

# Overview of Benign and Malignant Tumours of Female Genital Tract

Narula Ramesh, Arya Anjana, Narula Kusum, Agarwal Kiran, Agarwal Ashok, Singh Somdutt  
Rohilkhand Medical College, Bareilly (UP), India

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## ABSTRACT

Female genital tract is most common site for tumours in females. The most common type of female genital tract cancers are – cervical, ovarian and endometrial carcinoma. There are other less common tumours including tumours of vagina, vulva and fallopian tubes. The Uterine corpus represents the second most common site for malignancy of the female genital systems. Cervical carcinoma is the second most common cancer in women worldwide. Tumours of the ovary represent about 30% of all cancers of female genital tract. Cancer of the vagina is relatively rare, accounting for about 1%- 2% of gynaecological malignancies. Tumours of the fallopian tube are much less common than the corresponding ovarian neoplasms. In view of major importance of the subject, this review study was undertaken to understand the topic in a better prospective.

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## INTRODUCTION

Female genital tract is most common site for tumours in females. The most common type of female genital tract cancers are – cervical, ovarian and endometrial carcinoma. There are other less common tumours including tumours of vagina, vulva and fallopian tubes. (Blaustein's Pathology of the Female Genital Tract, 2002).

The Uterine corpus represents the second most common site for malignancy of the female genital systems. These neoplasms are divided into epithelial, mesenchymal, mixed epithelial and mesenchymal tumours and trophoblastic tumours. Endometrial carcinoma occurs predominately in developed countries and is frequently associated with obesity. Two major types are distinguished. (WHO; Tumours of the Breast and Female Genital Organs, 2003).

Cervical carcinoma is the second most common cancer in women worldwide. According to WHO classification tumours of cervix divided into three – squamous cell carcinoma, adenocarcinoma and other epithelial tumours. The incidence of cervical cancer, which is predominantly of the squamous cell type, has markedly declined in many developed countries, mainly due to cytological screening programmes. (WHO; Tumours of the Breast and Female Genital Organs, 2003).

Tumours of the ovary represent about 30% of all cancers of female genital tract. Carcinomas of surface epithelial-stromal origin account for 90% of these cancers in North America and Western Europe. In some Asian countries, including Japan, germ cell tumours account for a significant proportion (20%) of ovarian malignancies (WHO; Tumours of the Breast and Female Genital Organs, 2003).

Cancer of the vagina is relatively rare, accounting for about 1%- 2% of gynaecological malignancies. There are two main types of vaginal cancer; squamous cell cancer and adenocarcinoma. Squamous cell carcinoma comprises up to 85% of vaginal carcinoma. (WHO; Tumours of the Breast and Female Genital Organs, 2003).

The vulva is formed by the labia majora, labia minora, clitoris, mons pubis and the associated structures of the vestibule including the urethral meatus. Benign tumours of vulva including condyloma acuminatum and others. Squamous cell carcinoma is the most common malignant tumours of the vulva occurs predominantly in older age group. The prominent non-epithelial tumours are malignant melanoma and sarcoma botryoides. (WHO; Tumours of the Breast and Female Genital Organs, 2003).

Tumours of the fallopian tube are much less common than the corresponding ovarian neoplasms; however, histologically the same surface epithelial-stromal is recognized. Sex cord – stromal and germ cell tumours are rare. (WHO; Tumours of the Breast and Female Genital Organs, 2003).

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\* Corresponding Author

Dr. Narula Ramesh,

MS (ORTH), FAIMER, Associate Professor, Orthopaedics.

Rohilkhand Medical College, Bareilly (UP), India. Pin- 243006.

M-09719740866. E-mail- [rameshnarula55@gmail.com](mailto:rameshnarula55@gmail.com)

### Female Genital Tract Tumors Distribution

Jassawala *et al* (1984) studied female cancer incidence in Aurangabad city in Maharashtra. He observed that genital cancer predominated among females, the most common site being the cancer cervix (43.6%). Breast cancer (36.4%) came second in the order of frequency followed by cancer esophagus (12.5%) and stomach (9.8%).

Bokhman IaV, Nechaeva I D, (1986) analysed 40 cases of genital malignancies in Russian. Out of this 31 were ovarian tumours, 2 were cervical, 3 were vaginal and 3 were tumours of vulva. Most Embryonal rhabdomyosarcoma of the vagina or the vulva occurred in patient less than 4 years where as ovarian neoplasms (mostly germ and sex cord tumour) were observed at prepubertal and pubertal age.

Schraub S, Alauzet E, (1992) did the epidemiological study of gynecological and breast cancer in France. According to them Breast cancers are the most common form of cancer in women, accounting for about 30% of tumours (excluding skin cancers) followed by cancers of the uterine cervix, uterine body and the ovary.

Platz and Benda (1995) studied the female genital cancers in United State. Cancer of the female genital tract exclusive of breast cancer was estimated to be the third most common group of malignancies in women, excluded only by neoplasm of the breast and of the digestive system. They observed that squamous cell carcinoma was the most common invasive malignancy of the cervix (77.1%), vulva (74.4%), and vagina (70.8%). Adenocarcinoma was the most frequent malignancy in the uterine corpus (81.5%) and ovary (86.6%). Cervical carcinoma in situ accounted for 91.0% of all in situ cancer, 35.1% of vaginal cancers and 50.4% of vulval cancers. Although cancers of uterine cervix and the corpus uteri had shown decrease in the incidence and mortality there had been a slight increase in incidence of ovarian cancer between 1973 and 1989. An increasing number of adenocarcinomas were noted over the time. The decreasing frequency of squamous cell carcinoma (13%) may account for some of the relative increase in the adenocarcinoma percentage.

In the Delhi Cancer registry conducted under National cancer registry programme of Indian Council of Medical Research (ICMR) from (1990-96), a total of 52,078 cancer cases were registered. (50.3%) cases were males while 49.7% were females. In female cancer breast (21.31%), cervix (19.93%), ovary (6.33%) and Gall bladder (5.83%) and esophagus (2.83%) were five leading sites.

Prabhakaran and Prasad (1997) studied cancer pattern in Bangalore urban Agglomeration as conducted under National cancer registry programme of Indian Council of Medical Research (ICMR). They observed that among female cancer of cervix was the leading site followed by cancer breast, esophagus, oral cavity, ovary and stomach.

Dinshaw Nene *et al.* (1997) did population based rural cancer registry in Barshi, Paranda and Bhum areas in Maharashtra under the National Cancer Registry Programme of ICMR. According to this registry the leading site of cancer in females was

cancer cervix (50.7%) the most common site followed by cancer breast (15.1%), esophagus (4.2%), ovary (2.2%) oral cavity and stomach (1.4%). In female peak age group affected is 60-64 years. Nkyekyer K (2000) studied relative frequencies of gynaecological cancers in Ghana. He observed that cervical cancer was the commonest, constituting about 57.8% of gynaecological cancer, ovarian cancer, endometrial cancer, choriocarcinoma and vulval carcinoma followed in that order. The mean age for cervical carcinoma 52 years were significantly higher than those for ovarian carcinoma 46.4 years, but not significantly different from those for endometrial carcinoma (56.0 years). Chhabra S, Sonak M (2002) studied gynaecological malignancies in rural institute in India. They analysis that gynaecological malignancies comprised 42.5% of all malignancies in women. Cancer of cervix (33.3%) and breast (27.3%), constituted 60.6% of all cancers in women. Cervical cancer and ovarian cancer were the main gynaecologic tumours. Endometrial cancer was found only in 2% of all female genital malignancies. Most women aged between 35 to 49 years.

Sen U, Ramanakumar A V, (2002) did population based studied of cancer pattern in Eastern India. They analysis that in female, the most frequently reported malignancies were breast (22.7%), followed by uterine cervix (17.5%), gallbladder (6.4%) and ovary (5.8%). Sen U, Mandal S, (2002) studied cancer incidence in the Eastern India from the population based cancer registry in Kolkata (Calcutta), the capital city of the state of west Bengal, India, for the period 1998 – 1999. They observed that among the female, the most frequently reported malignancies were breast (22.7%), followed by uterine cervix (17.5%), gallbladder (6.4%) and ovary (5.8%).

Heinemann K, Thiele, Lewis M A, (2003) did cohort study on women's health in Germany. The incidence of benign gynecological tumours was calculated from the data of the cohort period. In cohort study 1676 benign tumours were observed. This lead to incidence estimated of 27.0, 18.6 and 23.3 per 100000 women – years of observation for all benign tumours of the uterus, ovary and breast respectively. Kyari O, Nqqada H, (2004) studied pattern and frequency of malignant tumours of female genital tract in North Eastern Nigeria. Out of 381 cases, cancer of the uterine cervix was the most common 70.5%, followed by ovarian cancer 16.3%, then cancer involving the uterus 8.5%.

Nwosu S O, Anya S E (2004) studied the relative frequency of malignant diseases of the female genital tract in Nigeria. They observed that cervix was the commonest site of malignant diseases (63%) followed by the endometrium ovary, vulva and vagina. The age of the patient varied with the type of cancer as follow- endometrium (54.8 years), cervix (51.9 years), ovary (40.4 years), choriocarcinoma (30.6 years). Rose GS, You W (2005) studied cancer pattern in women aged less than 25 years during period (1990 to 2002) under Automated Central Tumour Registry (ACTUR). According to this

registry most common primary site was ovary with 116 cases (46%), followed by cervix, with 108 cases (43%). The most common histological types were germ cell tumour (35%) for ovary, squamous cell (52%) for cervix, choriocarcinoma (18%) for uterus, and squamous cell (30%) for vulva and vagina.

You W, Dainty L A, (2005) studied epidemiology characteristics of gynecologic malignancies in patients less than 25 years in USA. They analyzed 251 cases. The most common primary site was ovary, with 116 cases (46%), followed by cervix, with 108 cases (43%). The most common histological types were germ cell (35%) for ovary, squamous cell (52%) for cervix, choriocarcinoma 18% for uterus, squamous cell (30%) for vulva and vagina.

### Cervix Tumors

Paymaster (1964) observed the distribution of carcinoma of female Genital tract in India. He noted that in India cancer occurred in much larger proportions in the uterus (particularly in the cervix in comparison with its occurrence in the breast. At Tata Memorial Hospital Bombay, cervix was found to be affected in 88% of patient with carcinoma of female genital tract and the body of uterus in 6% of patient; the ovarian, vagina and vulva were the seats of cancer in the remaining 6% of the group. Almost half of all cancers in Hindu women occurred in the cervix. This proportion was reversed in Parsi women in whom the cervix was affected in 19% of all those afflicted with cancer. Muslim women had a low but even distribution of cancer of cervix (21%). A high proportion of carcinoma of the ovaries had been recorded for the state of Kerala. Cowdry (1968) indicated that was a marked decrease in mortality rate from carcinoma cervix in New York, while these rates were extremely high in Germany and very low in Israel the predominant histologic type was squamous cell carcinoma. Saran *et al.* (1985) studied cancer pattern in Central U.P. They observed that the commonest site was buccal cavity and pharynx (34.6%). In females cervix had the highest percentage (22.98%). The most affected age group was 31-60 years with a peak at 41-50 years.

Howe (1986) studied International variations in the incidence of carcinoma cervix uteri. High frequencies were reported from Colombia, Brazil, and New Zealand and from the North West Territories and the Yukon in Canada. Jewesses had the lowest frequencies. Carcinoma of cervix uteri was associated with poor hygiene, early sexual intercourse, the amount of intercourse and then number of partners, large families etc. It is more common among lower socioeconomic groups and among prostitutes. Parkin *et al.* (1988) intimated the worldwide occurrence of new cancer cases. (All sites) for 1980 at 6.35 million cases. These are distributed almost equally between developed and developing countries. Out of these 7.3% women developed cervical carcinoma and another 9.0% developed breast carcinoma. There are substantial differences in the incidence of these 2 cancers indifferent geographical regions. While developed countries have a higher incidence of breast carcinoma (11.1%) than cervical carcinoma (3.1%), in developing countries it is the opposite, 11.1% cervical carcinoma and 6.9% breast carcinoma.

Vesterinen E, Forrs M, (1989) studied cervical cancer pattern in Finland: Out of 520 cases, 95 (18.3%) were pure Adenocarcinoma and 17 (3.3%) represented adeno-squamous tumours. The mean age was 58.9 years. Prabhakar A K (1992) studied the incidence of cancer of uterine cervix in Indian women. He observed that cancer of uterine cervix is highest as compared to other sites in women. The majority of factor related to cervical cancer are associated with sexual behavior. Seow A, Chia K S (1992) studied cervical cancer incidence in Singapore. They observed that age – standardized incidence of cervical cancer has decreased from 18.2per 100,000 female in 1968-72 to 16.2 per 100,000 in 1983-87, and its ranking among the most common female cancer has fallen from second to fourth place behind cancers of the breast, colon, rectum and lung. Cervical cancer incidence rates are in general highest among Indian women, intermediate in Chinese and lowest in Malays.

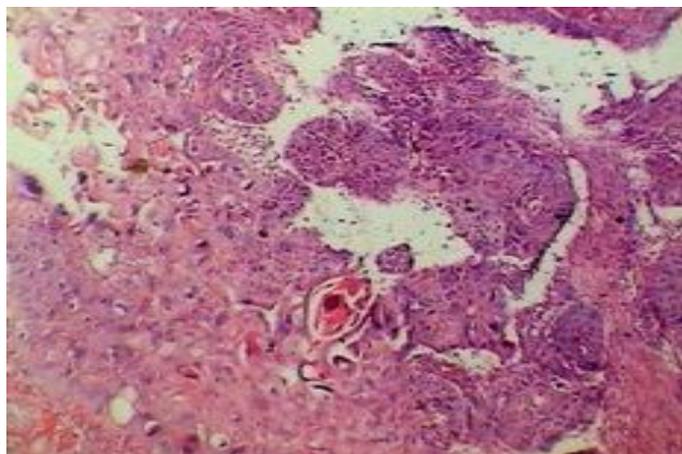
Gajalakshmi CK, Shanta V (1993) studied 4,995 cervical cancer cases were registered in the Madras Population-Based Cancer Registry at the Cancer Institute (WIA), Madras, India, in 1982-1990. They observed that peak incidence of carcinoma of the cervix was seen in the age group 55-59 years. Among cervical cancer patients, the incidence was significantly higher among illiterates and among those who had an education for 12 years or less than among those with over 12 years of education. The incidence of cervical cancer was low among Muslim women compared to Hindu and Christian women.

Nandakumar *et al* (1995) studied the incidence, and survival in cancer cervix in Bangalore, India. They observed that cancer of cervix was the most common cancer among females with an age adjusted incidence rate ranging from 19.4 to 43.5/1 lac in registries under National carcinoma registry programme. There were about 1 lac new case of carcinoma of cervix in India every year and 70% or more of these were stage III or higher at diagnosis. There were declining trends in incidence of carcinoma cervix in Bangalore possibly due to an increase in age at marriage amidst a changing socioeconomic environment. A low incidence of cancer cervix had been found on predominant Muslim population. Krishnamurthy S, Yecole B B (1997) studied the age adjusted incidence rates of pathologic type's cervical cancer from 1965 through 1990 in the population based Bombay cancer Registry and in the National cancer Registry's hospital –based frequencies of 1985-1987. They observed that in Bombay, the incidence rates of adenocarcinoma per 10 (6) women rose from 5.0 in 1965 to 12.9 in 1990. However, cervical cancers over all, declined, from 244 per 10(6) in 1965 to 176 in 1990. Squamous carcinomas declined from 167 to 129 per 10 (6), other types of cervical cancers declined from 10.9 to 2.9 per 10 (6) women. Adenocarcinomas were 2.5% of all cervical cancers in Bombay overall population in 1965 and were 7.0% in 1990.

Tiltman AJ (1998) studied that leiomyomas of the cervix are rare tumour. They analysed 661 total hysterectomy specimens macroscopically and microscopically. Myometrial leiomyomas were present in 427 uteri (64.6%) but cervical leiomyoma were present in only 4 (0.6%). Smith HO, Tiffany MF, (2000) studied

the incidence of cervical cancer in United States. They observed that the incidence of all cervical cancer and squamous cell carcinomas has continued to decline. However, the proportion of adenocarcinoma relative to squamous cell carcinoma and to all cervical cancer has doubled and the rate of adenocarcinoma per population at risk has also increased.

Nielsen GP, Young RH (2001) studied that leiomyoma is the most common benign mesenchymal tumours of the cervix. They observed that less than 2% of all uteri contain cervical leiomyoma, and that about 8% of uterine leiomyoma are primary in the cervix. Uzoigwe SA (2004) studied the prevalence of carcinoma of the cervix in Port Harcourt, River state. Out of 2,236 malignancies, 302 (13.5%) were malignancies of the genital tract while 188 (8.4%) were carcinoma of the cervix constituting 62.3% of female genital malignancies. Cervical cancer was commonest between the ages of 50 – 69 years. There was no patient with carcinoma of cervix below the ages of 20 years. Abnormal vaginal bleeding (84.1%) in pre and post –menopausal periods was the commonest presenting complaint. While squamous cell carcinoma (70.2%) and adenocarcinoma (14.9%) of the uterine cervix were the main histological types.



**Fig. 1:** Well differentiated squamous cell carcinoma of cervix showing keratin pearl (H & E 100x).

Murthy N S, Chaudhry K, Saxena S. (2005) studied the incidence of cervical cancer in India. They observed that cancer of the uterine cervix is commonest cancer. It is most common cancer among rate ranging from 60.9 to 65.4 amongst various registries. The age –specific incidence rates for cervical cancer revealed that the disease increases from 35 years and reaches a peak between the ages 55 to 64 years. It was also noted that most of the cervical cancer cases were detected with regional spread of the diseases and a very small proportion were diagnosed at a localized stage.

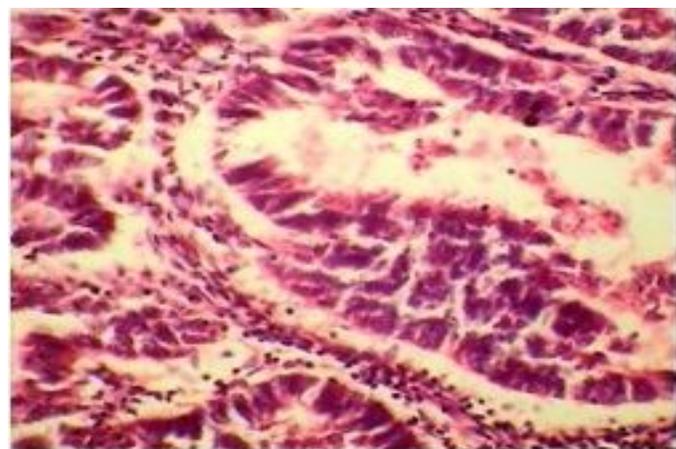
Kyndi M, Frederiksen K (2006) studied the incidence of invasive cervical cancer incidence in Denmark under Danish cancer Registry programme. They studied that there is significant reduction in incidence of invasive squamous cell carcinoma of cervix among women over 30 and incidence of invasive adenocarcinoma among women over 40. Women 20-29

years old showed a relatively stable squamous cell carcinoma incidence but an increasing adenocarcinoma incidence through out there study period.

## UTERINE CORPUS TUMORS

Cancer of the endometrium of the body of the uterus is the second most common malignant tumour of the uterus and the female genital tract. The peak incidence is in the mid 50's and there is also a strikingly high incidence in women who have not borne children. Kejjelgren O (1979) observed that endometrial cancer occur mostly in postmenopausal women. 20-25% cases may be seen in women in the perimenopausal age group and 2-5% occur on women less than 40 years of age. Mahboubi E, Eylar N (1982) did the epidemiological study of endometrial cancer. They observed that there is increase in endometrial carcinoma, while the incidence of cervical carcinoma has substantially decreased. Endometrial cancer is usually a diseases associated with postmenopausal women, mostly in 6<sup>th</sup> and 7<sup>th</sup> decades although rare cases have been reported in women under age 20 and over age 90. Cavanagn D, Marsden DE, (1984) observed that endometrial carcinoma is the most frequently diagnosed invasive neoplasm of the female genital tract in U S, and is third in incidence after breast and Colon cancer. The white population of the US has the highest age standardized incidence of endometrial cancer in the world, India and Japan have the lowest, and the European countries occupy intermediate positions. Between 75% and 80% of women diagnosed with endometrial cancer are postmenopausal and the mean age at diagnosis is about 60 years. Punnonen R, Lauslahti K (1985) analysed 44 cases of uterine sarcomas. Of the sarcomas, 35 (79%) were leiomyosarcomas, six (14%) endometrial stromal sarcomas and three (7%) endometrial carcinosarcomas.

Abeler VM, Kjorstad KE (1991) studied endometrial carcinoma in Norway. They observed that 1566 patients with adenocarcinoma of the endometrioid type out of which 469 patient (29.9%) had well differentiated tumours, 677 (43.2%) were moderately differentiated, 420 (26.8%) poorly differentiated tumour. Mean age of diagnosis was 62.1 years.



**Fig. 2:** Endometrioid adenocarcinoma showing back to back gland in histopathology (H & E x400).

Parazzini F, LaVecchia C (1991) did the epidemiological study of endometrial cancer in Negri, Milan, Italy. He observed that endometrial cancer rates were found to be higher in richer countries and urban populations. Shi YE, Xie X, Zhao CL (1994) studied forty-two cases originally diagnosed as uterine cellular leiomyomas were re-examined histologically. The results showed that among the 42 cases, there were 30(71.4%) cases of usual leiomyoma, 5(11.9%) cases of cellular leiomyoma, 1(2.3%) case of bizarre leiomyoma, 1(2.3%) cases of atypical leiomyoma, 2(4.2%) cases of tumors of uncertain malignant potential.

Tan YY, Ho TH, (1996) studied uterine cancer pattern in Singapore. They observed that out of 165 cases endometrioid adenocarcinoma was the commonest type of uterine cancer (75.2%), followed by adenoacanthoma (1.4%), adenosquamous carcinoma (1.4%), uterine sarcoma (11.5%), 6.7% had papillary serous adenocarcinoma and 3.0% had clear cell carcinoma. The median age of presentation of uterine cancer was 54.1 years and 10.9% of these cases occurred in those aged less than 40 years.

Bai P, Sun J (1997) analysed 153 cases of uterine sarcomas. Of the 153 cases, 48 were leiomyosarcomas, 47 mixed mesodermal sarcomas, 37 endometrial stromal sarcomas, 8 carcinosarcomas, 4 sarcoma botryoides, 1 fibrosarcoma, and 8 malignant lymphomas. Greven K M, Corn BW, (1997) observed that carcinoma of the uterine corpus remain the gynecologic malignant disease with the highest annual prevalence in the United States. The most common histologic type is adenocarcinoma. Risk factors that are strongly associated with the development of endometrial cancer included tamoxifen therapy, obesity and stimulation from unopposed estrogen. Aboyiji AP, Ijaiya MA (2002) studied to determine the incidence, of uterine leiomyoma at the University of Ilorin Teaching Hospital, Ilorin, Nigeria. They analysed five hundred and sixty-nine cases of uterine fibroid over a ten-year period. Uterine leiomyoma constituted 13.4% of gynaecological malignancies.

Akinyemi BO, Adewoye BR (2004) studied that fibroid is the commonest benign tumour of the female genital tract, it contributes about 70 to 80% of new growths in the female genital tracts, it is a cause of significant morbidity in women of reproductive age group and when complicated could be a significant cause of mortality. Amant F, Moerman P (2005) observed that each year, endometrial cancer develops in about 142,000 women worldwide and an estimated 42,000 women die from the cancer. The typical age incidence curve for endometrial cancer show that most cases are diagnosed after the menopause, with the highest incidence around the seventh decade of life.

Rammen – Rommani S, Mokni M (2005) did the epidemiological and pathological study of 2760 cases of uterine smooth muscle tumors. They observed that out of 2760 cases 12 are mitotically active leiomyomas, 18 are cellular leiomyomas, 20 atypical leiomyomas, 16 leiomyosarcoma, only one case of smooth muscle tumor of uncertain malignant potential. The 2709(98.1%) remaining tumors were all common leiomyomas. The average age of patient with leiomyomas was 39 years. The age of patient with leiomyosarcoma was 54 years.

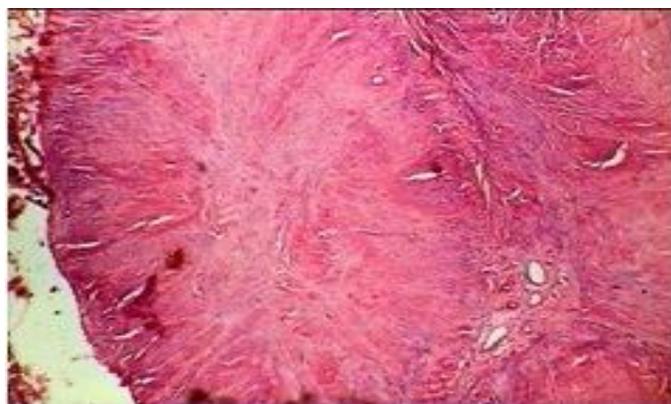


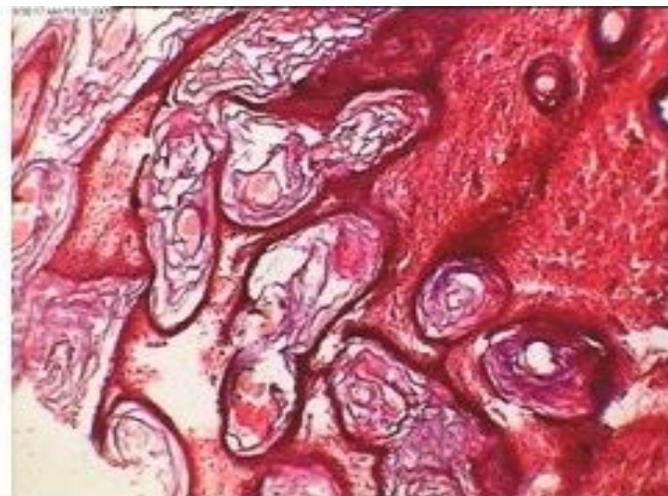
Fig. 3: Leiomyoma uterus in histopathology (H & E x100) (Benign tumour).

### Ovaries Tumors

Chitale (1978) studied 270 cases of ovarian tumors. Epithelial tumours comprise the commonest category (61.60%), followed by germ cell tumour (24.8%). The incidence of malignancy was 28.2%. Chakraborti (1989) analysed 372 cases of ovarian neoplasm (incidence was 1.29%). 74.2% were benign and 25.8% were malignant. In benign group 60.5% cases were in 21-40 years of age group. Among malignant ovarian tumours the highest number occurred in the age group over 40 years (77%).

Prabhakar BR (1989) studied prevalence of ovarian tumors in Punjab. They analyzed 636 cases. Of these serous tumors the commonest with 208 cases followed by mucinous tumours which formed the 2<sup>nd</sup> commonest group with 159 cases and teratoma which formed the 3<sup>rd</sup> commonest group with 142 cases. Out of 636 tumours, 420 were benign, 201 were malignant, and 15 were borderline malignancy. Gatphoh FD, Darnal HK (1990) studied ovarian neoplasm pattern in Manipur, India. They analyzed 158 cases of ovarian tumours. Out of these cases 118 (74.68%) cases were benign and 40 (25.32%) were malignant. Surface epithelial tumours were the commonest being 66.45%. Ovarian carcinoma constituted 12.88% of all malignant gynaecological diseases and it forms the second commonest gynaecological malignancy after carcinoma of cervix. The peak incidences of benign tumour were in the age group of 21 to 30 years while that of malignant tumour were in the age group of 31 to 50 years.

Nakashima (1990) studied 917 patients having ovarian tumors. Incidence of ovarian tumours was 57% of the total surgical specimens. Common epithelial tumours accounted for 56.6%, sex cord stromal tumours 7.3% and germ cell tumours for 39.5%. Mishra (1991) analysed 464 cases of ovarian neoplasm. 79.74% benign and 20.26% were malignant. On gross examination of 353 benign tumours 95.40% were cystic, 1.08% solid and 3.5% were mixed. In malignant tumours 69% were mixed, 15.95% were solid and 10.63% cystic. Mukherjee (1991) did the analysis of 285 consecutive cases of ovarian neoplasms. 63.5% were benign and 36.5% were malignant. Among benign group cystic tumour were most common. There were 34.9% of dermoid cysts, 31.5% of mucinous and 20.5% of serous cyst adenomas and 0.5-3.3% of different types of solid benign tumours.



**Fig. 4:** Dermoid cyst of Ovary showing keratin pearl in histopathology (H&Ex 400) .

Thanikasalam K, Ho CM (1992) studied pattern of ovarian tumours among Malaysian women at General Hospital, Kuala Lumpur. They observed 280 cases out of these 193 were benign, 81 were malignant, 6 cases belonged to borderline malignancy.

The teratomas were the commonest benign tumours among the Malays and Chinese. Serous cyst adenomas were the commonest among the Indians. The Malays had higher incidence of malignant epithelial tumours whereas the Chinese had a higher incidence of metastatic and germ cell tumours.

Tyagi SP, Maheswari V (1993) analysed 117 solid ovarian tumours received for histopathological examination in department of Pathology, J.N.M college, Aligarh. The overall incidence of solid ovarian tumor was 23.4% of all ovarian tumours. Of 117 solid ovarian tumours 19 (16.2%) were benign and rest 98 (83.8%) were malignant.

Epithelial tumours were the commonest (28.2%) followed by germ cell tumour (22.2%), sex cord stromal tumours (21.4%) metastatic tumours (19.7%) and non-specific tumours (8.5%). Chaudhary, Luthra (1996) analysed cancer of all sites among females. They found increased incidence of cancers of breast, ovary and lung among women and decreased incidence of cancers of esophagus, stomach and cervix.

Saygili U, Uslu T (1998) They analysed 21 cases of borderline ovarian tumour in Turkey from 1986 to 1996. Of these cases 33% were serous tumours and rest 66.6% were mucinous tumours. Out of these mucinous tumours 57.1% were the intestinal type and remaining 42.9% were the endocervical type. The average age was 45.4 ± 18.6 years.

Ahmad Z, Kayani N (2000) studied morphological pattern of benign and malignant ovarian neoplasm in Karachi, Pakistan. They analysed 855 ovarian tumours, 506 (59.18%) were benign and 349 (40.81%) were malignant. Surface epithelial-stromal tumours comprised 63.50% of all tumours. Benign cystic teratoma was the commonest benign tumour, (35.17% of all benign tumours) and serous cyst adenocarcinoma was the commonest malignant tumour (33.33% of all malignant tumour).



**Fig. 5:** Serous Adenocarcinoma of Ovary showing- closely packed papillae in histopathology. (H&E x100).

Pilli GS (2002) analysed 282 cases of ovarian tumours specimen received in pathology department of JN Medical College, Belgaum, India. Out of these cases 212 (75.2%) were benign, 8 (2.8%) of borderline malignancy and 62 (21.9%) malignant. Epithelial tumours were the commonest variety constituting (70.9%) of all the ovarian tumours followed by germ cell tumours (21.2%), sex cord stromal tumours (6.7%) and metastatic tumours (0.7%). Among the individual tumours, serous tumours (42.9%) were the commonest, followed by mucinous tumours (25.5%), teratomas (17%), granulosa cell tumours (6.7%), dysgerminomas (2.48%) and endodermal sinus tumours (1.77%). Two cases (0.7%) of endometrioid carcinoma and one case (0.3%) of clear cell carcinoma were also reported. Ovarian tumours were found to occur in the age range of 8 months to 74 years. Peak incidence was between 21 to 40 years age group.

Yada- Hashimoto N (2003) analysed 64 cases of metastatic ovarian cancer. Out of these cases 26 originated from gynecologic organs and 38 from non-gynecologic organs. Gynecologic primary sites were the uterine body (23%), uterine cervix (14%), and fallopian tube (3%). 8 of 9 cervical cancers with ovarian metastasis were adenocarcinoma. Among 38 cases of metastasis ovarian tumors from non-gynecologic organs, krukentberg tumours were 11 (29%) cases.

Quirk JT, Natarajan N (2005) did the epidemiological study of age adjusted ovarian cancer incidence in United States. They analysed 23,484 ovarian cancers. The overall, age-adjusted incidence rate if all ovarian cancer cases were 16.23 cases per 100,000 women. Epithelial tumour displayed the highest age-adjusted incidence rate (15.48), followed by germ cell tumours (0.4), sex cord-stromal tumours (0.20), and all other miscellaneous ovarian tumour (0.13). Serous epithelial tumours were the most commonly observed epithelial group (6.77) cases per 100,000 women, followed by other miscellaneous epithelial tumours (3.76), mucinous epithelial tumours (2.22), endometrioid epithelial tumours (2.11), and clear cell epithelial tumours (0.64). Chiangmai WN (2006) He analysed 170 cases of metastatic

tumours of ovary received for histopathological examination of Chiang Mai University, Thailand. Out of 170 cases, 117 cases with non-gynaecological origin and 53 cases with gynaecological origin. Non-gynaecologic metastatic tumours were from large intestine (31%), stomach (14%), intrahepatic bile duct (10%), breast (9%), extrahepatic bile duct/gall bladder (7%), appendix (5%), hematologic tumours (3%), other (4%) and unknown primary site (16%). Metastatic gynaecologic tumours were from cervix (53%), corpus (34%), fallopian tube (11%) and gestational trophoblastic diseases (2%). The majority of mucin producing adenocarcinoma involving the ovaries was metastatic tumours.

### Vagina Tumors

Daw E (1971) studied that squamous cell carcinoma comprises upto 85% of the vagina carcinoma and account for 1-2% of all malignant tumours of the female genital tract. The mean age of patient is about 60 years. Herbst AL, Robboy ST (1974) studied that adenocarcinoma has a peak incidence between 17 and 21 years of age. Clear cell adenocarcinomas are rare type and occur in patient less than 30 years of age, who have a history of in utero exposure to diethylstilbestrol.

Gerbie M V (1983) observed that primary carcinoma of the vagina is relatively rare. Metastatic lesions arising from the endometrium are common and extension from cervical or vulver tumours can also affect the vagina. Adenocarcinoma related to diethylstilbestrol exposure in utero is recently recognized type of vagina lesion and sarcoma occurring rarely in the vagina. Sulak P, Barnhill D (1988) studied prevalence of non-squamous cancer of the vagina in Bethesda. There are 48 cases of primary vagina cancer. Out of these cases (9) were adenocarcinoma, (1) were sarcoma, (3) were melanoma, (2) were adenosquamous, (1) were lymphoma and one were carcinoid tumour. The remaining 27 cases are of squamous cell carcinoma. Non-squamous cancer of the vagina occurred in patients at an earlier age than squamous cell carcinoma.

Manetta A, Gutrecht EL (1990) analysed 53 women with invasive carcinoma of the vagina who were seen at the University of California Irvine Medical Center, Long Beach Memorial Medical Center, and Saddleback Memorial Medical Center from 1976-1988. Forty-seven (89%) had squamous cell carcinoma and six (11%) adenocarcinoma.

Merino M J (1991) observed that primary cancers of the vagina are rare. They comprise 1% to 2% of all gynecologic malignancies and occur predominantly in older women. The diagnosis of primary carcinoma of the vagina requires that the cervix and vulva be intact and that no clinical evidence of other primary tumour exist. Approximately 90% of all vaginal tumours are squamous cell in type on histological examination. Adenocarcinoma, which is much less common (2% to 4%), is seen primarily in younger women with in utero exposure to diethylstilbestrol, other environmental factors have been associated with the developments of vaginal tumours, including chronic irritation from pessaries, previous hysterectomy from benign disease, immunosuppression therapy, cervical irradiation

and endometriosis. The two agents most often implicated are herpes simplex virus and human papillomavirus.

Creasman WT, Phillips JL (1998) studied vaginal cancer pattern in USA. They observed that during 1985-1994, 4885 cases of vagina cancer submitted to National Cancer Data Base. More than 90% were epithelial neoplasm with approximately 25% of these in situ lesions only. squamous carcinoma was more common as the age of the patient progressed. Adenocarcinoma represented nearly all the carcinoma in the group of patient age < 20 years and were observed less frequently with advanced stage. Goodman A (1998) observed that vaginal cancer were 2% of all female genital malignancies, has a worse prognosis than cervical cancer. Squamous cell carcinoma, the most common histological subtype, may be associated partly with human papilloma virus.

### Vulva Tumors

Benign tumors of the vulva, although relatively uncommon, are often referred to dermatologists for evaluation and treatment. The clinical features of benign tumors may overlap with malignant neoplasms, and therefore, a biopsy is often necessary to make a definitive diagnosis. (Haley JC, Mirowski GW, 1998). Sturgeon SR, Kurman RJ (1992) studied that squamous cell carcinoma is the most common malignant tumour of vulva. Primary squamous cell carcinoma of the vulva occurs most frequently in the older age group. The incidence rates are 1:100000 in younger women and 20:100000 in the elderly women. Pengsaa P, Pothinam S (1993) studied vulvar cancer pattern in Srinagaend Hospital, Khem Kaen University, Thailand. They analysed 65 cases of primary vulva cancer out of this 60 cases were squamous cell carcinoma, large cell non-keratinizing type, 2 (2.9%) of squamous cell carcinoma, large cell keratinizing type, 2 (2.9%) of adenocarcinoma, 1 (1.4%) of basal cell carcinoma and 1 (1.4%) of malignant melanoma. Aartsen EJ, Albus-Lutter CE (1994) observed 47 cases of vulvar sarcoma. Out of these, (15) cases were rhabdomyosarcoma, (10) cases were leiomyosarcoma, (5) cases were malignant fibrous histiocytoma, (8) cases were epithelioid sarcoma and (9) cases were dermatofibrosarcoma protuberans.

Newton WA (1995) studied that rhabdomyosarcoma occurs in the exclusively in children younger than 10 years of age. Popovici A, Mituescu G (1996) studied 50 cases of vulvar carcinoma. Out of these, 46 (92%) cases were squamous carcinoma, 2 were adenocarcinoma and 2 were fibrosarcoma. The age of patients varied from 36 to 85 years old with a media of 59.4. The localisations of the lesions were: 42 (84%) on the major labia; 7 on the minor labia; 1 on the clitoris and 1 on the Bartholin's gland.

Rosen C, Malmstrom H (1997) studied 328 cases histologically confirmed primary invasive cancer. Out of these, 300 cases (91.5%) had squamous cell carcinomas and they were classified according tumor differentiation as follows: well differentiated, 107 (36%); moderately differentiated, 129 (43%); poorly or undifferentiated, 45 (15%); and in 19 cases (6%), tumor differentiation was not available. Piura B, Rabinovich A

(1998) studied that vulvar carcinoma accounts for 4.9% of all female genital tract malignancies in the south of Israel. The most common histologic type is squamous cell carcinoma (82%).

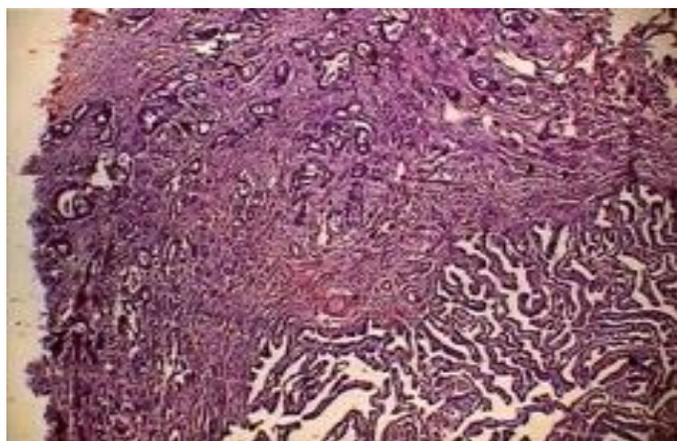
Hopkins MP, Nemunaitis –Keller J (2001) studied that squamous cell carcinoma of vulva account for 95% of all malignant tumours of the vulva. Mean age of diagnosis was 60-74 years.

Bienkiewicz A, Gottwald L (2002) studied that vulvar cancer has a low frequency (4-5%) compared to other genital cancers. They analysed 105 women with a primary malignant vulvar disease in the years 1991-2002. In the group there were 82 invasive tumours (80 squamous and 2 solid) and 23 intraepithelial cancers. The mean age in the group of intraepithelial cancer was 53.2 +/- 13.2 years, and in the group of invasive disease 65.0 +/- 11.7 years.

Door A (2002) studied that vulvar and vaginal cancers, sex cord-stromal tumors of the ovary, and gestational trophoblastic tumors are malignancies constituting less than 5% of rare all malignant diagnoses. If detected early these malignancies have a high possibility of cure. Ciszko B, Gabrys MS (2005) studied that vulva carcinoma account for 3-5% of all genital cancer. The most common histological type of vulvar cancer is squamous carcinoma.

### Fallopian Tube Tumors

Finn WF, Javent (1949) studied that 89 % of secondary carcinoma in tubes were of ovarian origin and remaining from endometrium. Woodruff JD, Julian CG (1969) studied that metastatic tumours involving the tube usually are the result of secondary spread from carcinoma of the ovary or endometrium.



**Fig. 6:** Mucinous cystadenocarcinoma ovary metastasis in fallopian tube in histopathology (H&E x100)

Mazur MT, Hsueh S (1984) studied that secondary tubal invasion by carcinoma of ovary and uterus is much more common event than primary tubal carcinoma. Most metastasis to the tube originated from genital organs. Soundara Reghavan S, Ramdas Chadaqa P (1991) analysed 9000 gynaecological malignancies, out of which only 9 cases of tubal carcinoma were found in a period of 20 year studied in JIPMER Hospital Pondicherry India.

Liapis A, Michailidis E (2004) studied that primary fallopian tube cancer is the rare of all gynaecological cancer. Primary adenocarcinoma is the most common histological type of primary tube cancer. Ajith Kumar TV, Ashok kumar OS (2005) studied that primary fallopian tube cancers constitute 1% of gynaecological malignancies. Early clinical manifestation and prompt investigation lead to diagnosis in early stage of diseases accounting for a better survival compared with ovarian cancer.

Kietpeerkool C (2005) studied that primary fallopian tube carcinoma accounted for 0.48% of all gynaecological malignancies in Thailand. The mean age at diagnosis was 53 years. He observed that out of 27 cases serous adenocarcinoma was 70.4% followed by endometrioid adenocarcinoma 22.2%, undifferentiated adenocarcinoma 3.77% and carcinosarcoma 3.7%. Singhal P, Lele S (2006) observed that primary carcinoma of fallopian tube is rare tumour. The mean age of diagnosis was 56 years. The most common histological type was adenocarcinoma. Out of 35 cases 16(46%) cases are adenocarcinoma.

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