

Histological Patterns in Fallopian Tube Pathology - A Retrospective Study of 200 Consecutive Cases

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Abstract

The present study was undertaken to evaluate the histological patterns in the various pathological lesions of the fallopian tube. Histology slides of 200 gynaecological specimens containing one or both the fallopian tubes were studied retrospectively and the morphological patterns observed in different tubal pathologies were documented. Tubal pathology was observed in 31% (62/200) of the cases studied. Salpingitis, accounting for 12% (24/200) of the cases was the most common lesion followed by ectopic tubal gestation (10.5%), paratubal cysts (4%), haematosalpinx (1.5%), endometriosis (1%) and torsion of the tube (1%) in decreasing order of frequency. No primary neoplasm of the fallopian tube was observed, however, there were two cases of secondary involvement of the tube by a dysgerminoma ovary and a squamous cell carcinoma of the cervix respectively. Fallopian tubes are primarily involved by inflammatory pathology which manifests either as infertility or as ectopic tubal pregnancy. Recently, the fimbrial end of the tube has been recognized as the site of origin of high grade serous ovarian and peritoneal cancers. Hence, a thorough examination of the fallopian tubes in each gynaecologic specimen is essential for early detection and treatment of these conditions.

Key Words

Fallopian Tube, Salpingitis, Ectopic Tubal Pregnancy, High Grade Serous Carcinoma

Introduction

The fallopian tubes are paired hollow structures that run throughout the apex of the broad ligament, spanning the distance between the uterine cornua and the ovaries. They vary in length from 7-12 cm and their function includes ovum pick-up, provision of physical environment for conception and transport and nourishment of the fertilized ovum (1). The fallopian tubes should be treasured organs to the pathology student because they are so seldom the site of primary disease. Their most common afflictions are inflammation, almost always as part of pelvic inflammatory disease. Much less often they are affected by ectopic tubal pregnancy followed in order of frequency by endometriosis and the rare primary tumours (2). Surgical specimens removed specifically for lesions of the fallopian tube are much less common than specimens from other sites in the gynaecologic tract;

nonetheless, the fallopian tube is frequently examined by the surgical pathologist because it accompanies specimens removed for lesions of other gynaecologic organs, and also because the tube plays an important role in reproduction, including problems related to infertility (3). The present study endeavours to document the spectrum of histological patterns encountered in various lesions of the fallopian tube.

Material and Methods

The study was conducted in the Department of Pathology, Government Medical College Jammu and was approved by the institutional ethics committee. The study design was retrospective, encompassing 200 consecutive cases of fallopian tube specimens received either as salpingectomies or as a part of panhysterectomies or tubo-ovarian masses in the histopathology section of

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Department of Pathology. The clinical-history cum grossing-notes forms and the haematoxylin and eosin stained histopathology slides of these cases were retrieved from the department archives for the purpose. The clinical forms were reviewed for age, clinical presentation and gross features of the specimen while the histology slides were meticulously re-examined for a detailed analysis of the histological patterns of various fallopian tube lesions. Fresh sections were obtained from the gross specimens or from the paraffin blocks, routinely processed and stained with H&E or other special stains wherever necessary (4).

Result

200 consecutive specimens of fallopian tubes received separately or with other female genital tract organs in the histopathology section of the Department of Pathology were studied thoroughly. Approximately 80% of these were pan-hysterectomies with salpingectomies and salpingo-oophorectomies accounting for the remaining 20% of the surgical specimens. The cardinal clinical or pathological diagnoses for which the surgical procedure was primarily performed spanned a wide range of lesions of the female genital tract, commonest being fibroid uterus (47.5% of the cases), followed by dysfunctional/abnormal uterine bleeding (17.5%), ovarian cyst/mass (15%), ectopic tubal pregnancy (10.5%), tubo-ovarian mass (2%), torsion of the ovary and tube (1%), chronic cervicitis (1%), utero-vaginal prolapse (1%), pelvic inflammatory disease (1%), carcinoma cervix (1%), carcinoma endometrium (1%), paratubal cyst (0.5%), hydatidiform mole (0.5%) and placenta accreta (0.5%) in decreasing order of frequency. In an overwhelming majority of the gynaecologic specimens (69%, 138/200), both the fallopian tubes were grossly and microscopically unremarkable. The fallopian tubes, in these cases, were removed as a part of a standard surgical protocol, while the primary pathology lay elsewhere in the female genital tract. In 62 cases a pathological lesion was observed in either of the tubes, thus, accounting for 31% of the total cases.

The distribution of the pathological lesions of the fallopian tube is depicted in *Table-1*, while *Table-2* summarizes the age-wise distribution of these lesions.

Salpingitis or inflammation of the fallopian tube was

the most common histological pattern of tubal pathology encountered in the present study accounting for 24 cases (12%). 20 cases (10%) were labelled as chronic non specific salpingitis, 2 (1%) as granulomatous salpingitis and one each as pyosalpinx (0.5%) and salpingitis isthmica nodosa (0.5%). Majority of the cases (n=20) belonged to 21-50 years age group, i.e. the period when females are likely to be sexually active. Chronic salpingitis was characterized by a variable morphology ranging from blunted plicae with a dense lymphocytic infiltrate in the wall to markedly fibrotic lesions with thick walled tubes, luminal narrowing and almost complete flattening of the epithelial lining (*Fig. 1*). In four of these cases, the inflammatory exudate had spread to the ovary with adhesion of the tubes to the ovaries resulting in formation of tubo-ovarian masses. There was one case of pyosalpinx wherein the fallopian tube was distended and filled with pus. There was accompanying carcinoma endometrium which probably had interfered with the normal drainage of the tube. Two cases of granulomatous salpingitis were observed with a presumptive diagnosis of tuberculosis and both showed the presence of caseating epithelioid granulomas and Lang Hans giant cells in the wall of the tube. One of these cases had presented clinically with primary infertility. A single case of salpingitis isthmica nodosa was seen, characterized by bilateral nodular enlargement of the isthmic portion of the fallopian tubes grossly and by the presence of cystically dilated gland-like formations surrounded by hypertrophic muscle microscopically.

Ectopic tubal gestation, accounting for 21 cases (10.5%), was the second most frequent tubal pathology observed in the present study. All these cases were received as salpingectomy specimens and most of the patients were below 35 years of age. Chorionic villi or trophoblastic tissue were identified microscopically either in the wall of the tube or in the accompanying blood clot in the majority of the cases (*Fig. 2*). In five cases a presumptive diagnosis of tubal pregnancy was rendered on the basis of the presence of decidual tissue in the wall of the tube with accompanying haemorrhage in an appropriate clinical setting. Tubal congestion and edema were evident in all the cases and accompanying chronic salpingitis was observed in six cases.

Table 1. Distribution of Pathological Lesions of The Fallopian Tube

| Tubal Morphology | No. of Cases | Percentage |
|-----------------------------|--------------|------------|
| Normal | 138 | 69% |
| Abnormal | 62 | 31% |
| Salpingitis | 24 | 12% |
| Acute | 1 | 0.5% |
| Chronic | 20 | 10% |
| Granulomatous | 2 | 1% |
| Salpingitis Isthmica Nodosa | 1 | 0.5% |
| Ectopic tubal gestation | 21 | 10.5% |
| Paratubal cyst | 8 | 4% |
| Haematosalpinx | 3 | 1.5% |
| Endometriosis | 2 | 1% |
| Torsion | 2 | 1% |
| Tumours (secondary) | 2 | 1% |

Fig. 1 Photomicrograph of Chronic Salpingitis Showing Markedly Thickened Fallopian Tube Wall with a Chronic Inflammatory Infiltrate and a Small Lumen with Loss of Plicae (X40)

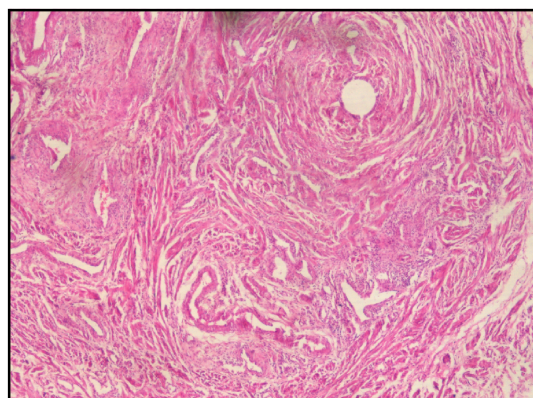


Table.2 Age-Wise Distribution of Fallopian Tube Lesions

| Tubal Pathology | 11-20 Years | 21-30 Years | 31-40 Years | 41-50 Years | 51-60 Years | 61-70 Years | Total |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| Salpingitis | 1 | 5 | 5 | 10 | 2 | 1 | 24 |
| Ectopic tubal gestation | 1 | 14 | 6 | | | | 21 |
| Paratubal cyst | | 1 | 3 | 4 | | | 8 |
| Haematosalpinx | | | 3 | | | | 3 |
| Endometriosis | | | 1 | 1 | | | 2 |
| Torsion | 1 | 1 | | | | | 2 |
| Tumours | | 1 | | | | 1 | 2 |
| Total | 3 | 22 | 18 | 15 | 2 | 2 | 62 |

Fig. 2 Photomicrograph Showing Chorionic Villi and Trophoblastic Tissue in Tubal Wall in a Case of Ectopic Tubal Gestation (X40)

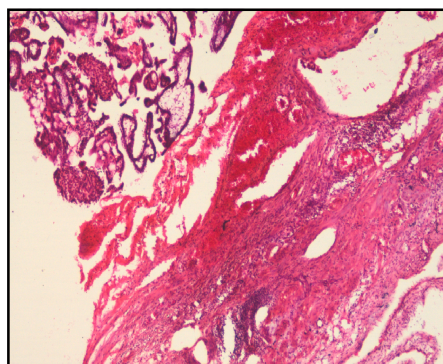
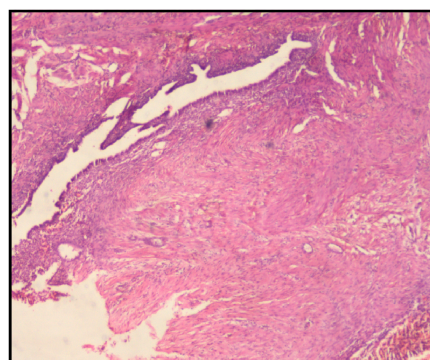


Fig. 3 Photomicrograph of Endometriosis of Fallopian Tube Showing an Endometrial Gland and Stroma in the Wall with Accompanying Haemorrhage (X40)

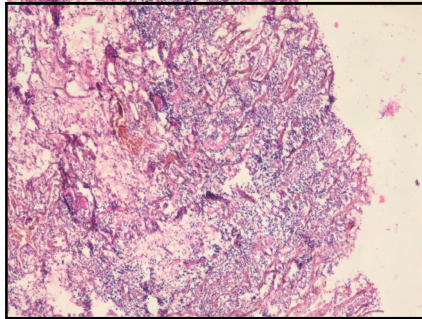


8 cases (4%) of paratubal cysts were observed. They were seen as small round cysts, with papery thin walls and diameters ranging from 1.5cm to 9cm, attached to the tube and mostly filled with clear watery fluid. Most were discovered incidentally during surgery.

Microscopically the cysts were lined by flattened to cuboidal epithelium surrounded by thin fibrous walls.

Haematosalpinx, not associated with tubal gestation, accounted for 1.5% (3/200) of the cases while there were 2 cases (1%) of torsion of the tube and ovary,

Fig. 4 Photomicrograph Showing Infiltration of The Fallopian Tube Wall By Nests of Tumour Cells Separated By Fibrous Septae From A Dysgerminoma Ovary (X40)



characterized by haemorrhagic infarction of both the organs. Tubal endometriosis was seen as presence of endometrial glands with stroma in the wall (Fig. 3). Two (1%) such cases were observed in females aged 48 and 38 and both had bilateral tubal involvement along with endometriosis of the ovaries.

There was no case of a primary benign or malignant neoplasm of the fallopian tube in this study. However, 2 cases (1%) showed secondary involvement of the fallopian tubes by tumours. One was a 25 year old female with dysgerminoma of the ovary invading the ipsilateral tube with accompanying omental and nodal metastases. Nests of tumour cells were seen infiltrating the wall of the tube on the serosal aspect (Fig. 4). The second case was that of a widely metastatic squamous cell carcinoma of the cervix in a 71 year old female.

Discussion

Fallopian tubes are rare sites of primary disease and their most common afflictions are inflammation, almost always as part of pelvic inflammatory disease (2). Tubal disease has been held accountable for 30-40% of the cases of female infertility (5). In a histopathological study of spectrum of lesions encountered in the fallopian tube, Bagwan et al 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 (6). In the present study too, only 31% (62/200) of the gynaecologic specimens revealed a pathological lesion of one or both the fallopian tubes and salpingitis, alone, accounted for 12% (24/200) of the cases, followed closely by ectopic tubal pregnancies that accounted for 10.5% (21/200) of the cases.

Salpingitis is the pathologic correlate of the clinical entity pelvic inflammatory disease (PID) which is the generic term used for inflammatory processes of this region in which fallopian tube is the epicentre and presumably the source of the inflammation (7,8,9). Acute salpingitis, in most cases, develops as a result of ascending infection from the cervix and uterus and typically occurs in young, sexually active females of reproductive age group (3,10). Tuberculosis of the tube develops by the haematogeneous route; most patients are young and infertility is common. Concomitant involvement of the endometrium has been documented in 80% of the cases of tuberculous salpingitis (11). Majority of the cases of salpingitis, in this study, belonged to the reproductive age group. Two cases of tuberculous salpingitis were recorded, one had presented with primary infertility and the other had a synchronous involvement of the endometrium by tuberculosis.

The incidence of ectopic tubal pregnancy has increased markedly in recent times and it is often the consequence of chronic salpingitis which is found in nearly half the patients with a reported range of 29-88% (12,13). The usual outcome is haematosalpinx and tubal rupture can occur resulting into intra abdominal haemorrhage. The usual treatment is salpingectomy (14). In the current study ectopic tubal pregnancy accounted for 10.5% (21/200) of the total cases studied and all were received as salpingectomy specimens. 6 out of these 21 cases (28.5%) showed associated features of chronic salpingitis on microscopic examination and the figure would have been higher but for the the accompanying haemorrhage that obscured cellular details in most of the cases.

Paratubal cysts, though a common finding, do not have much clinical significance (6). 8 cases of paratubal cysts were noted in the present study and all except one were discovered incidentally during surgery.

Haematosalpinx (3 cases), endometriosis (2 cases) and torsion (2 cases) were the remaining non-neoplastic tubal lesions recorded in this study. Concurrent endometriosis of the ovaries was observed in both the cases of endometriosis of the tube while torsion was evident as haemorrhagic infarction of the fallopian tube and the ipsilateral ovary. Torsion of the tube and ovary has been observed to be usually secondary to inflammation or tumour and the appearance at surgery is that of a haemorrhagic infarct (15).

No primary fallopian tube neoplasm was observed in the present study, though there were two cases with

secondary involvement of fallopian tube by a tumour, one by a squamous cell carcinoma of the cervix and the other by a dysgerminoma of the homolateral ovary. Traditionally, primary carcinoma of the fallopian tube has been regarded as very rare, accounting for approximately 1% of primary genital tract malignancies (16). However, several recent studies following a standardized grossing protocol and including a larger number of early stages have shown that it reaches approximately 15% of all adnexal tumours (17). Moreover, the interesting possibility that a high percentage of ovarian and 'primary peritoneal' serous carcinomas actually originate in the epithelium of tubal fimbriae is a topic of hot discussion (18,19,20). This is a relatively recent and novel concept with histologic, immuno-histochemical and molecular biologic evidence that supports the tubal fimbriae as the site of serous

tubular intra-epithelial carcinoma and possibly the immediate precursor to high-grade ovarian and peritoneal serous carcinoma (21). In fact the fimbriae are the most common site of early serous carcinoma in women with BRCA mutations (22).

Conclusion

Thus we conclude this discussion on the premise that fallopian tubes in each gynaecologic specimen received for histopathology, must be examined thoroughly and histological patterns of tubal pathology must be well recognized because this small organ has taken centre stage not only in issues related to female infertility but also increasingly as the site of origin of high grade serous cancers of the ovary and peritoneum. Both these conditions are curable if the predisposing or the precursor tubal pathology is detected and treated in time.

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