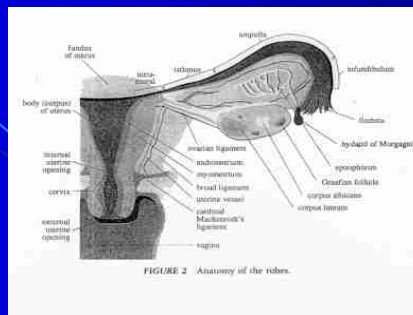


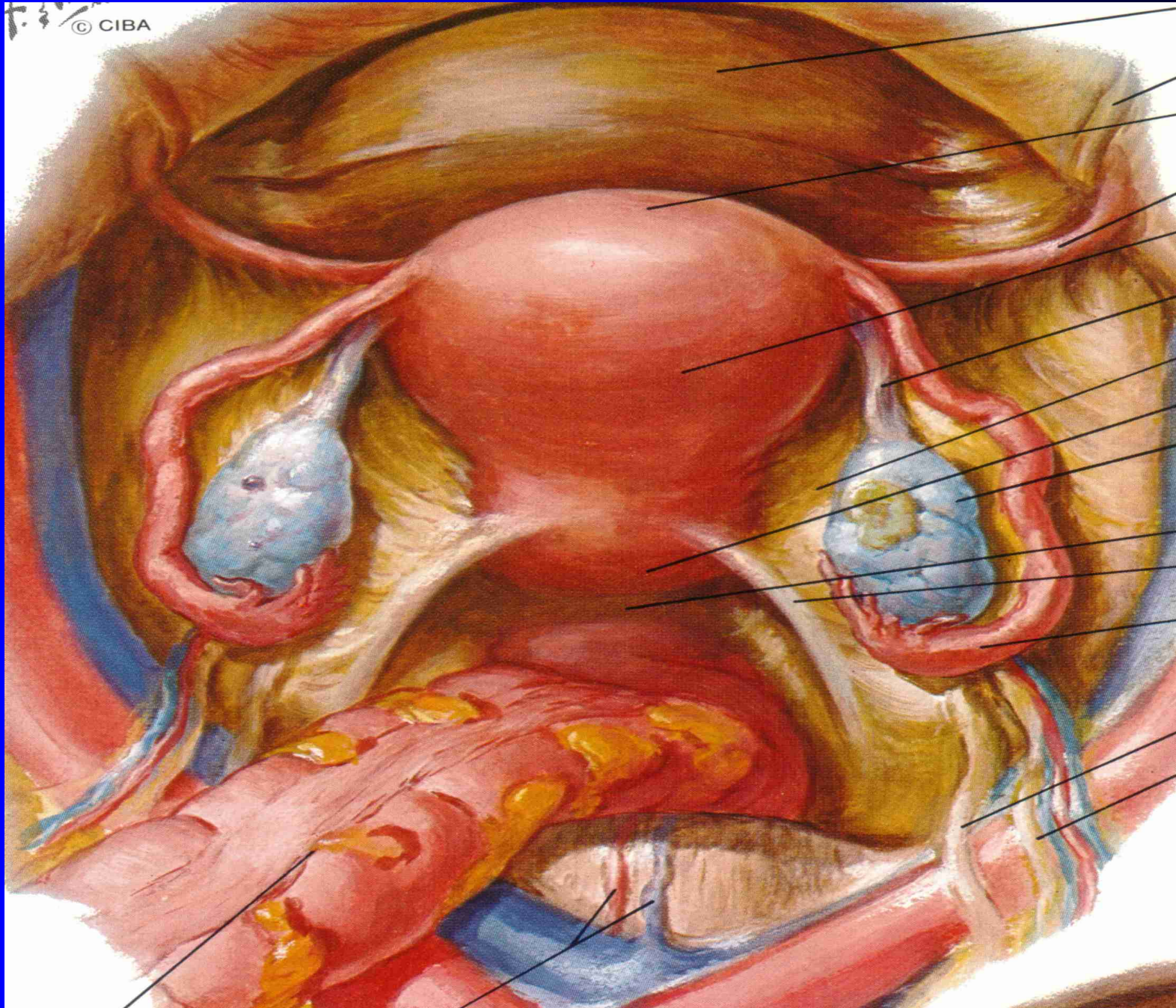
Fallopian Tube Cancer

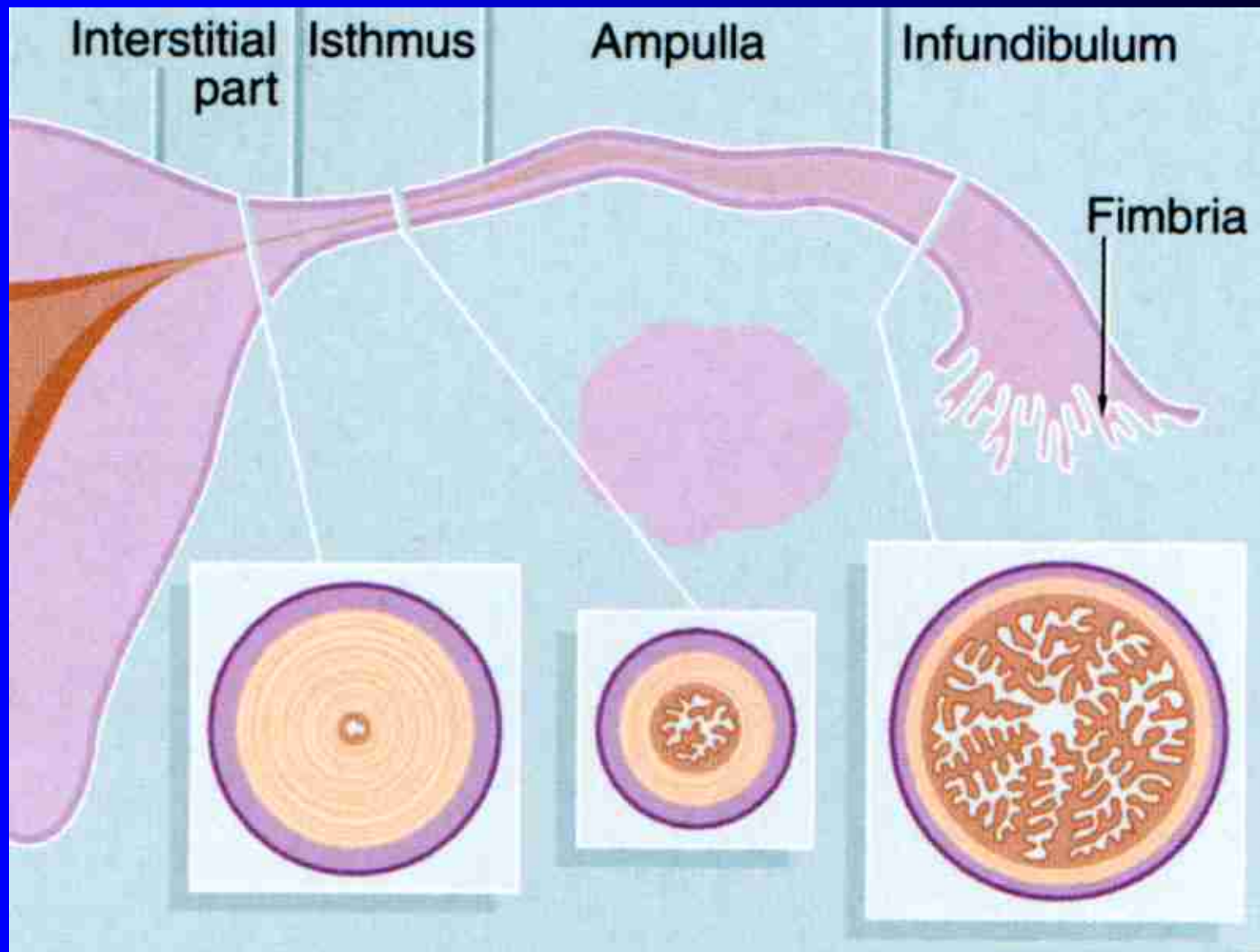


Fred Ueland, MD

University of Kentucky
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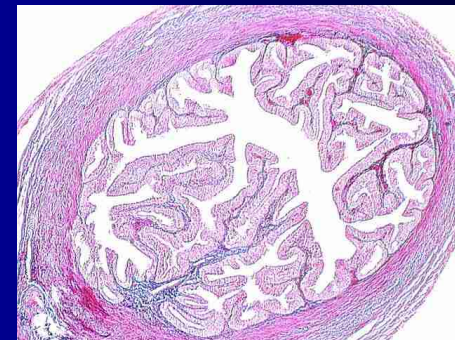
Anatomy

Three layers of the fallopian tube:

- Internal mucosa (endosalpinx)
- Intermediate muscular layer (myosalpinx)
- Outer serosa, peritoneum of the broad ligament and uterus (mesosalpinx)

Tubal mucosa:

1. The endosalpinx has primary folds, increasing in number toward the fimbria
2. Lined by columnar epithelium of three types:
 - o Ciliated
 - o Secretory
 - o Peg cells.



Benign Tubal Neoplasms

- Adenomatoid tumors
- Leiomyoma
- Teratomas
- Fibroma
- Fibroadenoma
- Papilloma
- Lipoma
- Hemangioma
- Lymphangioma
- Mesothelioma
- Mesonephroma

Pre-invasive Disease

- Carcinoma in situ (CIS)
- Papillary endosalpingeal lining with cytologically malignant, mitotically active nuclei
- Intact basement membrane
- Often incidental finding at segmental salpingectomy
- BSO recommended
 - Fertility is not an issue if recent sterilization

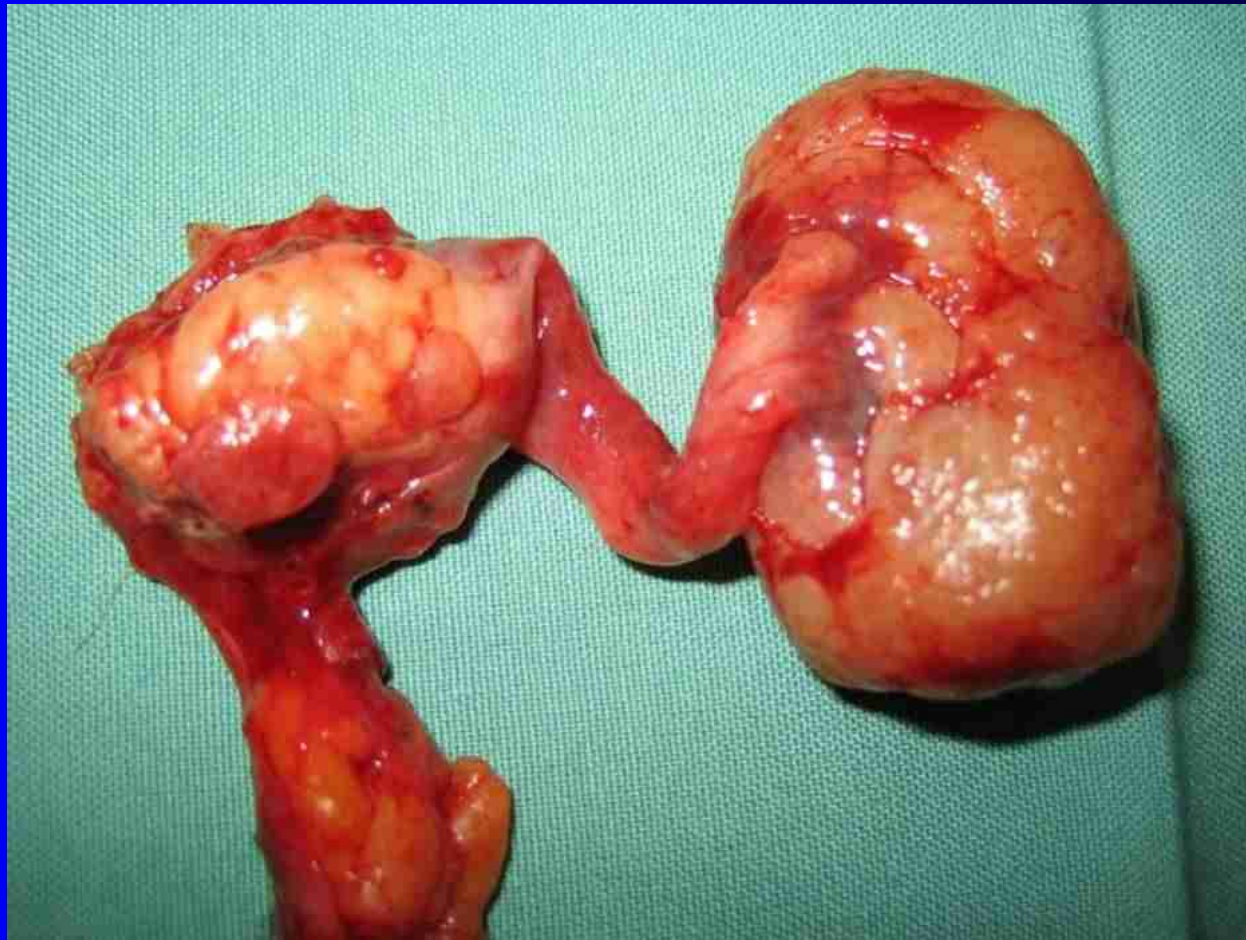
Primary Tubal Malignancies

- Adenocarcinoma
- Sarcoma
- Choriocarcinoma
- Other
 - Metastases to tubes are common

Fallopian Tube Cancer

- One of the rarest malignancies of the female genital tract
 - 0.3% of all gyn malignancies
 - 3.6 per million women
- Mean age at diagnosis in the 50's
 - $\frac{2}{3}$ are menopausal
- Risk factors
 - Nulliparity
 - Chronic salpingitis
 - Infertility
 - 70% of cases

Fallopian Tube Cancer



Presentation

- Delay of diagnosis common
 - Only 6% were actually asymptomatic
 - 23% with (+) cervical cytology, including psammoma bodies
- Triad
 1. Vaginal bleeding
 - Present in more than 50%
 - Postmenopausal bleeding, (-) D&C
 2. Hydrops tubae profluens
 - Colicky pain
 - Profuse serosanguinous vaginal discharge
 3. Adnexal mass

Age Distribution

FIGO Report, J Epidemiol Biostat 3:99, 1998

Diagnosis

- Preoperative diagnosis is rare
 - 80% have known pelvic or abdominal mass noted before surgery
 - 10-25% have cancer on cervical cytology
- Sonography
- Serum CA-125
 - London Trial, 20% of cancers detected were fallopian tube cancers
 - 25-fold greater than expected

Pathology

- Almost exclusively adenocarcinoma
 - Endometrioid
 - Papillary serous
 - Clear cell
- 10-25% bilaterality
- Peritoneal disease common before ovarian spread
- 87% stain for CA-125
- Propensity for lymphatic spread

Pathology

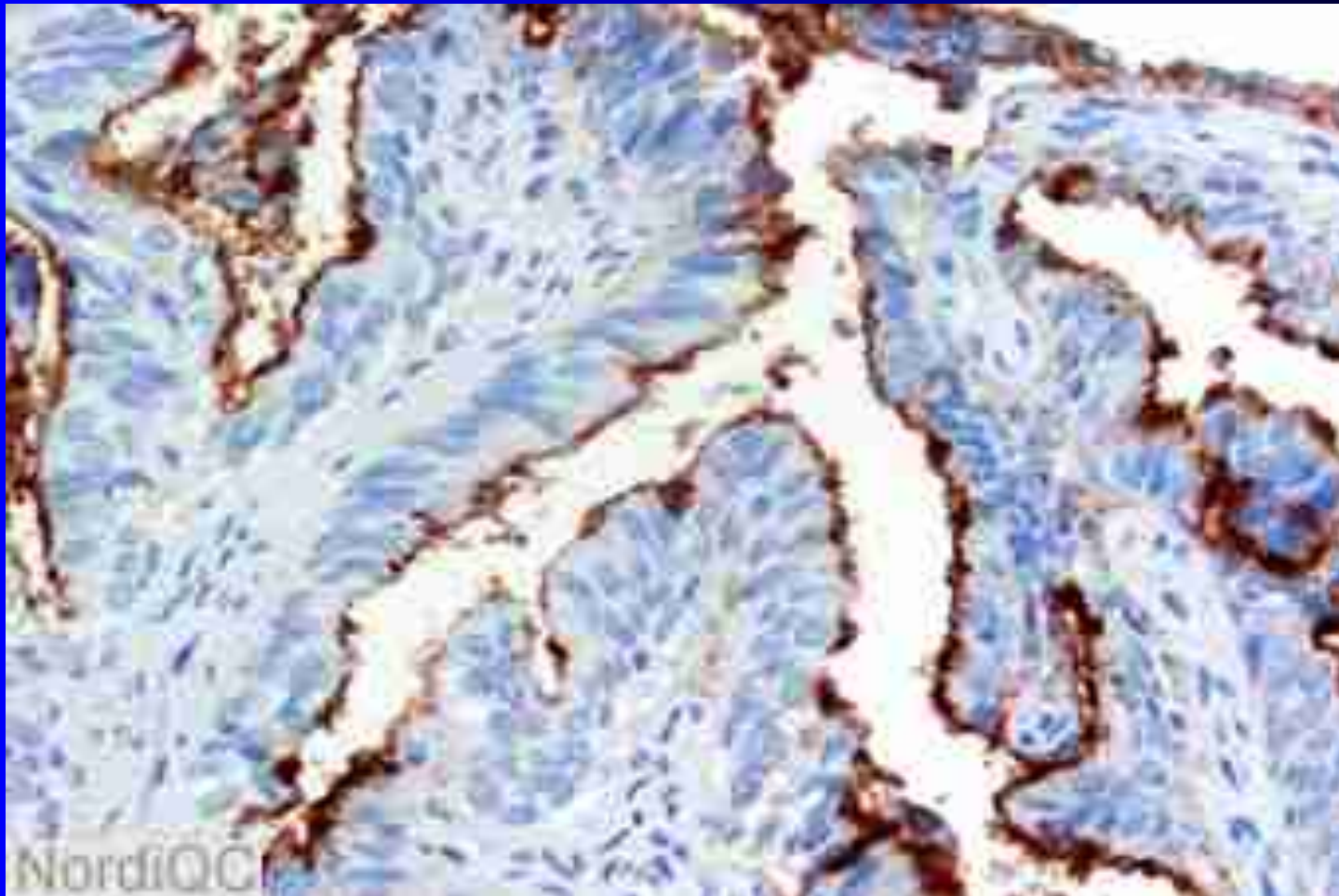
1. Main tumor should be visualized in tube
2. Tubal mucosa should be involved with a papillary pattern with histologic characteristics of the endosalpinx.
3. If the tubal wall is involved, transition from benign to malignant tubal epithelium should be demonstrated

Hu, AJOG 1950

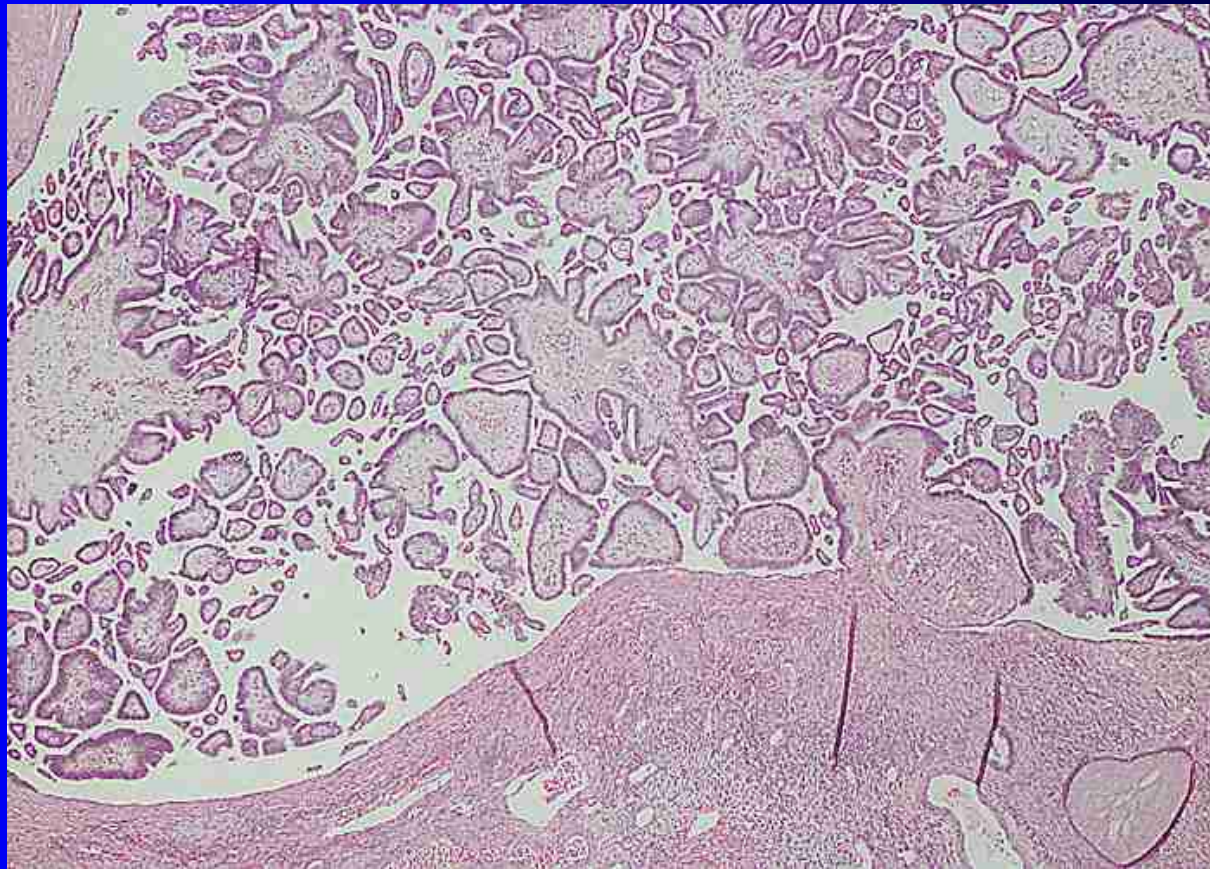
CA-125 Staining



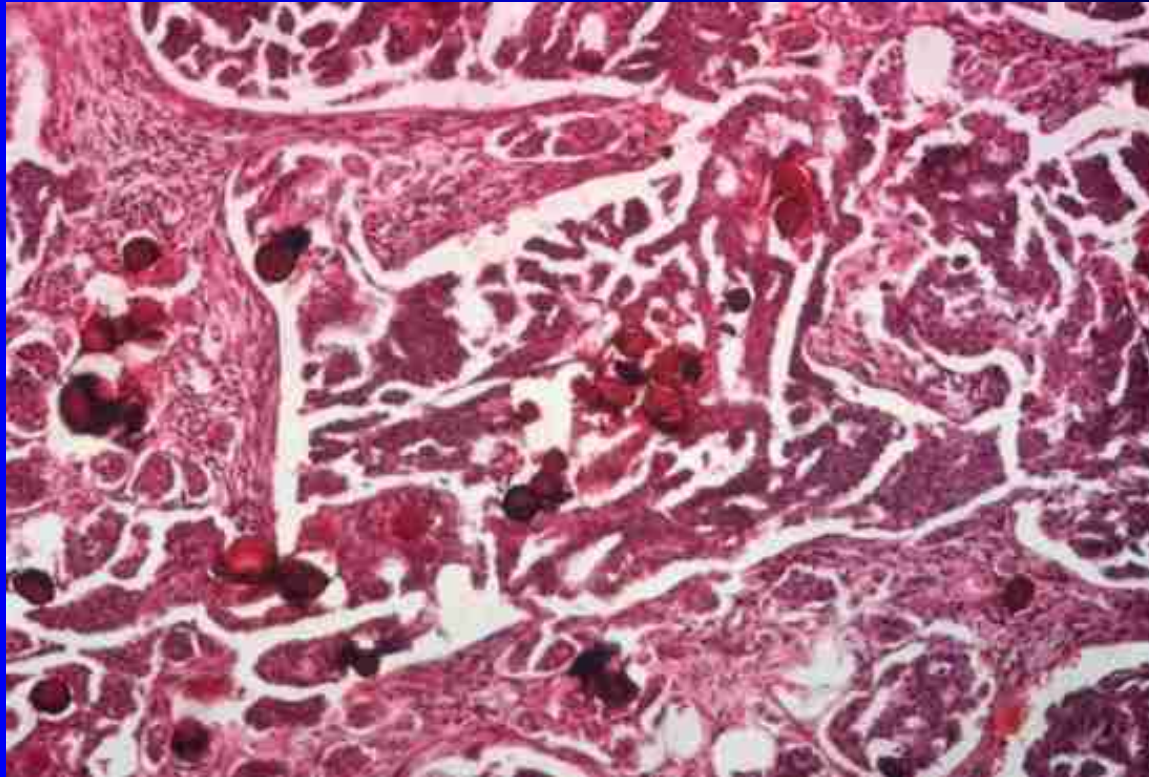
Fallopian Tube Epithelium



Low Malignant Potential



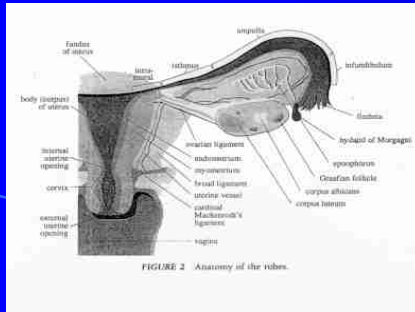
Serous Cancer



Fallopian Tube Cancer

Genetics

- Similar to ovarian and endometrial cancers
- Oncogenes
 - K ras, c-crb, erb b2
- Tumor Suppressor Genes
 - p53



Staging

FIGO established tubal carcinoma staging system in 1991

Stage I

Confined to Fallopian Tubes

- Stage IA: Confined to one tube
- Stage IB: Both tubes
- Stage IC: One or both tubes and:
 - Involvement of tubal serosa
 - Malignant ascites
 - (+) washings from the abdomen/pelvis

Stage II

Confined to Pelvis

- Stage IIA: Involvement of uterus or ovaries, or both.
- Stage IIB: Other pelvic tissue
 - bladder, sigmoid colon, or the rectum.
- Stage IIC: IIA or IIB with (+) washings, malignant ascites

Stage III

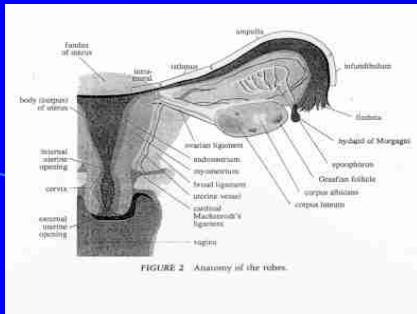
Extrapelvic Disease

- Stage IIIA: Microscopic disease of upper abdomen
- Stage IIIB: Upper abdominal involvement, but less than 2 cm in size
- Stage IIIC:
 - Lymph node involvement, inguinal included.
 - Upper abdominal disease ≥ 2 cm

Stage IV

Distant Spread

- Stage IV: Distant metastasis
 - Liver parenchyma
 - Lung parenchyma
 - Malignant pleural fluid
 - Other distant organs located outside of the peritoneal cavity



Surgery and Treatment

Fallopian Tube Cancer

Role Surgery

- Similar to ovarian cancer
- Proper staging for early disease
 - Adjuvant therapy
- Cytoreduction of advanced disease
 - Optimal $\leq 1\text{cm}$
- Reassessment laparotomy
- Secondary debulking

GOG Surgical Procedures Manual

- Adequate abdominal incision
- Estimate volume of peritoneal fluid. If no fluid, obtain washings from pelvis and abdomen if suspected stage I or II
- Inspect all peritoneal surfaces
- Infra-colic omentectomy
 - At minimum, a biopsy must be obtained

GOG Surgical Procedures Manual

- If possible, extrafascial TAH with BSO. Unilateral SO if patient desires fertility and cancer appears stage I
- Resect all remaining gross disease in abdomen pelvis
- Selective pelvic and para-aortic lymph node sampling
 - Not required if stage IIIc or IV, except for cytoreduction
- If no gross disease, perform peritoneal biopsies
 - Cul-de-sac
 - Vesical peritoneum
 - Right and left pelvic sidewalls
 - Right and left paracolic gutters
 - Right hemidiaphragm

Treatment

- Surgical staging as for ovarian cancer
- Data limited on fertility-sparing surgery
 - Potential for bilaterality
- Four studies show no benefit to adjuvant therapy in early stage disease
 - Under staging?
 - 50-60% survival for stage I/II
- Platinum-based combination chemotherapy

5-Year Survival

	I	II	III	IV	Overall
Podratz	64	60	81	25	41
Pfeiffer	64	40	6		37
Peters	61	29	17		
Muntz	100	63	-		
Frigerio	48	48	25		41
FIGO	84	52	36		

Overall Survival

1 year	2 year	3 year	4 year	5 year
87.8%	69%	60%	56%	56%

FIGO Report, J Epidemiol Biostat 3:99, 1998

N=83

Conclusions

1. Very rare gynecologic malignancy
2. Serous histology most common
3. Lymphatic and peritoneal spread
4. Staging and treatment similar to ovarian cancer
5. Optimal cytoreduction
6. Survival is similar to ovarian cancer



Review Questions



Review Questions

Genes and Cancer

1. Name the three main types of cancer protection genes.
2. Give an example of each type.



Review Questions

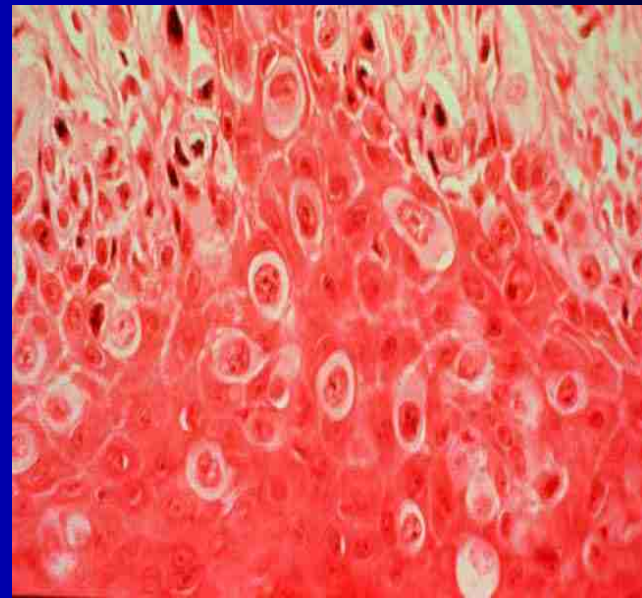
Genes and Cancer

1. Name the three main types of cancer protection genes.
2. Give an example of each type.
 - **Tumor suppressor genes**
 - RB (13q), p53 (17p), APC (5q21), BRCA1 (17q), BRCA2 (13q)
 - **Oncogenes**
 - Heregulin receptor (her-2/neu, erb-b), k-ras, h-ras, abl and src, EGF, PDGF, c-myc, cyclins
 - **mismatch repair genes**
 - MSH₂, MLH₁, MSH₆, PMS₁, PMS₂

Review Questions

Pre-invasive Disease of the Vagina and Vulva

1. What is the name of this condition?
2. What are the related clinical concerns?



Review Questions

Pre-invasive Disease of the Vagina and Vulva

1. What is the name of this condition?
 - Paget's disease of the vulva
2. What are the related clinical concerns?
 - Synchronous or metachronous adenocarcinomas of the breast and GI tract

Review Questions

Endometrial Hyperplasia and Hormone Therapy

1. Based on the WHI, estrogen-alone replacement therapy increases the risk of the following:

(True or False)

- Breast cancer
- Endometrial hyperplasia and cancer
- Stroke
- Improved cognition
- Fracture
- Thrombosis
- Death



Review Questions

Endometrial Hyperplasia and Hormone Therapy

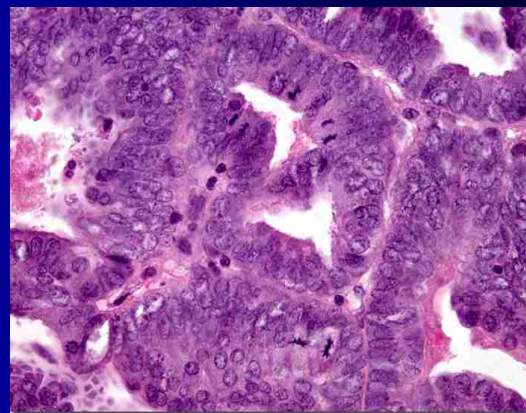
1. Based on the WHI, estrogen replacement therapy alone increases the risk of the following (*True of False*) :

- | | |
|---------------------------|---------------|
| ■ Breast cancer | No |
| ■ Endometrial hyperplasia | Yes (implied) |
| ■ Stroke | Yes |
| ■ Improved cognition | Yes |
| ■ Fracture | No |
| ■ Thrombosis | Yes |
| ■ Death | No! |

Review Questions

Adenocarcinoma of the Uterus

1. What are the top three causes of postmenopausal bleeding?
2. For type 2 endometrial cancer, discuss:
 - Typical body habitus
 - Common cell types and clinical course
 - Precursor lesion



Review Questions

Adenocarcinoma of the Uterus

1. What are the top three causes of postmenopausal bleeding?
 - ERT, atrophy, CA (Mayo → polyps then CA)
2. For type 2 endometrial cancer, discuss:
 - Typical body habitus
 - Normal BMI
 - Common cell types and clinical course
 - UPSC, clear cell, high grade, advanced stage, poor px
 - Precursor lesion
 - EIC (endometrial intra-epithelial carcinoma)

Review Questions

Uterine Sarcoma

1. Using the Ober Classification, discuss heterologous sarcomas of the uterus and give examples of each.



Review Questions

Uterine Sarcoma

1. Using the Ober Classification, discuss heterologous sarcomas of the uterus and give examples of each.
 - Pure
 - Rhabdo, chondro, osteo, liposarcoma
 - Mixed
 - Carcinosarcoma (MMT)

Review Questions

Invasive Cancer of Vagina and Urethra

1. To what lymph nodes do the following vaginal cancers drain?
 - Upper vagina
 - Middle vagina
 - Lower vagina



Review Questions

Invasive Cancer of Vagina and Urethra

1. To what lymph nodes do the following vaginal cancers drain?
 - Upper vagina
 - Pelvic lymph nodes (obturator and iliac)
 - Middle vagina
 - Both pelvic and inguinal lymph nodes
 - Lower vagina
 - Inguinal lymph nodes

Review Questions

The Adnexal Mass

1. What percent of unilocular cysts in postmenopausal ♀ will resolve in 6 months?
2. What percent of tumors whose TVS morphology index score is ≥ 5 will be malignant?



Review Questions

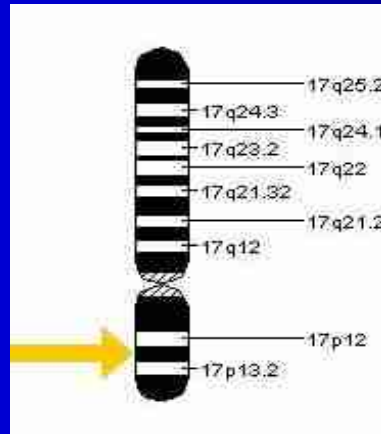
The Adnexal Mass

1. What percent of unilocular cysts in postmenopausal ♀ will resolve in 6 months?
 - 70%
2. What percent of tumors whose TVS morphology index score is ≥ 5 will be malignant?
 - 40%

Review Questions

Epithelial Ovarian Cancer

1. What are the three familial cancer syndromes in ovarian cancer?
2. What is the most common genetic abnormality in ovarian cancer?



Review Questions

Epithelial Ovarian Cancer

1. What are the three familial cancer syndromes in ovarian cancer?
 - Site specific, breast-ovary, Lynch-II
2. What is the most common genetic abnormality in ovarian cancer?
 - p53

Review Questions

Epithelial Ovarian Cancer

1. What are the NCCN guidelines for the initial treatment of advanced ovarian cancer after optimal cytoreduction?
2. What is a listed alternative to this initial treatment regimen?



Review Questions

Epithelial Ovarian Cancer

1. What are the NCCN guidelines for the initial treatment of advanced ovarian cancer after optimal cytoreduction?
 - IV Carboplatin and Taxol
2. What is a listed alternative to this initial treatment regimen?
 - Combined IV and IP Carbo/Taxol

Review Questions

Ovarian Germ Cell and Stromal Tumors

1. Answer the following regarding endodermal sinus tumor:
 - % of GCT
 - Clinical presentation
 - Tumor marker(s)
 - Recommended treatment
 - Overall survival

Review Questions

Ovarian Germ Cell and Stromal Tumors

1. Answer the following regarding endodermal sinus tumor:

- % of GCT 20%
- Clinical presentation 19 yo, pain, mass
- Tumor marker (s) α FP, α_1 antitrypsin
- Pathognomonic histo Schiller-Duval body
- Overall survival 70%