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Original Research Article

Clinico-histopathological Correlation in Ectopic Pregnancy: Insights from a Rural Tertiary Center in Maharashtra, India

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ABSTRACT

Background: Derived from the Greek word ektopus, meaning "out of place," ectopic pregnancy entails the implantation of conceptus in any site other than a normal uterine location.[1] It remains a formidable challenge in women's healthcare, posing risks to both maternal life [2] and future fertility with global incidence ranging from 1-2%,[3] with approximately 3.12 per 1000 pregnancies in India. This study endeavors to conduct a comprehensive analysis of ectopic pregnancy cases, underscoring the pivotal role of histopathological examination in not only confirming the diagnosis but also unraveling the underlying etiologies. By integrating clinical findings with pathology, we aim to improve diagnostic accuracy, enabling timely interventions, fertility preservation, and better patient outcomes.

Material and methods: A retrospective analysis was conducted on 120 cases of ectopic pregnancy diagnosed between January 2021 and January 2024 at the Department of Pathology, Swami Ramanand Teerth Rural Government Medical College, Ambajogai. Clinical data, including age, parity, gestational age, and risk factors, were collected. Histopathological specimens were processed and examined using Hematoxylin and Eosin (H&E) staining, with detailed observations recorded and analyzed.

Results: The incidence of ectopic pregnancy was 1.13% of all gynecological cases, with the majority (70.83%) of patients in the 21-30 years age group. Multigravidity was common, with 47.12% presenting during their second pregnancy. The fallopian tube was the most frequent implantation site (97.29%), and rupture occurred in 57.65% of cases. Histopathological findings included chronic salpingitis (56.48%), salpingitis isthmica nodosa (9.2%), and acute salpingitis (4.6%). Additionally, 16.66% of cases were classified as normal.

Conclusion: Histopathological examination is essential for the accurate diagnosis and management of ectopic pregnancies, particularly in atypical cases. The integration of clinical and pathological data enhances diagnostic precision, aids in identifying complications, and informs future fertility management. This study highlights the importance of clinicopathological correlation in ensuring optimal patient care and outcomes in ectopic pregnancy cases.

Keywords: Ectopic Pregnancy, Histopathology, Clinical Correlation

INTRODUCTION

Derived from the Greek word ektopus, meaning "out of place," ectopic pregnancy entails the implantation of conceptus in any site other than a normal uterine location.[1] It remains a formidable challenge in women's healthcare, posing risks to both maternal life[2] and future fertility with global incidence ranging from

1-2%,[3] with approximately 3.12 per 1000 pregnancies in India.[4] Clinical presentations vary, with ruptured cases presenting as acute abdomen, while unruptured cases often exhibit a triad of abdominal pain, vomiting, and amenorrhea.[5]

Ectopic pregnancy presents a significant risk for severe complications, particularly rupture, which can result in life-threatening hemorrhage, internal bleeding, and shock. The ensuing damage often compromises future fertility, increasing the likelihood of recurrent ectopic pregnancies.[6] This study endeavors to conduct a comprehensive analysis of ectopic pregnancy cases, underscoring the pivotal role of histopathological examination in not only confirming the diagnosis but also unraveling the underlying etiologies. By integrating clinical findings with pathology, we aim to improve diagnostic accuracy, enabling timely interventions, fertility preservation, and better patient outcomes.

MATERIAL AND METHODS

This retrospective study was conducted in the Department of Pathology at Swami Ramanand Teerth Rural Government Medical College, Ambajogai, over a three-year period from January 2021 to January 2024, following approval from the institutional ethics committee.

Inclusion and Exclusion Criteria: The study included all cases with a histopathological diagnosis of ectopic tubal gestation received during the study period. Cases involving uterine gestations, such as missed abortions, spontaneous abortions, retained products of conception, and those without consent, were excluded.

A total of 120 cases were analyzed. Demographic details, parity, associated risk factors, clinical presentation, and radiological findings were retrieved from the histopathology requisition forms. The received specimens were preserved in 10% buffered formalin, and a comprehensive gross examination was performed with findings duly recorded. Representative tissue sections were processed, embedded in paraffin, and sectioned into tissue blocks for microscopic evaluation. The sections were stained using Hematoxylin and Eosin (H&E) and meticulously examined under the microscope. Detailed observations were documented, and the results, following clinical correlation, were compiled and presented in tabular form as percentages.

RESULTS

Within the framework of a three-year retrospective study at the Pathology Department of SRTR GMC Ambajogai, 120 ectopic pregnancies were reported among a total of 10250 gynecological cases, constituting 1.13%.

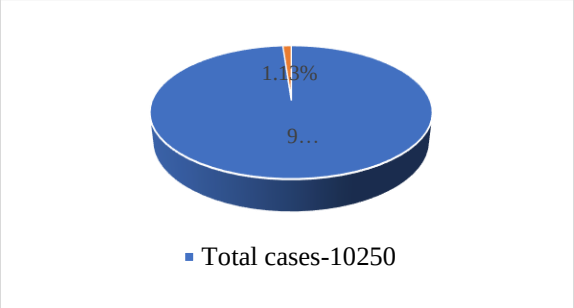
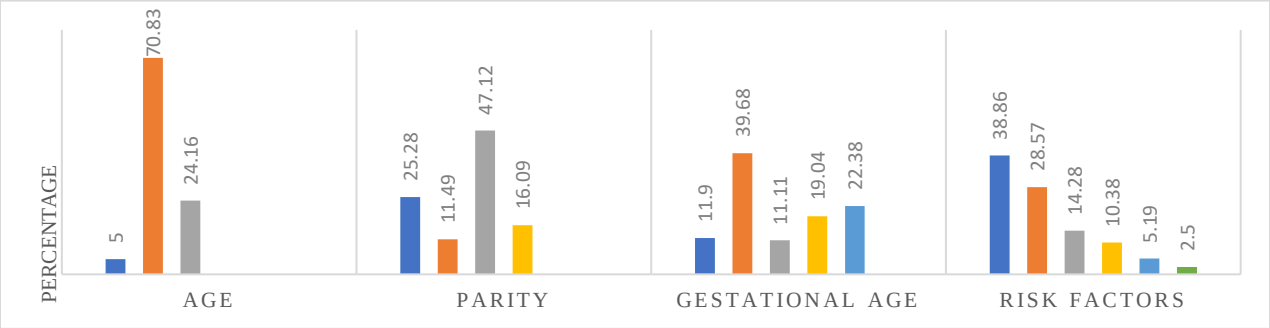


Figure-1: Ectopic pregnancy incidence

The study population of 120 cases predominantly consisted of young women in the age group of 21-30 years, with a mean age of 25 years. Parity information was known for 87 cases, revealing that a significant proportion were multigravida, with 47.12% presenting during their second pregnancy. Risk factor details were accessible for 77 cases, showing that a history of prior ectopic pregnancy or abortion was present in 48.05%, followed by previous lower segment cesarean sections (LSCS) at 8.96%. These findings highlight the importance of considering a patient's obstetric and gynecological history when evaluating suspected cases. Most diagnoses occurred at 6 weeks of gestation (39.68%), while a concerning 22.38% presented beyond 8 weeks, indicating a need for increased vigilance regarding delayed presentations.



Age (n=120)	Parity (n=87)	Gestational age(n=67)	Risk factors(n=77)
♦<=20 ♦21-30 ♦31- 40	♦0 ♦1 ♦2 ♦3&>3	♦5weeks ♦6weeks ♦7weeks ♦8weeks ♦>8weeks	♦Pelvic inflammatory disease ♦Abortion ♦Tubectomy ♦ Previous LSCS ♦ Previous ectopic ♦Infertility/assisted pregnancy/IVF

Figure-2: Demographic and clinical characteristics of patient with ectopic pregnancy

Most patients in this study presented with acute abdominal symptoms additionally amenorrhea, vaginal bleeding, vomiting, fainting was also noted.

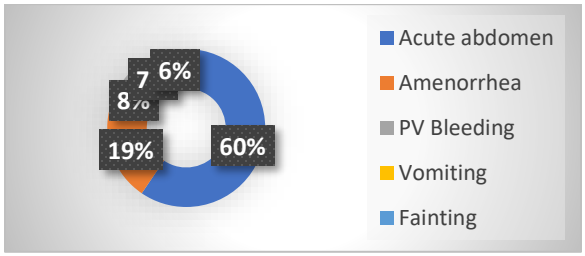


Figure-3: Presenting symptoms

The fallopian tube, especially the right side, was the most common site of ectopic implantation, with 108 out of 111 cases occurring there. Additionally, 2 cases were identified as scar ectopic, and 1 case was an ovarian ectopic. Rupture, a serious complication, occurred in 64 cases, representing 57.65% of those assessed, highlighting the need for prompt detection and intervention.

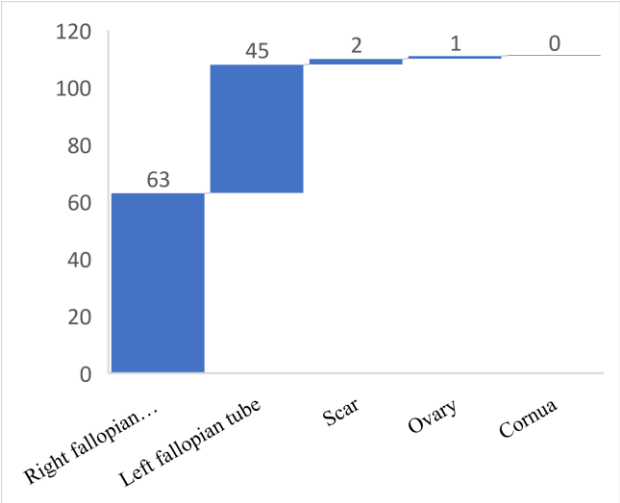


Figure-4: Location of ectopic pregnancy

The histopathological evaluation of the cases revealed a diverse spectrum of findings. Acute salpingitis was identified in 5 cases (4.6%), while chronic salpingitis was significantly more prevalent, observed in 61 cases (56.48%). Salpingitis isthmica nodosa was documented in 10 cases (9.2%), indicating a notable incidence of this specific condition.

Table-1: Cases with Additional Histopathological findings

Additional histopathological findings	No of cases
Acute salpingitis	5 (4.6%)
Chronic salpingitis	61 (56.48)
Salpingitis isthmica nodosa	10 (9.2%)
Walthard cell nests	7 (6.4%)
Mesothelial hyperplasia	7 (6.45%)
Normal	18 (16.66%)

Additionally, Walthard cell nests and mesothelial hyperplasia were present in 7 cases each (6.4% and 6.45%, respectively), 18 cases (16.66%) were classified as normal.

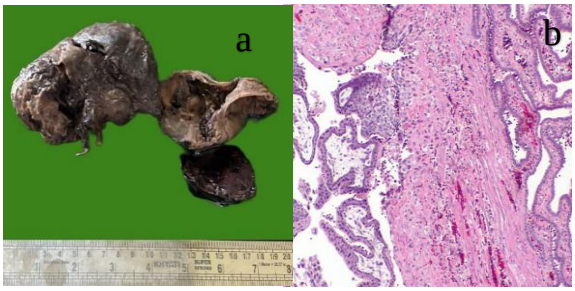


Figure-5: Tubal ectopic pregnancy

a) Gross picture demonstrates tube with dilated lumen & blood clots.
b) Microscopic analysis shows fallopian tube with luminal chorionic villi with central loose stroma, lined by cytotrophoblast & syncytiotrophoblast & hemorrhage (H&E, 400X).

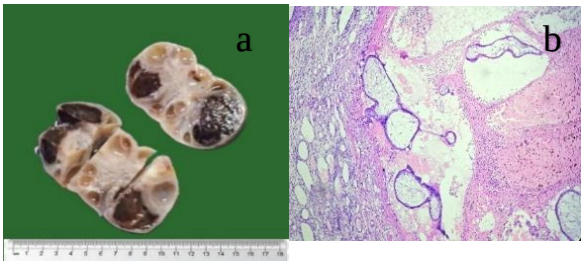


Figure-6: Ovarian ectopic pregnancy

a) The gross morphology of ovary exhibits hemorrhage, with a combination of solid and cystic components.
b) Microscopic examination reveals chorionic villi lined by cytotrophoblast and syncytiotrophoblast, surrounded by areas of hemorrhage within ovarian stroma, accompanied by a corpus luteal cyst (H&E, 400X).

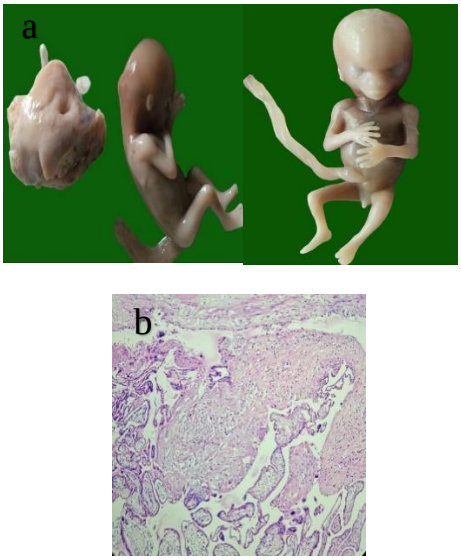


Figure-7: Scar ectopic pregnancy

a) The gross specimen shows scar tissue with fetal components.
b) Microscopic findings suggest hypertrophic & hyperplastic myometrial muscles with chorionic villi lined by cytotrophoblasts & syncytiotrophoblasts, decidual cells and trophoblastic tissue in myometrial vessels, suggestive of early gestational trophoblastic plugs.

DISCUSSION

Ectopic pregnancy incidence is on the rise, potentially attributed to advancements in diagnostic methodologies. Recently India has showcased a remarkable decline in ectopic pregnancy-related mortality owing to the timely identification and management protocols.[7]

Our study delved into histopathological analyses with evidence of ectopic trophoblastic tissue in 88.33% of cases characterized by the presence of chorionic villi and decidual changes.

Two cases diagnosed as scar ectopic pregnancies, revealed previous cesarean section scar tissue exhibiting hypertrophic & hyperplastic myometrial muscles, variably sized chorionic villi lined by cytotrophoblast and syncytiotrophoblast layers, along with clusters of decidual cells. Trophoblastic tissue

observed within focal myometrial vessels suggested the presence of trophoblastic plugs during early gestation.

One case diagnosed as ovarian ectopic exhibited chorionic villi, lining of cytotrophoblast tissue, accompanied by hyperplastic trophoblastic tissue. Additionally, areas of hemorrhage are observed, surrounded by ovarian stroma, with the presence of a hemorrhagic corpus luteal cyst. We based our diagnosis of ovarian ectopic pregnancy on Spiegelberg's criteria[8,] which includes the following:1) intact fallopian tubes, including fimbriae, that are separate from the ovary, 2) pregnancy occupying the ovary's normal position, 3) ovarian attachment to the uterus through utero-ovarian ligament, and 4) ovarian tissue present with the pregnancy in the specimen.

Our retrospective analysis emphasized the clinical and histomorphological aspects of ectopic pregnancies. The typical age group for involvement was seen to be 21-30 years (70.83%), consistent with findings by Neelima G et al., Beyaril C et al., Sharma S et al., and Medha Pradeep Kulkarni et al. [11-14]

Most patients were multigravidae, with a mean gravidity of 3. This aligns with the studies by Neelima G et al. and Beyaril C et al., which reported multigravidae status in 63% and 75% of cases, respectively. [11,12] Conversely, Sharma S et al. documented a higher prevalence of primigravidae (57%), contrasting with our findings.[13]

In our study, 39.68% of women presented at six weeks of gestation, a proportion comparable to the 35.8% reported by Neelima G et al.[11] The fallopian tube was the most common site of ectopic pregnancy (97.29%), consistent with existing literature, including studies by Neelima G et al., Beyaril C et al., Sharma S et al., and Medha Pradeep Kulkarni et al. [11-14]

Recently India has showcased a remarkable decline in ectopic pregnancy-related mortality owing to the timely identification and management protocols.[15-17]

Table-2: Comparison of findings with other studies

	Our study (n=120)	Neelima G et al.,[11] (n=128)	Beyaril C et al.,[12] (n=104)	Sharma S et al.,[13] (n=104)	Medha P Kulkarni et al.,[14] (n=55)
AGE (n=120)					
<=20	6(5%)	12(9.3%)	2(1.9%)	2(2.53%)	4(7.3%)
21-30	85(70.83%)	97(75.7%)	72(69.2%)	31(39.24%)	38(69.1%)
31-40	29(24.16%)	19(14.8%)	29(27.95)	23(29.11%)	11(20%)
>40	0	0	1(1%)	7(8.86%)	2(3.6%)
PARITY (n=87)					
0	22(25.28%)	23(26.7%)	22(21.2%)	57(72.15%)	-
1	10(11.49%)	10(11.6%)	44(42.3%)	10(12.66%)	-
2	41(47.12%)	40(46.5%)	28(26.9%)	8(10.13%)	-
3&>3	14(16.09%)	13(15.15)	3(2.9%)	4(5.06%)	-
GESTATIONAL AGE(n=67)					
5	8(11.9%)	7(8.9%)	-	-	-
6	25(39.685%)	28(35.8%)	-	-	-
7	7(11.11%)	7(8.9%)	-	-	-
8	12(19.04%)	14(17.95%)	-	-	-
>8	15(22.38%)	22(28.2%)	-	-	-
SITE (n=111)					
Fallopian tube	108(97.29%)	112(99.1%)	104(100%)	68(93.69%)	54(98.14%)
Ovary	1(0.9%)	-	0	3(3.79%)	1(1.8%)
Scar	2(1.80%)	-	0	1(1.26%)	0
Rudimentary	0	-	0	1(1.26%)	0

CONCLUSIONS

Clinicopathological correlation emerges as a cornerstone in the accurate diagnosis and effective management of ectopic pregnancy. While clinical presentation and imaging studies offer valuable clues, histopathological examination provides the definitive diagnosis, particularly in cases with atypical presentations or the absence of discernible trophoblastic tissue. This synergy between clinical and pathological perspectives enables a more in depth understanding of the disease process, encompassing the identification of underlying etiologies, potential complications, and implications for future fertility. The present study unequivocally establishes the indispensable role of clinicopathological correlation in navigating the complexities of this condition. This collaborative approach, harnessing the expertise of both clinicians and pathologists, is fundamental.

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