PATHOLOGY OF FALLOPIAN TUBE

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Epithelium secretes amylase

Tubo-ovarian abscess common

Isthmus (thick walled)

Intercalated (peg) cells which may be

Also post instrumentation, post-IUD, post-pregnancy or abortion

Acute salpingitis, suppurative salpingitis, pyosalpinx

Bacterial infection common, may cause infertility

Sexual transmission (Neisseria gonorrhoeae, Chlamydia, Mycoplasma) most common

Chronic salpingitis

Gross: enlarged distorted tube adherent to ovary; may be associated with hydrosalpinx or pyosalpinx that transforms to a tubo-ovarian cyst

Micro: blunted, shortened, fibrotic plica contain chronic inflammatory cells; fused plica may produce a pseudoglandular pattern (chronic follicular salpingitis) that resembles malignancy

Note: mucosa of uterus, tubes & ovaries is derived from coelomic epithelium

Plica:

delicate folds of mucosa on inner aspect of tube

contain ciliated columnar cells

secretory cells (non-ciliated)

intercalated (peg) cells which may be inactive secretory cells

Epithelium secretes amylase

plica merge with fimbriae

Gross:

Normally contains neutrophils at menstruation and post-partum (don’t call salpingitis)

Muscle usually has 2 smooth muscle layers, 3 in isthmus near cornua

Covered by surface epithelium (a modified mesothelium or germinal), closely related to mullerian duct lining epithelium

Stroma resembles fibroblasts, in whorled / storiform pattern, surrounded by dense reticulin network; positive for actin and desmin

Stroma also contains luteinized stromal cells, decidual cells, fat, neuroendocrine cells, endometrial stroma-like cells

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Salpingitis

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Tubo-ovarian abscess common
Granulomatous salpingitis

**Causes:**
- Mycobacterium tuberculosis
- Actinomyces
- Crohn’s disease
- Endometriosis
- Enterobius
- Foreign bodies
- Giant cell arteritis
- Malakoplakia
- Post-diathermy

**Micro:**
- Schistosomiasis
- Xanthogranulomatous salpingitis
- Post-radiation
- Sarcoidosis

Tuberculous salpingitis

- Usually bilateral
- Hematogenous spread
- Associated with endometrial involvement

**Micro:**
- Caseating granulomas within mucosa
- Extreme adenomatous proliferation may resemble carcinoma
- Chronic inflammation and fibrosis in muscularis

Salpingitis

- Foreign body salpingitis: lubricant jelly, mineral oil, radiographic contrast media, starch, talc
- Actinomyces: Associated with intrauterine devices; bilateral in 50%; ovaries often involved
- Enterobius vermicularis (pinworm): Often migrates from lower female genital tract

Xanthogranulomatous salpingitis:
- Rare, <20 cases reported
- IgG-containing macrophages, lymphocytes, plasma cells, neutrophils, variable multinucleated giant cells
- DD: malakoplakia (Michaelis-Gutmann bodies)

Benign or non-neoplastic conditions

**Arias-Stella reaction**
- Present in 16% with ectopic tubal pregnancy

**Decidual reaction**
- Common at time of cesarean section (with accompanying tubal ligation)
- After hormonal therapy

Ectopic / tubal pregnancy

- Chronic salpingitis that destroys the lining folds and traps the ovum
- Congenital abnormalities
- Functional tubal disturbances
- Salpingitis isthmica nodosa
- Endometriosis
- Small tumor
- Often a history of infertility

**Should sample intratubal blood clot generously to identify products of gestation**

- Often rupture of maternal vessels (week 8) into gestational sac
- Uterus
- Normal appearing endometrium
- Cyclic endometrium
- Gestational hyperplasia with Arias-Stella reaction
- Does not rule out tubal pregnancy if adnexal mass present
- No enlarged
- Hyaalized spiral arteries
- No fibrinoid matrix
Endometriosis

- Endometriosis is usually present elsewhere in the pelvis
- May represent extension of endometrium from uterine cornu (10% of women have extension to isthmus)
- Associated with intratubal polyps, causing infertility or ectopic pregnancy
- Also occurs in 20-50% of tubes after ligation, particularly if short stumps, electrocautery

Endosalpingiosis

- Tubal epithelium outside the tube, analogous to endometriosis
- Usually on ovarian surface close to fimbriae
- May follow surgery or be associated with salpingitis
- Also represents a peritoneal process with proliferation of mesothelium forming small cystic structures of tubal form
- Associated with ovarian serous tumors
- May present as a tumor mass

Epithelial hyperplasia

- Present in women with estrogen producing ovarian tumors
- May also be associated with ovarian serous borderline tumors
- Often an incidental microscopic finding
- Ages 17-40 (patients with pseudocarcinomatous hyperplasia)
- May be associated with severe inflammation and scarring and resemble adenocarcinoma

Benign or non-neoplastic conditions

- Heat artifact
  - Marked pseudostratification and dark nuclear staining
  - Due to cautery or heating of specimen after removal
- Hilar cells
  - Present in 0.5% of fallopian tubes or paratubal tissue, usually in fimbriae
- Mesonephric remnants
  - In broad ligament
  - Micro: small tubules lined by low columnar to cuboidal cells without cilia; surrounded by prominent smooth muscle; may be cystic
Benign or non-neoplastic conditions

Amyloidosis: rare
- Encapsulated adrenal cortical tissue in 23%, case report of ectopic pancreatic tissue

Ectopic tissue: Encapsulated adrenal cortical tissue in 23%, case report of ectopic pancreatic tissue

Extratubal secondary trophoblastic implants: rare
- complication of conservative laparoscopic procedures for tubal ectopic pregnancies
- nodules are degenerating chorionic villi associated with implantation changes in the surrounding tissue

Placental site nodule
- Benign lesion of intermediate trophoblast; remnant of placental implantation site
- Rarely in fallopian tube

Post-tubal ligation
- Dilation of proximal tube, attenuation of plica with pseudopolyp formation and chronic inflammation, plical thickening in distal tube

Metaplastic changes
- Mucinous metaplasia associated with mucinous tumors of cervix or ovary and Peutz-Jeghers syndrome

Benign or non-neoplastic conditions

Metaplastic papillary tumor
- Rare, incidental finding usually in pregnant and post-partum women
- May be metaplastic and not neoplastic
- Gross: microscopic size, involves only part of circumference of mucosa
- Micro:
  - plicae with small rounded cysts
  - composed of large, stratified, epithelial cells with abundant eosinophilic cytoplasm
- may contain mucin and large vesicular nuclei; no / rare mitotic figures
- DDx: primary tubal carcinoma (larger, invasive, atypia)

Paratubal cysts

Common incidental findings
- Called hydatids of Morgani if large and near fimbriae or broad ligament
- Gross: attached to fimbriated end of tube by a pedicle, thin walled, clear content

Pigmentosis tubae

- Presence of hemosiderin-laden macrophages within plical stroma
- Associated with surgery for sterilization, chronic pain or benign masses

Salpingitis isthmica nodosa

- Young women, mean 26 years
- 85% bilateral
- Pathogenesis is analogous to uterine adenomyosis
- Associated with infertility in 50%; may lead to ectopic pregnancy
- Also associated with glandular inclusions in lymph nodes
- Gross: well-delimited yellow-white nodular enlargement of isthmus
### Salpingitis isthmica nodosa

**Micro:**
- regularly spaced, cystically dilated glands surrounded by hypertrophied muscle
- no stromal response, but may be accompanied by salpingitis
- occasional glands surrounded by endometrial-type stroma
- no atypia

**DDx:**
- carcinoma (irregular distribution of glands, atypia, stromal response)

### Torsion

- Usually due to inflammation or tumor, occasionally no known abnormality
- Often accompanies torsion of adjacent ovary with moderate sized cyst
- Occurs in women of all ages
- May resolve or tube may become necrotic and calcified with autoamputation of tube and ovary
- 2/3 involve right tube

### Walthard cell nests

- May represent mesothelial hyperplasia
- **Gross:** white/yellow nodules or cysts up to 2 mm, resemble granulomas
- **Micro:** well-circumscribed, small collections of cells resembling urothelium (prominent nuclear groove) on tubal serosa; minimal atypia, rare mitotic figures; cells have, 1-2 small nucleoli; may see inspissated eosinophilic secretion or mucin within lumina
- **DD:** serosal tumor implants

### Adenomatoid tumor

- **Most common benign tumor of fallopian tube**
- **Benign mesothelioma**
- **Similar to paratesticular tumor**

**Gross:** usually incidental tumor of myosalpinx (muscle layer), 2 cm or less; circumscribed, gray-white-yellow, firm; usually unilateral

**Microscopic finding**
- tubular / glandular spaces of various sizes, clusters or small cords
- flattened cells resembling endothelium or large cells with eosinophilic cytoplasm
- may have vacuoles
- may have mucinous secretions or infiltrative-like margins
- often smooth muscle hyperplasia
- rare mitotic figures; minimal atypia
- often lymphocytic follicles

**Negative stains:** CEA

**DDx:**
- Lymphangioma
- Adenomyoma (more prominent smooth muscle)
- Metastatic carcinoma (not circumscribed, invasive, atypia, mitotic activity)
- Malignant mesothelioma
- Carcinoma of the rete testis
Carcinoma

- Rare, 0.3 to 1.0% of genital tract malignancies
- Mean age 57 years, rarely teenagers; usually incorrect preoperative diagnosis
- High stage with pelvic extension or positive peritoneal cytology

Gross:
- Enlarged tube, with solid or papillary tumor filling the lumen; tumors occasionally are primary in the fimbriae; 80-97% unilateral; hemorrhage, necrosis and cysts common

To call primary in fallopian tube should arise from mucosa (endosalpinx), have tubal histologic pattern, involve the lumen; uterus and ovaries must be normal or have foci of malignancy that resemble metastases or independent primaries; if tubal wall is involved, should detect a transition between benign and malignant tubal epithelium

5 year survival: Stage 1 - 77%, Stage 3 - 20%; usually recur intraabdominally
- Associated with BRCA1 and BRCA2 mutations
- Patients with known mutation or family history of breast or ovarian cancer, should submit entire fallopian tube and ovary for microscopic examination

Micro:
- May resemble ovarian serous adenocarcinoma with complex papillary architecture
- Endometrioid tumors may be non-invasive, have squamous metaplasia, be associated with endometriosis.
- 50% serous, 25% endometrioid, 20% transitional or undifferentiated

Malignant mixed mullerian tumor

Rare, < 70 cases reported