Section: Pathology

Original Research Article

HISTOPATHOLOGICAL STUDY OF SPECTRUM OF LESIONS SEEN IN SURGICALLY RESECTED SPECIMENS OF FALLOPIAN TUBE

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Abstract

Background: Fallopian tube is affected by a wide spectrum of diseases varying from salpingitis to carcinoma. As this is a common specimen in the surgical pathology laboratory, knowledge of the frequency of these various pathological lesions involving fallopian tube can be valuable to pathologists, who may identify an unusual histological finding. **Materials and Methods:** A total of 100 surgically resected specimen of fallopian tube of all age group of patients which are received from July 2021 to December 2021 are processed in the department of Pathology, JLNMC, Bhagalpur, Bihar, India with routine histopathological techniques. All poorly fixed specimens are excluded from the study. **Result:** In our study most of the patients are in the post-menopausal age group (44%) and premenopausal age group (25.50%), Most of the patient's undergone total abdominal hysterectomy with salpingo-oophorectomy (60%) and few patients's undergone unilateral salpingectomy (10%). (Table.3) In our study most of the cases show unremarkable histology i.e., 31.50% and least number of cases show serous tubal intraepithelial carcinoma, high grade (0.50%). **Conclusion:** Present study shows broad spectrum of pathological lesions nature. in fallopian tube. Majority of the lesions are non neoplastic in Neoplastic pathology is rare.

INTRODUCTION

Introduction The fallopian tubes are complex structures that connect ovaries to the endometrial cavity. They are sites of various interactions necessary for normal pregnancy.[1] It is a common specimen in a pathology laboratory and may be examined either alone as a salpingectomy specimen or as a part of a more complex specimen from a hysterectomy and/or oophorectomy operation.[2]

Although fallopian tube is affected by a wide spectrum of diseases, literature search reveals that there are only few studies documenting histological changes in fallopian tube removed for all reasons. One of the causes of secondary infertility is inflammation and neoplasm of fallopian tube. Ectopic pregnancy even though uncommon, but may be detected by routine ultrasound, which if undetected could cause maternal death.[3,4] Ectopic pregnancy is a complication of pregnancy in which the embryo is attached outside the uterus, and fallopian is a common site. Signs and symptoms classify include abdominal pain and vaginal bleeding.[5-9] Those who have previously had an ectopic pregnancy are at much higher risk of having another one.[10] Most of the ectopic pregnancies (90%) occur on the fallopian tube, which are known as tubal pregnancy.[10] The rate of ectopic pregnancy is about 1% to 2% that of live birth in developed countries, though it may be as high as 4% among those using assisted reproductive technology.[8]

Inflammatory disease of tube (salpingitis) remains responsible for a significant percentage of cases of secondary infertility by occlusion or stenosis. Hence in this modern era of advancement it has become a necessity to study in details the pathology of various fallopian tube diseases. Risk factors for ectopic pregnancy also include pelvic inflammatory disease, often due to tuberculosis, salpingitis, prior tubal surgery and the uses of assisted reproductive technology.[10]

Bacterial infection of the fallopian tube is a common disease, and its incidence keeps increasing. It may follow invasive procedures (such as curettage or the insertion of intrauterine devices),[11] and it commonly accompanies endometriosis,[12] but in most cases it is due to an ascending infection, often sexually transmitted.[13] The inflammation may result in fusion of tubal plicae and obliteration of the ostium. Obstruction of the fimbrial end of fallopian tube and, less commonly, of the intramural or isthmic portion may lead to infertility.[14] Microscopically, the trapped epithelial spaces produce a complex gland like pattern that can stimulate malignancy.[15]

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The lumen is often distended and filled with secretions or pus (pyosalpinx). Massive intraluminal hemorrhage may lead to the formation of hematosalpinx, a rare condition that needs to be distinguished from ruptured tubal pregnancy. In chronic inflammatory cases, the tubal wall is markedly fibrotic and serosal adhesion is prominent. The inflammatory exudates often spread to the ovary, resulting in the formation of a tubo-ovarian abscess and obliteration of the pelvic anatomic relationships. The rupture of such an abscess may lead to localized or generalized peritonitis and requires prompt surgical intervention.[16,17] Hydrosalpinx is generally regarded as the end stage of a purulent salpingitis in which pus has been reabsorbed and replaced by a transudate of plasma.[18] Pelvic inflammatory diseases are the generic term used for the inflammatory process of this region in which the fallopian tube is the epicenter and presumably the source of inflammation.[19-21] Eschenbach et al,[22] recovered Neisseria gonorrhoeae from 91 of 204 cases of acute pelvic inflammatory disease in patients with cervical gonococcal inflammation. Chlamydial infection is also common, accounting for over 20% and perhaps as many as half of the cases.[23,24] This etiology should be suspected in cases of chronic salpingitis accompanied by marked lymphoid follicular hyperplasia.[23]

Tuberculosis of the fallopian tube develops by the haematogenous route. In advanced cases, both tubes are replaced by caseous tuberculous masses, approximately 80% of cases.[25] Granulomatous inflammation of the tubes can also be produced by schistosoma, oxyuris vermicularis, actinomyces and other organism.[26] Sarcoidosis and Crohn's disease may be accompanied by tubal involvement. Foreign bodies introduced for diagnostic or therapeutic measures can induce bizarre granulomatous responses. Reaction to the lipoidal that used to be introduced in the Rubin's test may be so proliferative as to resemble a neoplasm. The push of a uterine sound may drive lubricant into the tube, causing lipoid granulomas.[27]

Xanthogranulomatous salpingitis is characterized by infiltrate of foamy histiocytes. Some authors make distinction between Xanthogranulomatous and Pseudoxanthomatous salpingitis is probably unwarrented.[28]

Accordingly, some authors pseudoxanthomatous salpingitis.[29] refer to it as Giant cell arteritis is occasionally found in the tube, ovaries and uterus of postmenopausal patients, either as an isolated finding (most frequently) or as a manifestation of a generalized immune mediated disease.[30]

Torsion of the fallopian tube and ovary is usually secondary to inflammation or tumor, but occasionally it develops in a previously normal organ, the appearance at surgery being that of a hemorrhagic infarct. This phenomenon can occur in ~ 38 ~ adults as well as in infants and children.[31,32]

Walthard cell nests are small, glistening, round collection of flat to cuboidal cells with the appearance of urothelium located on the tubal serosa,[33] sometimes accompanied by cystic changes. They are probably of mesothelial rather than mullerian or wolffian nature. They should not be mistaken for serosal implants in patients with ovarian neoplasm.

Para tubal cysts, traditionally known as hydatid cyst of Morgagni, are commonly seen as small round cysts attached by a pedicle to the fimbrial end of the tube. Their wall is paper thin and their content is clear. Occasionally, they attain a large size and may undergo torsion.[34] Most are lined by tubal columnar epithelium containing both ciliated and secretory cells, sometimes projecting in a papillary fashion into the lumen and covered by a thin layer of smooth muscle.[35] Their appearance is consistent with origin from mullerian-type structure. Other paratubal cysts, lined by flat cells and surrounded by a thin fibrous wall, are regarded as of mesothelial origin.[36]

Endometriosis frequently involves the tube in the form of nodules located in the wall or serosa.[37]

Decidual reaction of the tubal mucosa is a common finding in specimens of tubal ligation obtained at the time of caesarean section; it appears as small nodular collections of decidual cells covered by a flattened, sometimes inflamed epithelium. Similar changes have been documented following hormonal therapy.[38]

Arias-stella reaction can occur in the fallopian tube epithelium in association with either orthotropic or tubal pregnancy.[39]

The fallopian tube primary malignancy is extremely rare and accounts for less than 0.14% to 0.18% of all genital malignancies with an annual incidence of 3.6 per million woman. Metastatic carcinoma of fallopian tube appears to be more common. The fallopian tube malignancy possesses a diagnostic challenge as it is difficult to distinguish between primary ovarian and primary endometrial carcinoma with primary fallopian tube carcinoma.[5,6] Serous tubal intraepithelial carcinoma (STIC) is rare pathologic finding at the time of benign gynecologic surgery. It arises in the distal fimbrial end of the fallopian tube and likely represents a precursor lesion to high grade pelvic serous carcinoma. A putative non malignant precursor to STIC, termed the p53 signature, has recently been described in fallopian tube.[7] Traditionally primary carcinoma of the fallopian tube has been regarded as very rare, accounting for approximately 1% of primary genital tract malignancies.[40] However, several recent studies following a standardized grossing protocol observed that it reaches approximately 15% of all adnexal tumors,[41] including a fair number of early stages. The interesting possibility is that a high percentage of ovarian and primary peritoneal serous carcinomas may originate in the tubal fimbriae. Microscopically, all the major types of carcinoma known to occur in the ovary have been reported in the tube. The most common type is papillary serous carcinoma.[42] Borderline epithelial neoplasm has also been described in the fallopian tube.

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Fallopian tube is affected by a wide spectrum of diseases varying from salpingitis to carcinoma. As this is a common specimen in the surgical pathology laboratory, knowledge of the frequency of these various pathological lesions involving fallopian tube can be valuable to pathologists, who may identify an unusual histological finding.

MATERIALS AND METHODS

A total of 100 surgically resected specimen of fallopian tube of all age group of patients which are received from July 2021 to December 2021 are processed in the department of Pathology, JLNMC, Bhagalpur, Bihar, India with routine histopathological techniques. All poorly fixed specimens are excluded from the study. Minimum of two cross sections from proximal, mid portions and one longitudinal section from distal fimbriated end of each fallopian tube are taken for examination. Histopathological features were studied on Haematoxylin and Eosin stain and all microscopic features are noted down.

RESULTS

In our study the youngest patient was 11-20 years and eldest one was 71-80 years. Most of the patient's age is between 41-60 years. (Table.1) Maximum numbers of patient are from pre and post menopausal age group. However all cases of tubal gestation, maximum number of endometriosis and stromal decidual changes are from reproductive age group. Only two cases of granulomatous salpingitis are seen who are also from reproductive age [Table 2].

In our study most of the patients are in the post-menopausal age group (44%) and premenopausal age group (25.50%), Most of the patient's undergone total abdominal hysterectomy with salpingo-oophorectomy (60%) and few patients's undergone unilateral salpingectomy (10%). [Table 3] In our study most of the cases show unremarkable histology i.e., 31.50% and least number of cases show serous tubal intraepithelial carcinoma, high grade (0.50%) [Table 4] Most common histopathological findings observed are Para tubal cyst, ectopic tubal gestation and Walthard Cell Nests.

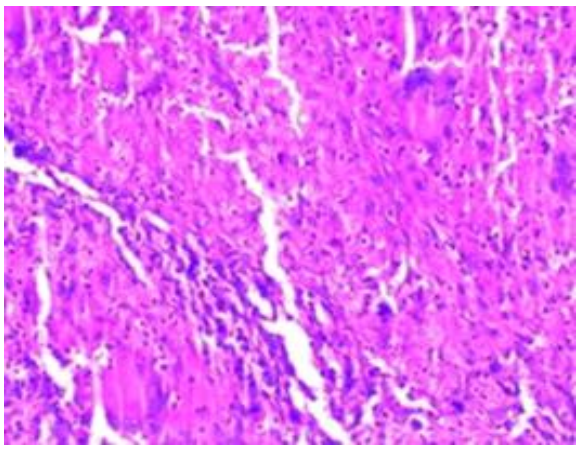

Figure 1: Granulomatous Salpingitis H&E (40x)

Figure 2: Cystic Walthard Cell Nest H & E (20x)

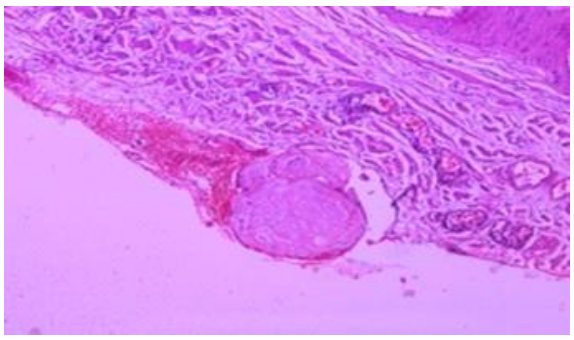

Figure 3: Stromal Decidual Changes H & E (10x)

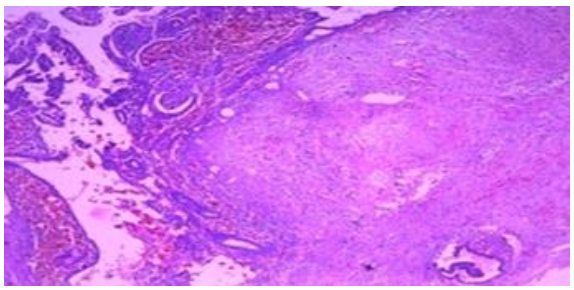

Figure 4: Endometriosis H & E (10x)

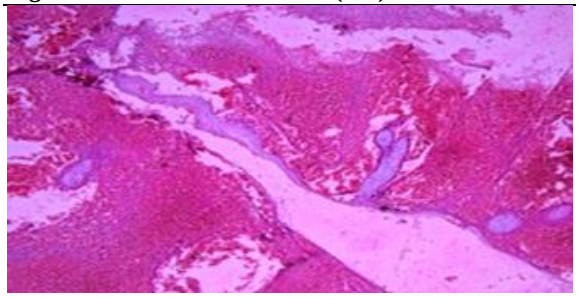

Figure 5: Tubal Gestations H&E (20x)

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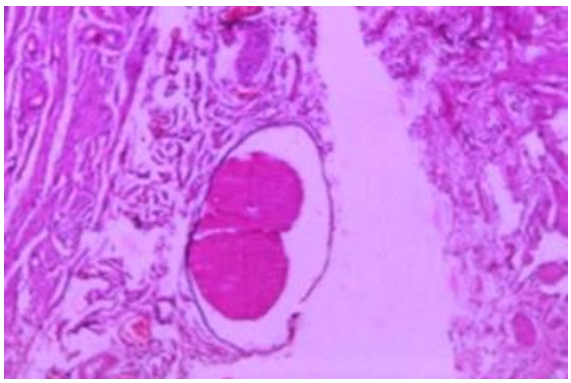

Figure 6: Mesothelial Cyst H&E (10x)

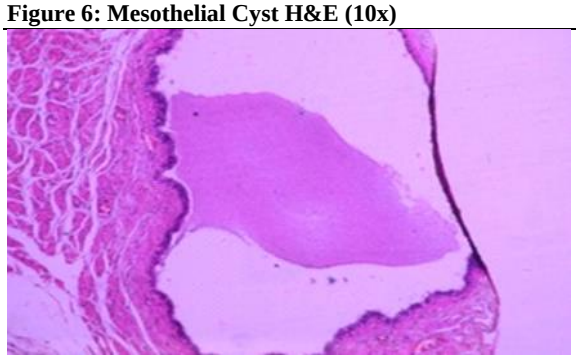

Figure 7: Paramesonephric Cyst H&E (20x)

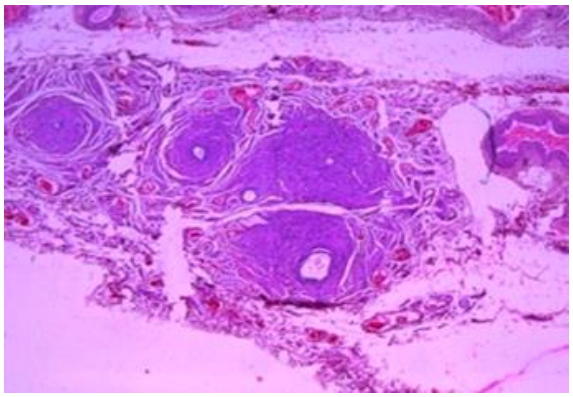

Figure 8: Mesonephric CYST H & E (10x)

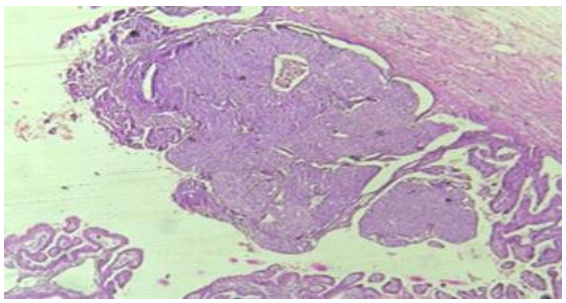

Figure 9: Serous Intraepithelial Carcinoma (Highgrade) H&E (20x)

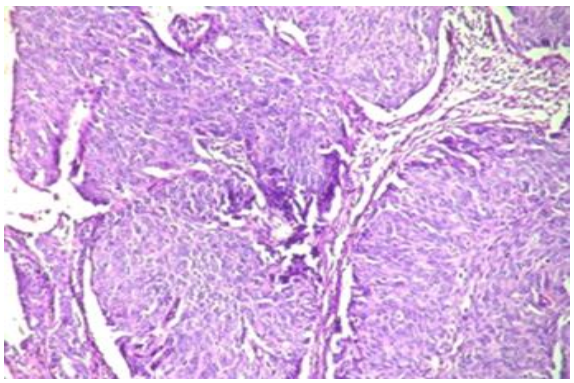

Figure 10: Serous Intraepithelial Carcinoma (Highgrade) H&E (40x)

Table 1: Shows distributions of total 100 cases according to their age-wise distribution of tubal lesions.

	11 - 20	21-30	31-40	41-50	51-60	61-70	71 - 80	Total	Percentage
Chronic Salpingitis	0	0	1	2	1	1	1	5	5%
Chronic Salpingitis with	0	0	0	0	1	0	0	1	1%
Walthard Cell Nest	0	0	2	4	2	1	1	10	10%
Cystic Walthard Cell Nest	0	0	1	1	1	1	1	5	5%
Stromal Oedema	0	0	1	2	0	0	0	3	3%
Epithelial Hyperplasia	0	1	1	1	0	0	0	3	3%
Stromal Fibrosis	0	0	0	1	0	0	0	2	2%
Hydrosalpinx	0	1	1	1	0	0	0	3	3%
Granulomatous Salpingitis	0	0	1	0	0	0	0	1	1%
Tubal Gestation	1	4	2	0	0	0	0	7	7%
Stromal Decidual Change	1	2	0	1	0	0	0	4	4%
Lymphatic Dilation and Presence of lymphoid Follicles	0	0	0	1	0	0	0	1	1%
Hematosalpinx	0	1	1	0	0	0	0	2	2%
Paramesonephric Cyst	0	1	1	3	1	1	0	7	7%
Mesonephric Cyst	0	0	1	2	1	0	0	4	4%
Mesothelial Cyst	0	1	1	1	1	1	0	5	5%
Endometriosis	0	1	1	1	1	1	0	5	5%
Serous Tubal Intraepithelial carcinoma- High grade	0	1	0	0	0	0	0	1	1%
Unremarkable	0	1	3	5	13	3	6	31	31%
Total								100	100%

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Table 2: Shows distribution of total 100 cases according to types of surgery.

Type of Surgery	Total Number	Percentage
Total Abdominal Hysteroctomy with Salpingo Oophorectomy	60	60%
Unilateral Salpingo – oophorectomy	15	15%
Unilateral Salpingectomy	10	10%
Tubal Ligation	15	15%
Total	100	100%

Table 3: shows distribution of total no of 100 cases according to their fallopian tube pathology.

Fallopian Tube Pathology	Total	% of Incidence
Chronic Salpingitis	5	5%
Chronic Salpingitis with Mucinous Metaplasia	1	1%
Walthard Cell Nest	10	10%
Cystic Walthard Cell Nest	5	5%
Stromal Oedema	3	3%
Epithelial Hyperplasia	3	3%
Stromal Fibrosis	2	2%
Hydrosalpinx	3	3%
Granulomatous Salpingitis	1	1%
Tubal Gestation	7	7%
Stromal Decidual Change	4	4%
Lymphatic Dilation and Presence of Limphoid Follicles	1	1%
Hematosalpinx	2	2%
Paramesonephric Cyst	7	7%
Mesonephric Cyst	4	4%
Mesothelial Cyst	5	5%
Endometriosis	5	5%
Serous Tubal Intraepithelial Carcinoma - High Grade	1	1%
Unremarkable	31	31%
Total	100	100%

DISCUSSION

Discussion The study conducted by Bagwan IN et al. (2004),[4] observed that majority of the cases belonged to the age group of 36 to 45 years. Gon S et al,[5] (2013) showed the same findings. In the present study majority cases are in the age group of 40 to 60 years.

According to the study conducted by Jennifer L. Hunt et al. 2002),[2] specimens of fallopian tubes received following tubal ligation and total abdominal hysterectomy with bilateral salpingo-oophorectomy in 38.62% of the cases each followed by salpingectomy and unilateral salpingo oophorectomy in 22.76% of the cases. According to Bagwan IN et al. (2004),[4] most common surgical procedure performed was total abdominal hysterectomy with bilateral salpingo-oophorectomy in 72.77% of the cases followed by salpingo-oophorectomy in 22.9% cases and tubal ligation in 4.24% cases. According to Gon S et al. (2013),[5] total abdominal hysterectomy with bilateral oophorectomy was done in 75.11% cases followed by salpingectomy in 14% cases, unilateral salpingo oophorectomy in 5.86% cases and tubal ligation in 5% cases. Prachi k et al,[43] showed tubal ligation was done in 51.5% cases followed by total abdominal hysterectomy with bilateral salpingo-oophorectomy salpingectomy 33% cases in salpingectomy 9% cases, unilateral salpingo oophorectomy in 3% cases, total abdominal hysterectomy with unilateral salpingo-oophorectomy in 2% cases and bilateral salpingo-oophorectomy in 1.5% cases.

In the present study, total abdominal hysterectomy with salpingo-oophorectomy done in 60% cases followed by unilateral salpingo-oophorectomy in 15% cases, unilateral salpingectomy in 10% and tubal ligation in 15% cases.

Most studies showed unremarkable histology. The present study also shows unremarkable pathology in a maximum number of cases (36.1%).

Study conducted by Jennifer L, Hunt et al,[2] observed that most common lesions were non-neoplastic, in which inflammatory lesions such as salpingitis was most common and seen in 32.5% of the specimens followed by tubal epithelial hyperplasia in 10.8% of the specimens. Bagwan IN et al,[4] also observed the most common lesions were non-neoplastic in which inflammatory pathology were the most common, seen in 18.34% cases. The inflammatory lesions were salpingitis (10.19%), hydrosalpinx (7.86%) and pyosalpinx (0.29%) of the fallopian tube.

Present study shows, chronic salpingitis 5% and chronic salpingitis with mucinous metaplasia in 1% of cases. Incidence of hydrosalpinx is 3% and hematosalpinx is 2% in this study.

Prachi et al,[43] and Bagwan IN et al,[4] found tubal epithelial hyperplasia in 1.34% and 0.29% of cases respectively. In our study, tubal epithelial hyperplasia is seen in 3% cases.

The study done by N Dahiya et al,[44] tubal ectopic pregnancy was commonly seen in the younger age group of 25-30 years. Shraddha Shetty K et al,[45] showed in 25-30 years and according to C. Li et al,[46] most common age group was 20-29 years. Our study shows 7.50% of tubal gestation in the age group of 21-30 years, which is almost same with other studies by N Dahiya et al,[44] and Shraddha Shetty K et al.[45]

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Study done by Pratima Kujur et al,[47] (2016) showed 0.54% of tuberculous salpingitis cases. Lakshmi et al,[6] observed almost equal incidence of tuberculous salpingitis (0.59%).

Primary genital tuberculosis is quite rare. The most common site of genital tuberculosis is fallopian tubes, accounting to approximately 5%. In our study, granulomatous salpingitis is seen in 2 (1%) cases. Agarwal and Gupta48 on their study of female genital tract found incidence of tuberculosis declining from 1.8% in 1974 to 0.8% in 1989. Epithelial tufting / Stratification / Hyperplasia (3.5%) are seen more with increased patient age. In our study it is in 3% of specimens. Our study is almost same as Hunt JL, et al. (2002).[2] Hunt JL, et al,[2] (2002) also found lymphoid follicles in 2.1%. of cases. In our study it is 1%.

Pratima Kujur et al,[47] (2016) observed in their study, the incidence of paratubal cyst in 11.35% of patients. Our study shows incidence of paratubal cyst is 7%. In this study endometriosis is seen 5% of the cases. The Incidence of endometriosis is slightly higher as compared to other studies. (Pratima kujur, et al. 2016).[47]

Other non neoplastic lesions are seen in this study are decidual reaction (4%), Walthard Nests (10%) and Walthard Nests with cystic change (5%) which are slightly higher than other studies done by Prachi Kukreja et al. (2017).[43]

Incidence of paratubal cyst (Para mesonephric cyst 7% Mesonephric cyst 4% and Mesothelial cyst 5%) which is almost same as studies done by Prachi Kukreja et al,[43] (2017) Mehnaz Choudhury et al,[49] (2019) and Pratima Kujur et al. (2016).[47]

In all the studies, neoplastic lesions of fallopian tubes were rare finding. In our study also, neoplastic lesion such as serous tubal intraepithelial carcinoma (high grade) is found in only 0.5% of patient.

CONCLUSION

Present study shows broad spectrum of pathological lesions nature. in fallopian tube. Majority of the lesions are non neoplastic in Neoplastic pathology is rare. Thorough histopathological examination of fallopian tube specimens is necessary to document many lesions including rare primary intraepithelial malignancy which can be missed clinically and found incidentally on histopathological examination.

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