

**A Histopathological Study of Fallopian Tube Lesions**

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ABSTRACT

BACKGROUND: The word "fallopian tubes" comes from the 16th-century Italian surgeon and physician Gabriele Falloppio, who was also a specialist in anatomy, physiology, and pharmacology. The fallopian tubes are intricate organs that serve as more than just passageways connecting the ovary and the endometrial cavity. When the mature Graafian follicle bursts from the ovary, it suckers the ovum from the pelvic cavity. Additionally, fertilization occurs in the ampullary region of the fallopian tube. After fertilization, the ovum is sent to the uterus to continue developing. Starting from the uterine end, the fallopian tube is divided into four sections: the intramural, isthmus, ampulla, and fimbria. Every component has a unique characteristic and purpose of its own. Although surgical specimens from other gynecologic tract sites are more frequently removed than those specifically for lesions, the fallopian tube is still routinely examined by surgical pathologists because it often accompanies specimens removed for lesions of other gynecologic organs and because it is crucial to reproduction, including issues with infertility.

AIM: The aim was to evaluate the histological patterns of the fallopian tube in surgically resected specimens and to determine its relationship with uterine or ovarian pathology.

MATERIAL AND METHOD: The Department of Pathology carried out this retrospective investigation. Fallopian tube specimens that were received by the Department of Pathology were used in this investigation. Retrospective in nature, the study included one hundred consecutive cases of fallopian tube specimens obtained in the Department of Pathology's histopathology section as salpingectomies, pan-hysterectomies, or tubo-ovarian tumors. The requisition forms contained biographical and clinical data about the patient. In accordance with standard protocols for histopathological gross evaluation, the initial lesion that led to the surgery was grossly inspected and sampled. The SEE FIM protocol was followed for collecting the fallopian tube samples to guarantee the best possible histological assessment.

RESULTS: Patient specimens with Fallopian tubes totaling one hundred were taken from patients undergoing pan-hysterectomy with salpingectomy and salpingo-oophorectomy. 100 consecutive fallopian tube specimens, either received alone or in combination with other female genital tract organs, were carefully examined in the Department of Pathology's Histopathology unit. Of the surgical specimens, around 20% were salpingectomies and salpingo-oophorectomies, and the remaining 80% were pan-hysterectomies. With 52% of the cases, chronic salpingitis of the fallopian tube was the most common finding. In 21% of the instances, hydrosalpinx came next.

CONCLUSION: Many abnormal signs can appear in fallopian tubes. Although fallopian tube cancers are rare, a thorough examination is necessary to rule out a tubal pathology that may have preceded the cancer. Even though most surgical pathology specimens still have ordinary fallopian tubes, a histological investigation is necessary to reveal the pathological abnormalities. For this reason, a complete inspection of the fallopian tubes in every gynecologic specimen is necessary for the early diagnosis and management of these disorders.

KEYWORDS: Fallopian Tube, Salpingitis, Ectopic Tubal Pregnancy and Chronic Salpingitis

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INTRODUCTION

The apex of the wide ligament, which connects the uterine cornua and the ovaries, is home to the paired hollow structures known as fallopian tubes. Their length ranges from 7 to 12 centimeters, and they serve three purposes: collecting ovum, supplying a physical environment for conception and transportation, and feeding the fertilized ovum.¹

Since the fallopian tubes are rarely the location of primary illness, pathology students should regard them as precious organs. The most frequent ailment they experience is inflammation, which is nearly always a component of pelvic inflammatory disease. Much less frequently, endometriosis and the uncommon primary tumors are the next most common conditions affecting them, after ectopic

tubal pregnancy.² The oviduct, also called the Fallopian tube or the uterine tube, is a pair of hollow muscular tubes that are located at the upper edge of the uterus's wide ligament. One tube is on each side of the uterus. The Fallopian tube was initially described by Gabrileo Fallopio. In 1564, a posthumous publication of his organ work was made. The ciliated microstructure, vascular structure, and development of the fallopian tube all contribute to its complicated architecture. It holds the secret to ova and fertilization channel.² The fallopian tube opens as finger-like projections toward the ovary and is made up of the interstitial parts (uterine end), isthmus, ampulla (wider portion), and infundibulum. It is 11–12 cm long on average. The most prevalent infection among women in the reproductive age range is salpingitis, which is brought on by an ascending vaginal infection. About 11% of females are affected. Salpingitis raises the risk of ectopic pregnancies and can cause infertility.^{3,4}

Starting from the uterine end, the fallopian tube is divided into four sections: the intramural, isthmus, ampulla, and fimbria. Every component has a unique characteristic and purpose of its own. Any alteration to the fallopian tube's structure has the potential to impair this physiological process and result in infertility. Additionally, the fallopian tube's histology is altered by the cyclical hormonal fluctuations that affect women in the childbearing age group. Any anomaly in this area might result in infertility and associated problems.⁵ With an annual incidence of 3.6 per million women, fallopian tube primary malignancy accounts for less than 0.14–0.18% of all genital malignancies, making it an extremely rare occurrence. On the other hand, it seems that metastatic cancer to the fallopian tubes is more common. Nonetheless, tubal metastasis typically denotes a dismal prognosis. A diagnostic problem associated with fallopian tube malignancy is the difficulty in differentiating primary fallopian tube carcinoma from primary ovarian and primary endometrial carcinoma.^{6,7} A review of the literature indicated that while a wide range of illnesses, from salpingitis to cancer, can affect fallopian tubes, there are very few studies that describe the histological alterations that occur when a fallopian tube is removed for whatever cause. Given that this is a typical specimen in the general surgical pathology laboratory, the pathologist who notices a potentially uncommon histological result may find it helpful to know how frequently these changes occur in a general pathology practice. The majority group is observed to consist of tubal pathology with

inflammatory lesions, which is followed by tubal ectopic pregnancy, a significant contributor to maternal morbidity and mortality.^{8,9} Primary carcinoma is an uncommon discovery. Recent research, however, has shown that tubal epithelium may be the source of ovarian, peritoneal, and tubal carcinomas. Ectopic tubal pregnancy is the most common cause of tube damage, followed by endometriosis and infrequently, primary malignancies.¹⁰ It has been noted that the Fallopian Tubes can become secondary involved with other principal sites, primarily the ovaries, the cervical region, and the endometrium.^{11,12} A bad prognosis is typically indicated by tubal metastases. The goals of the current investigation were to assess the fallopian tube's histological patterns in surgically removed tissues and ascertain whether they were associated with ovarian or uterine pathology.

MATERIAL AND METHODS

The Department of Pathology carried out this retrospective investigation. Fallopian tube specimens that were received by the Department of Pathology were used in this investigation. Retrospective in nature, the study included one hundred consecutive cases of fallopian tube specimens obtained in the Department of Pathology's histopathology section as salpingectomies, pan-hysterectomies, or tubo-ovarian tumors. The requisition forms contained biographical and clinical data about the patient. In accordance with standard protocols for histopathological gross evaluation, the initial lesion that led to the surgery was grossly inspected and sampled. The SEE FIM protocol was followed for collecting the fallopian tube samples to guarantee the best possible histological assessment. The study included all specimens of salpingectomy performed for TAH with BSO, Ligation with or without MTP, unilateral Salpingectomy, or Salpingo-oophorectomy. Generally, if there is obvious gross pathology, at least two sections of the fallopian tube are extracted; if not, only one section is taken for processing if the fallopian tube appears to be within normal limits. In abnormal instances, slides stained with hematoxylin and eosin were examined by a minimum of two pathologists. While the histology slides were painstakingly re-examined for a detailed investigation of the histological patterns of diverse fallopian tube lesions, the clinical forms were scrutinized for age, clinical presentation, and physical features of the material.

Inclusion Criteria:

- All specimens sent with fallopian tubes to the histopathology section of the Department of

Pathology, irrespective of age were included in the study.

- Patients in the age group of 20 – 80 years
- Hysterectomy with salpingo-oophorectomy
- Salpingectomy
- Tubal ligation with or without MTP

Exclusion Criteria:

- The specimens without Fallopian Tubes were excluded from the study.
- Patient refusal
- Anatomically distorted fallopian tube (ruptured tubal pregnancy)
- Patients with HBV, HCV, and HIV infections.

Study technique:

Each patient had a separate form filled out with their registration number, name, age, address, parity, menstrual history, relevant past medical history, and the results of their gynecological and general examinations. The uterus' height was measured, and a vaginal examination was also performed. Urine and blood tests were conducted routinely. Tests for VDRL, HBsAg, HIV, HCV, and CA 125 antigen were also performed on the blood. An abdominal USG was also performed. Upon post-operatively examining the uterus, tubes, and ovaries grossly, the length of each fallopian tube was measured. Every fallopian tube was examined for dilatation, tumor, nodule, rupture, cyst, and sterilization clip. Tumor size, color, consistency, necrosis, bleeding, and serosal involvement were determined. Additionally looked for were luminal blockage, pus, placental tissue, and bleeding. Notable were the cysts' dimensions, relationship to the fallopian tubes, and fluid kind.

The fallopian tube's distal 2 cm, or the fimbrial end, was severed from the remainder of the tube and longitudinally sectioned in accordance with

protocol. The remaining tube was divided into bread-loaf-like cross pieces every two to three millimeters. The specimen was sent in its entirety for processing. Since early neoplastic epithelial lesion or in situ epithelial lesion was most frequently observed in the fimbriae, this sampling strategy guaranteed that the surface epithelium of the fimbria was extensively exposed. Three of the investigators examined the slides after staining each section with hematoxylin and eosin in order to make a diagnosis. In accordance with the guidelines, the patients' clinical history was gathered on a pre-made proforma. The specimen was grossed, and measurements of its size, surface, cross-sectional surface, and contents were made. For microscopic analysis, three cross-sections of the proximal, mid, and distal sections of each tube were obtained. The fimbriated end was sectioned longitudinally for maximum exposure, and the proximal portion was serially cross-sectioned at intervals of 2-3 mm. The pieces underwent regular processing. After doing an H&E staining, microscopic results were examined.

STATISTICAL ANALYSIS

Data obtained were statistically analyzed using frequency and cross-tabulation procedures in IBM SPSS software version 20.0 for Windows.

RESULT: -

Patient specimens with Fallopian tubes totaling one hundred were taken from patients undergoing pan-hysterectomy with salpingectomy and salpingo-oophorectomy. 100 consecutive fallopian tube specimens, either received alone or in combination with other female genital tract organs, were carefully examined in the Department of Pathology's Histopathology unit. Of the surgical specimens, around 20% were salpingectomies and salpingo-oophorectomies, and the remaining 80% were pan-hysterectomies.

Table 1: Showing the different Age groups in the study

Age Range	Number	Percentage
20-29	10	10%
30-39	18	18%
40-49	50	50%
50-59	14	14%
60-69	6	6%
70-79	2	2%

Table 1 shows that most of the cases 50 were between the age range (40-49) yrs. which accounted for 50% followed by the age range of (30-39) yrs. which is 18%. The lowest age was 20yrs and the highest was 79 yrs. in our study.

Table 2: Showing the distribution of Pathological lesions in the Fallopian Tube

Diagnosis	Number	Percentage
Chronic Salpingitis	52	52%
Hydrosalpinx	21	21%
Normal Histology	3	3%
Haemato salpinx	1	1%
Ectopic pregnancy	6	6%
Unremarkable	11	11%
Others	6	6%

With 52% of the cases, chronic salpingitis of the fallopian tube was the most common finding. In 21% of cases, hydrosalpinx followed, as Table 2 above illustrates. In six cases, or 6%, ectopic pregnancy was identified. In two cases, Krukenberg's tumor of the ovary and dysgerminoma both had secondary metastases in the tube. In this investigation, 3 cases (3%) had normal histology while 11 cases (11%) had unremarkable results. There was no statistically significant correlation found between the gathered cases.

Table 3- Showing distribution of cases according to the type of surgery performed

Sr. No	Surgical Procedure	Frequency	%
	Salpingectomy	12	12.0
	Unilateral salpingo-oophorectomy	03	3.0
	Bilateral salpingo-oophorectomy	01	1.0
	Total abdominal hysterectomy with unilateral salpingo-oophorectomy	02	2.0
	Total abdominal hysterectomy with bilateral salpingo-oophorectomy	27	27.0
	Tubal ligation	55	55.0
	Total	100	100.0

Tubal sterilization was the clinical indication in the majority of the patients—55 cases, or 55.0%—of the patients. Of the 55 cases, 29 (or 29.0%) involved pregnant women who had tubal sterilization done concurrently with a cesarean section; 25 other cases (25.0%) involved sterilization after vaginal delivery; and 1 case (or 1% of the cases) involved dilatation and curettage along with tubal sterilization.

DISCUSSION

Our study comprised 100 specimens of Fallopian Tubes, of which 11 had been marked as unremarkable. The most common diagnosis was Inflammatory, followed by ectopic pregnancy which was consistent with the findings of **Bagwan et al.2004**⁸ There were more patients with tubal pathology than with unremarkable tubes in this investigation since only 11 individuals had unremarkable results. The most prevalent ailment of the fallopian tubes is inflammation, which nearly usually occurs as a component of pelvic inflammatory disease. Primary fallopian tube disease is uncommon.² Thirty to forty percent of female infertility cases have been attributed to tubal illness.¹³ In a histopathological study of the spectrum of lesions encountered in the fallopian tube, **Bagwan et al.2004**⁸ noted tubal pathology in only 33.48% of

the specimens with inflammatory lesions of the tube forming the major group followed by tubal ectopic pregnancies.

The clinical entity known as pelvic inflammatory disease (PID), which is the general term for inflammatory processes in this region, has salpingitis as the pathologic correlate. The fallopian tube is thought to be the epicenter and likely the source of the inflammation.^{3,4,14} Acute salpingitis usually affects young, sexually active girls in the reproductive age range and is caused by an ascending infection from the cervix and uterus.¹⁵ Hematogenous tuberculosis of the tube develops; most patients are young, and infertility is prevalent. In eighty percent of instances of tuberculous salpingitis, there is reported concurrent involvement of the endometrium.¹⁶

Seidman et al.2009¹⁷ found that 27% of the Fallopian Tubes had Chronic Salpingitis which was not associated with any ovarian pathology but these figures increased to 53% when it was associated with epithelial tumors of the ovary. The Fallopian tube is the most prevalent location for ectopic pregnancy in India, where the incidence is 3.12 per 1000 pregnancies, with the ovary and abdominal cavity coming in second and third. In the present study, we

had 8 cases of Ectopic Pregnancy which were proved histopathologically, which accounted for 2.47% of the total cases. This finding was consistent with the finding of **Manjunath et al.2016**.¹⁸

Of female genital cancers, primary fallopian tube carcinoma (PFTC) accounts for just 0.14–1.8% of cases. Hormonal, reproductive age group, and BRCA-1 and BRCA-2 mutations are the main risk factors.¹⁹ To understand the incidence of PFTC and how it relates to breast cancer, one must be familiar with the imaging characteristics. In our investigation, there was not a single example of a primary tumor, benign or malignant. An unintentional discovery in our investigation of two patients with ovarian dysgerminoma and Krukenberg tumor was metastatic carcinoma of the fallopian tube. These findings were consistent with the studies done by **Bagwan et al.2004**⁸ and **Kujur et al.2016**.²⁰

In a study conducted by **Jennifer L. Hunt et al. 2002**²¹, tubal ligation and total abdominal hysterectomy with bilateral salpingo-oophorectomy were done in 38.62% of the cases each followed by salpingectomy and unilateral salpingo-oophorectomy done in 22.76% of the cases. In **Jha R et al. 2006**²², total abdominal hysterectomy with bilateral salpingo-oophorectomy was done in 56.12% of cases, and total abdominal hysterectomy with unilateral salpingo-oophorectomy in 5.88% of cases. In **Gon S et al. 2013**⁶ total abdominal hysterectomy with bilateral salpingo-oophorectomy was done in 75.11% of cases followed by salpingectomy in 14 % of cases, unilateral salpingo-oophorectomy in 5.86% of cases and tubal ligation in 5% cases.

The term "hematosalpinx" refers to bleeding into the fallopian tubes, and the most frequent cause of this condition is tubal pregnancy. The location of the blood collecting site identifies the cause of tubal pregnancy; if the tube bursts at the inferior end, the condition manifests as a wide ligament hematoma. If the tube bursts on the tube, this could result in pelvic hematocele. Hematosalpinx may occur if the bleeding happens inside the tube without any ruptures or abortions. The majority of para-tubal cysts (PTCs) are benign cysts that are the remains of paramesonephric or mesonephric ducts. Although these masses have been documented in all age groups, from the premenarchal stage to menopause, they are most frequently observed in the third and fourth decades of life. In our study, one instance of para-tubal cysts and one case of hemo-salpinx were discovered. Para-tubal cysts have no clinical

significance and our finding was similar to the findings of **Mahajan et al.2016**.²³

A common specimen in the surgical pathology laboratory is the fallopian tube. It is removed either by itself as a specimen from a tubal ligation or salpingectomy, or in combination with other surgical pathology specimens such as oophorectomy and/or hysterectomy. The pathologist must section the fallopian tubes serially and submit all of the representative tissue for microscopic examination in order to ensure that the diagnosis of these pathological entities is not overlooked, even though the fallopian tubes remain unremarkable in the majority of surgical pathological specimens. Additionally, the fallopian tubes must undergo histopathological examination to demonstrate the pathological lesions.

CONCLUSION:

We therefore close this discussion with the idea that every gynecologic specimen received for histopathology should have its fallopian tubes carefully examined, and that tubal pathology histological patterns should be well recognized. This is because the small organ has become increasingly important in matters pertaining to female infertility as well as serving as the site of origin for high-grade serous cancers of the ovary and peritoneum. If the underlying tubal pathology or predisposing factors are identified and treated promptly, both of these illnesses can be cured. It is necessary to carefully inspect the Fallopian tube that was sent for histology and to properly research the patterns found in the tissue. This uncomplicated organ is significant for research on ectopic pregnancies and female infertility, but it's also a possible source of high-grade serous cancer of the ovary and peritoneum. We can lessen the burden and treat these cases sooner if the antecedent tubal disease in these carcinomas is found.

REFERENCES: -

1. Anderson JR, Genadry R. Anatomy and embryology. In: Berek JS. Novak's Gynaecology: Lippincott Williams and Wilkins, 2002;13:69-121.
2. Kumar V, Cotran RS, Robbins SL. Female genital system and breast. In: Kumar V, Cotran RS, Robbins SL (eds). Basic Pathology: Harcourt Asia PTE.LTD. 2001;6:597-636.
3. McCormack WM. Pelvic inflammatory disease. N Engl J Med 1994; 330: 115-19.
4. Paavonen J. Pelvic inflammatory disease. From diagnosis to prevention. Dermatol Clin 1998; 16: 747- 56

5. Jansen RP. Cyclic changes in the human fallopian tube isthmus and their functional importance. *Am J Obstet Gynecol.* 1980;136(3):292-308.
6. Gon S, Basu A, Majumdar B, Das TK, Sengupta M, Ghosh D. Spectrum of histopathological lesions in the fallopian tubes. *Journal of Pathology of Nepal* 2013;3:356-60.
7. Lakshmi K, Baleswari G, Mallikarjun C, Arasi TD, Rao BL. Histopathological study of the spectrum of lesions in the fallopian tubes. *Journal of evolution of medical and dental sciences* 2015;4(3):350-5.
8. Bagwan IN, Harke AB, Malpani MR, Deshmukh SD. Histopathological spectrum of lesions encountered in the fallopian tube. *J Obstet Gynecol Ind.* 2004;54(4):379-82.
9. K SS, K AS. Clinical study of ectopic pregnancies in a tertiary care hospital of Mangalore. *Innov J Med Health Sci.* 2014;4:305-9.
10. Barnhart KT. Ectopic pregnancy. *N Engl J Med* 2009; 361:379-87.
11. Rosenblatt KA, Weiss NS, Schwartz SM. Incidence of malignant fallopian tube tumors. *Gynecol Oncol* 1989; 35: 236-39.
12. Wilcox R, Gwin K, Montag A. The incidence of fallopian tube primaries reaches 15% of all adnexal tumors when standardized grossing protocols are followed. *Lab Invest* 2009; 89(1): 241.
13. Margara RA, Trew GH. Tubal disease. In: Shaw RW, Soutter WP, Stanton SL (eds). *Gynecology: Churchill Livingstone*, 1997; 2:319-28.
14. Washington AE, Aral SO, Wolner-Hanssen P, Grimes DA, Holmes KK. Assessing risk for pelvic inflammatory disease and its sequelae. *JAMA* 1991; 266: 2581-86.
15. Thor AD, Young RH, Clement PB. Pathology of the fallopian tube, broad ligament, peritoneum, and pelvic soft tissues. *Hum Pathol* 1991; 22: 856-67.
16. Nogales-Ortiz F, Tarancon I, Nogales FF Jr. The pathology of female genital tuberculosis. *Obstet Gynecol* 1979; 53: 422-28.
17. Barnhart KT. Ectopic pregnancy. *N Engl J Med* 2009; 361: 379-87.
18. Manjunath H K et al. Spectrum of lesions encountered in Fallopian tube histopathology; Retrospective analysis: our experience; *Archives of Cytology and Histopathology Research*, July-September, 2016;1: 45- 49.
19. Crum CP, Drapkin R, Kindelberger D, Medeiros F, Miron A, Lee Y. Lessons from BRCA: the tubal fimbria emerges as an origin for pelvic serous cancer. *Clin Med Res* 2007;5:35-44.
20. Kujur Pratima, Kosam Shashikala, Gupta Anurag. Histopathological Study of Spectrum of Lesions Seen in Surgically Resected Specimens of Fallopian Tube. *Int J of Sci Stud* 2016; 4:39-43.
21. Hunt JL, Lynn AA. Histologic features of surgically removed fallopian tubes. *Arch Pathol Lab Med.* 2002;126(8):951-5.
22. Jha R, Pant AD, Jha A, Adhikari RC, Sayami G. Histopathological analysis of hysterectomy specimens. *JNMA J Nepal Med Assoc.* 2006;45(163):283-90.
23. Mahajan D et al. Histological Patterns in Fallopian Tube Pathology- A Retrospective study of 200 Consecutive Cases. *JK Science* 2016;18:23-30.