive pills, a history of prior abortion, chronic smoking, and a personal history of ectopic pregnancy. Chronic salpingitis, a condition characterized by chronic inflammation of the fallopian tubes, is frequently implicated in ectopic pregnancy. It is thought to cause inflammatory destruction of the lining folds within the fallopian tubes, potentially leading to the retention of a fertilized ovum and subsequent ectopic implantation.<sup>[6]</sup>

The present study aimed to investigate the spectrum of histomorphological alterations within fallopian tubes surgically resected following ectopic tubal pregnancy. Additionally, a comprehensive review of patient medical records was undertaken to identify potential risk factors associated with the etiology of ectopic pregnancy in this specific patient population.

## MATERIAL AND METHODS

This investigation was designed as a descriptive study conducted within the Department of Pathology at SGT Hospital, Gurugram, India. The study encompassed a two-year period, extending from January 2022 to December 2023.

### Inclusion Criteria

Only cases definitively diagnosed with ectopic tubal pregnancy through histopathological examination were incorporated into the study.

### Exclusion Criteria

Specimens where histopathological identification of the fallopian tube was not possible were excluded from the analysis.

### Methodology

Fallopian tube specimens resected during surgical procedures for ectopic tubal pregnancies were fixated in 10% neutral buffered formalin. Following gross examination, representative tissue sections were processed, embedded in paraffin wax, and subsequently sectioned into tissue blocks. These sections were stained using Hematoxylin and Eosin (H&E) and then examined under a light microscope. Detailed observations were documented and

correlated with the patients' clinical histories before being categorized.

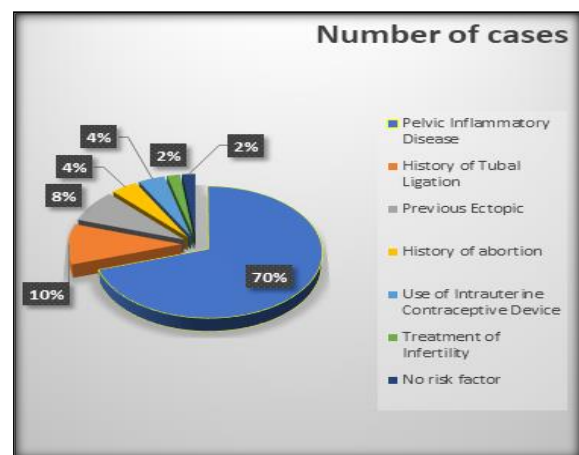
## RESULTS

A total of 50 cases of ectopic tubal pregnancy were identified within the study cohort. The maternal ages of the patients ranged from 18 to 40 years. Notably, the age group of 25-30 years exhibited the highest prevalence within the study population. [Table 1]

It was also observed that maximum number of ectopic pregnancies were among primigravida.

Analysis of the 50 cases revealed a right-sided location for 33 ectopic pregnancies (66%), with the remaining 17 (34%) located on the left side. The ampullary region of the fallopian tube emerged as the most prevalent site of ectopic implantation, accounting for 85% of cases. The isthmic region was identified in the remaining 15% of cases. Notably, ectopic implantation within other regions of the fallopian tube was not observed within the study population.

An evaluation of potential risk factors associated with ectopic pregnancy was conducted. Pelvic inflammatory disease (PID) emerged as the most prevalent risk factor within the study population, followed by a history of tubal ligation, prior ectopic pregnancy, history of abortion, intrauterine contraceptive device (IUD) use, and infertility treatments. [Table 2]



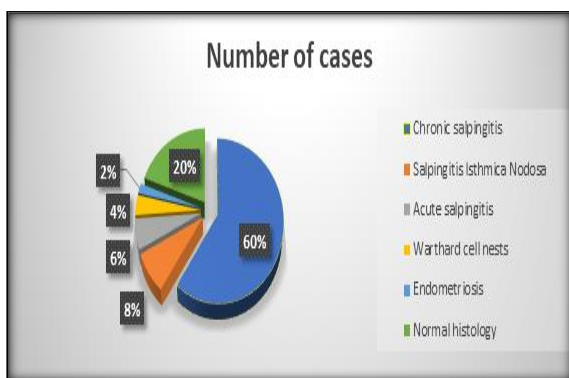
**Figure 1:** Distribution of cases as per according to risk factors involved

## HISTOPATHOLOGICAL FINDINGS

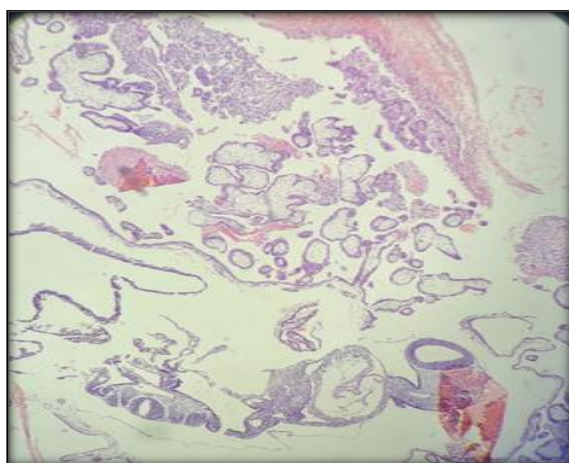
Microscopic examination definitively confirmed the presence of ectopic tubal pregnancy in all sections analyzed. This confirmation was based on the identification of chorionic villi or trophoblastic tissue within the fallopian tube. Notably, several conditions, such as hematosalpinx and ruptured haemorrhagic corpus luteum, can mimic the clinical presentation of ectopic pregnancy. Therefore, histopathological evaluation plays a crucial role in differentiating these entities. Representative

microscopic sections were further assessed for additional alterations within the adjacent fallopian tube tissue. This evaluation aimed to identify potential factors that could contribute to the development of ectopic pregnancy.

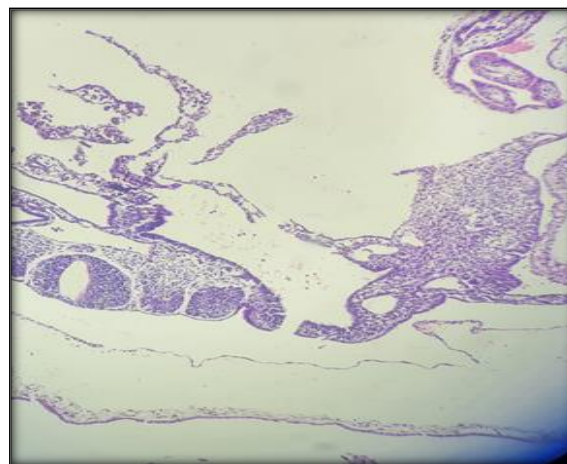
- Chronic Salpingitis: The presence of chronic inflammatory cells in the lamina propria, coupled with thickening of the rugae and blunting of the plicae, suggested the possibility of chronic salpingitis.
- Salpingitis Isthmica Nodosa: Ectopic epithelium identified within the myosalpinx or beneath the tubal serosa raised the possibility of salpingitis isthmica nodosa as a potential risk factor.
- Endometriosis: In cases of tubal endometriosis, endometrial glands and stroma were observed within the fallopian tube tissue.
- Acute Salpingitis: Dense infiltration of acute inflammatory cells, along with mucosal edema and exudation, indicated the presence of acute salpingitis.
- Walthard Cell Nests: The presence of transitional cell nests within the serosal surface of the fallopian tube was also noted.



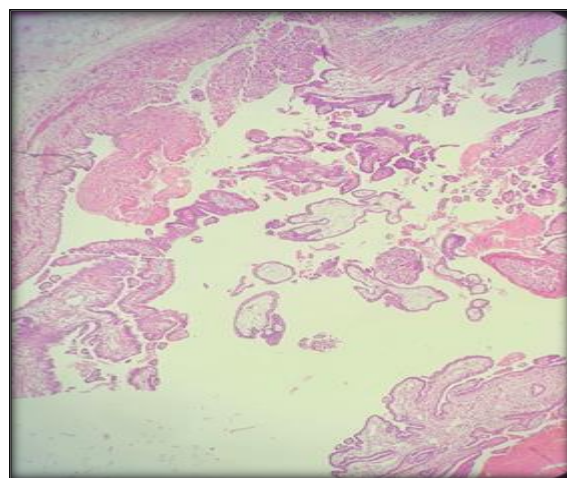
**Figure 2 - Distribution of cases as per additional histopathological findings**



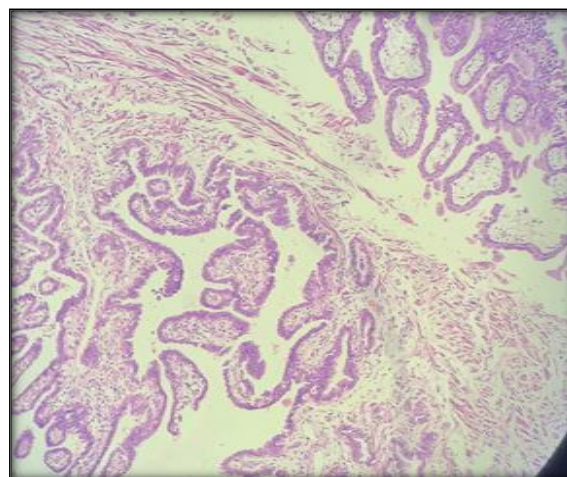
**Figure 3A**



**Figure 3B**

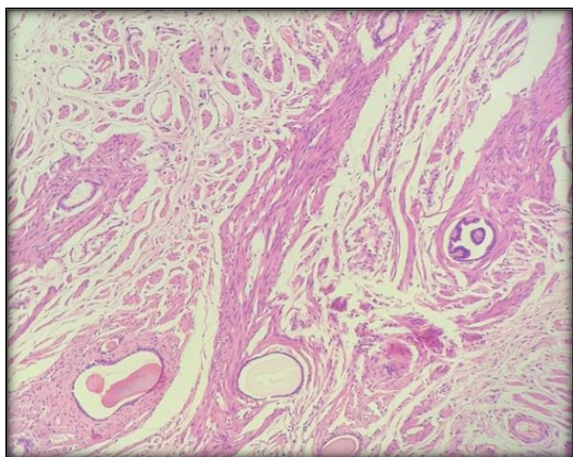


**Figure 3C**

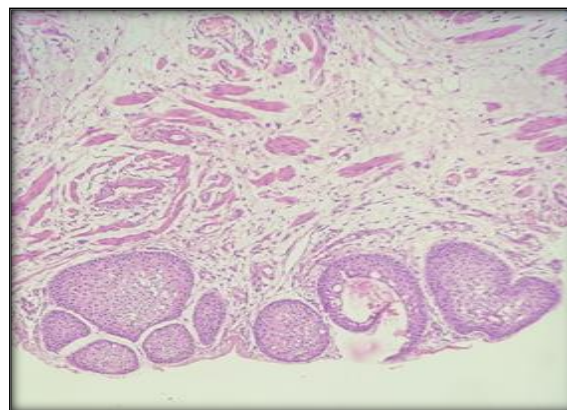


**Figure 3D**

**Figure 3: H & E-stained sections of tissue from a case of ectopic tubal pregnancy with fetal parts and inflammatory cells**  
**A (scanner view) & B (100X view) - Intraluminal chorionic villi & histological features of growing embryo.**  
**C (100X view) & D (400X view) - Fallopian tube with intraluminal chorionic villi and presence of inflammatory cells**

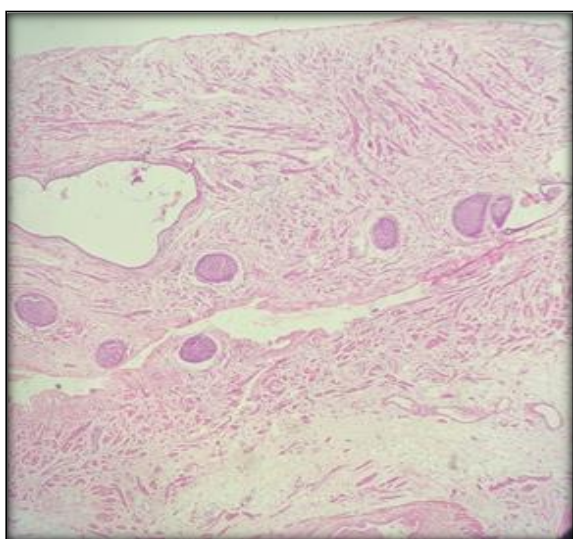


**Figure 4:** On 100 X -H & E-stained section from a case of tubal ectopic pregnancy showing endosalpingiosis



**Figure 5B**

**Figure 5:** A (on scanner) & B (on 100X)- H & E-stained sections of adjacent fallopian tube from a case of ectopic tubal pregnancy show multiple Walthard cell nests



**Figure 5A**

**Table 1: Distribution of cases as per maternal age**

Maternal age group (in Years of age)	Number of cases in each age group
18-24	13 (26%)
25-30	20 (40%)
31-35	10 (20%)
36-40	07 (14%)

**Table 2: Distribution of cases as per parity**

Parity	Number of cases in each group
Nulliparous	06 (12%)
Primipara	31 (62%)
Multipara	13 (26%)

**Table 3: Distribution of cases as per according to risk factors involved**

Risk Factors	Number of cases
Pelvic Inflammatory Disease	35 (70%)
History of Tubal Ligations	05 (10%)
Previous Ectopic	04 (08%)
History of abortion	02 (04%)
Use of Intrauterine Contraceptive Device	02 (04%)
Treatment of Infertility	01 (02%)
No risk factor	01 (02%)

**Table 4: Distribution of cases as per additional histopathological findings**

Additional Histopathological findings	Number of cases
Chronic salpingitis only	30 (60%)
Salpingitis Isthmica Nodosa only	04 (08%)

Acute salpingitis only	03 (06%)
Walthard cell nests	02 (04%)
Endometriosis with endosalpingiosis	01 (02%)
Normal histology	10(20%)

## DISCUSSION

The current study identified the age group of 25-30 years as the most commonly affected demographic which is similar to the findings of the study conducted by Sindhura M et al.<sup>[7]</sup> This finding is in contrast with study by Hoover KW et al which suggests that risk of ectopic pregnancy rises with increased maternal age.<sup>[8]</sup>

Right-sided ectopic tubal pregnancies were observed more frequently, with the ampulla being the predominant implantation site which was similar to the study conducted by Gorva A et al.<sup>[9]</sup>

A majority of the patients presented as primigravidae within the 7-8 week gestational window. These findings are consistent with observations reported in the majority of relevant English literature.

An analysis of potential risk factors revealed pelvic inflammatory disease (PID) as the most prevalent, followed by a history of tubal ligation, prior ectopic pregnancy, history of abortion, intrauterine contraceptive device (IUD) use, and infertility treatments. While various studies within the literature present differing observations, some key findings are noteworthy. For instance, the study by KP et al. identified PID as the most common risk factor, followed by factors such as prior cesarean section (LSCS), previous pelvic surgery, history of abortion, tubal ligation, infertility treatment, dilation and curettage (D&C), prior ectopic pregnancy, and IUD use. Similarly, Medha Pradeep Kulkarni et al. reported an association between tubal pregnancy and PID, PID with tubal ligation, tubal ligation itself, prior LSCS, and infertility treatments. Rasheed F. et al. documented a prevalence of risk factors with history of tubal sterilization being the most common, followed by previous abdominal surgery, prior abortion, IUD use, infertility, pelvic inflammatory disease, and prior ectopic pregnancy. Wakankar R et al found previous surgeries in abdomino-pelvic region and any previous abortion or medical termination of pregnancy to be the most common risk factor associated with ectopic pregnancy.<sup>[1,2,6,10]</sup>

An evaluation of representative sections from the adjacent fallopian tube tissue was conducted to assess any potential co-existing pathologies. Chronic salpingitis emerged as the most prevalent finding within the study cohort, identified in 30 out of the 50 cases (60%). Salpingitis isthmica nodosa was observed in 4/50 cases (8%), followed by acute salpingitis in 3/50 cases (6%). Walthard cell nests and endometriosis were identified in 2/50 cases (4%) and 1/50 cases (2%), respectively. Notably,

normal tubal histology was observed in 10/50 cases (20%).

A review of the existing literature revealed some variation in the prevalence of these associated findings. Medha Pradeep Kulkarni et al. reported chronic salpingitis as the most common finding (56.30%),<sup>[11]</sup> followed by follicular salpingitis (9%) and mesothelial hyperplasia (9%). The remaining cases in their study exhibited normal histology. Similarly, Rasheed F. et al. documented a prevalence of chronic salpingitis in 48.1% of their cases.<sup>[6]</sup> The remaining cases comprised acute salpingitis (18.8%), salpingitis isthmica nodosa (8.1%), and endometriosis (0.6%). Finally, L Kutluay et al. reported findings consistent with our observations, with chronic salpingitis identified in 51.1% of cases, followed by chronic salpingitis with salpingitis isthmica nodosa (14.9%) and acute salpingitis (34.8%).<sup>[11]</sup>

An analysis of the present study revealed a noteworthy association between histological findings and specific risk factors. Notably, all patients diagnosed with pelvic inflammatory disease (PID) upon clinical evaluation were subsequently confirmed to have chronic salpingitis through histopathological examination. Furthermore, some patients with a history of tubal ligation were identified to have salpingitis isthmica nodosa on microscopic examination. These findings align with observations reported by Rasheed F. et al., who documented a similar association between PID and chronic salpingitis.<sup>[6]</sup>

In our study, only 4% of cases exhibited multiple number of Walthard cell nests. Notably, no other studies have reported a correlation between increased Walthard cell nests and ectopic pregnancy.

## CONCLUSION

In conclusion, the present study demonstrates that chronic salpingitis is the most frequently encountered histopathological finding in patients with tubal ectopic pregnancy. This observation is further strengthened by the association identified between chronic salpingitis and a prior clinical diagnosis of pelvic inflammatory disease (PID). These findings highlight the importance of meticulously examining the adjacent fallopian tube during surgical procedures for ectopic pregnancy. Such comprehensive evaluation can potentially contribute to the identification of clinical and histopathological risk factors associated with tubal ectopic pregnancy. Future investigations involving a larger patient cohort are required to further refine our understanding of this condition and facilitate earlier diagnosis.

## REFERENCES

1. Kulkarni MP, Sulhyan KR, Parab AJ. Clinicopathological study of Ectopic pregnancy. *JMSCR*. 2017;5(9):27731-36.
2. Athira, K. P., Umashankar, T., & Kumar, M. "Clinicopathological Study of Tubal Ectopic Gestation in a Tertiary Care Centre. *IJPCR*, 2022.
3. Govada N, Konkay K, Pola N, devi Chaganti P. Clinical and Histopathological Findings of Ectopic Pregnancy Cases-A Retrospective Study from a Tertiary Care Hospital, Andhra Pradesh, India.
4. Kumari N, Noor S, Kumar M. A Clinicopathological study of tubo-ovarian lesions and its corralations. *IJPCR*. 2022
5. Hayashi T, Sano K, Konishi I. Histopathological Findings of Ectopic Pregnancy in Contraceptive-Wearing Woman. *J Clin Med Res*. 2023 Jul;15(7):384-389. doi: 10.14740/jocmr4924. Epub 2023 Jul 12. PMID: 37575351; PMCID: PMC10416193.
6. Rasheed F, Vijayaraghavan L. A study on histopathological changes in ectopic tubal gestation.
7. Sindhura M, Sailatha R, Famida AM, Vijayalakshmi K, Sathiya S, Renuka S. Trends in ectopic pregnancy: a retrospective clinical study of 79 cases. *Int J Reprod Contracept Obstet Gynecol* 2017; 6:3009-13.
8. Hoover KW, Tao G, Kent CK. Trends in the diagnosis and treatment of ectopic pregnancy in the United States. *Obstet Gynecol*. 2010 Mar;115(3):495-502. doi: 10.1097/AOG.0b013e3181d0c328. PMID: 20177279.
9. Gorva A, Karre S, Veergandham S Histopathological Study of Ectopic Pregnancies – A Rare case of Bilateral Ectopic Pregnancy *IOSR-JDMS* 2015;14:42-45
10. Wakankar R, Kedar K. Ectopic Pregnancy-A Rising Trend. *Int J Sci Stud*. 2015;3(5):18-22.
11. Kutluay L, Vicdan K, Turan C, Batioğlu S, Oğuz S, Gökmen O. Tubal histopathology in ectopic pregnancies. *Eur J Obstet Gynecol Reprod Biol*. 1994 Nov;57(2):91-4. doi: 10.1016/0028-2243(94)90049-3. PMID: 7859911.