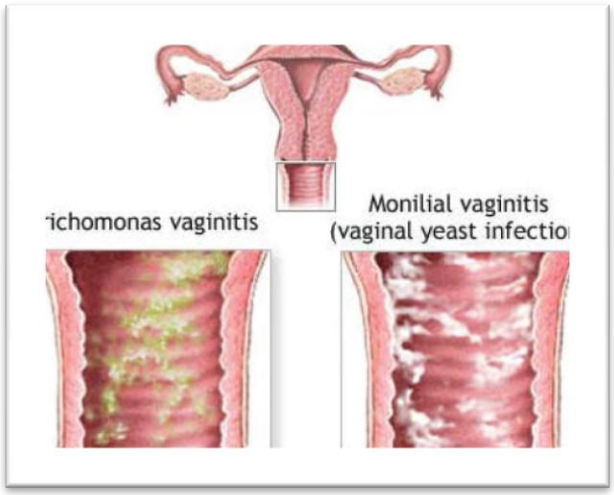
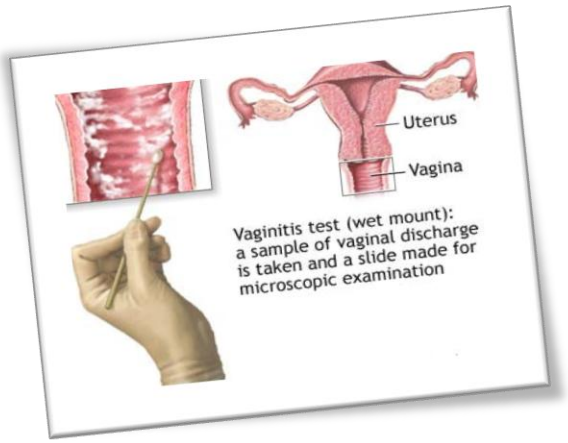
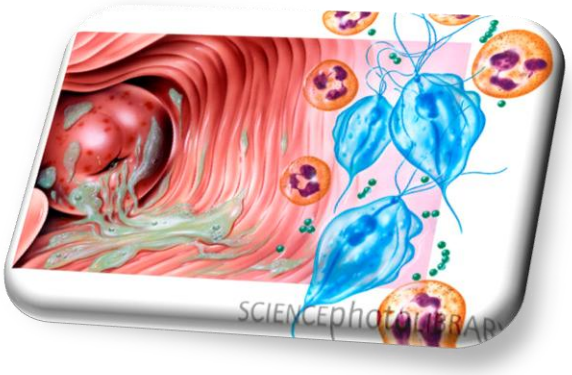


GENITAL TRACT INFECTIONS





429 OB/GYN Team Notes

Team notes are in boxes

Sources:

- High-YieldTM Obstetrics and Gynecology 2nd Edition – Elmar P. Sakala
- Hacker and Moore's Essentials of Obstetrics and Gynecology International Edition
- Ob/Gyn team 428
- Dr. Lateefa Al Dakhyel's lecture

Prepared by: Dina Al-Kuhaimi

NORMAL VS. ABNORMAL VAGINAL DISCHARGE

	NORMAL VAGINAL DISCHARGE	ABNORMAL VAGINAL DISCHARGE
VOLUME	Can vary from very little to quite a lot (particularly when ovulating or aroused) - 1-4 ml fluid/24 hours.	Sudden changes in volume, particularly if other symptoms are present.
COLOR	Clear or whitish discharge (may be yellowish when dried).	Yellow or greenish discharge, or discharge that suddenly changes color.
TEXTURE	Can vary from "paste" like and somewhat sticky to clear and stretchy, depending on where you are in your cycle and whether you are aroused.	Clumpy or lumpy discharge, with "cottage cheese" like texture.
ODOR	Mostly odorless.	A strong, foul, and sometimes "fishy" odor.

NORMAL VAGINAL DISCHARGE

- The normal vaginal flora is predominately aerobic organisms.
- The normal PH is <4.5 due to the H+ peroxide producing lactobacilli.
- Normal vaginal secretions are formed by mucoid endocervical, sloughing epithelial cells, normal vaginal flora, and vaginal transudate.
- The body increases the production of Vaginal discharge in the middle of the menstrual cycle, when the ovary releases an egg, because of "Physiologic Leukorrhea ".
- The amount of cervical mucus increases during ovulation, pregnancy, and in patients using oral contraceptive pills.

The vaginal epithelium is strongly estrogenized and rich in glycogen, which supports the growth of lactic acid-producing lactobacilli. This results in a low pH, which promotes further growth of acidophilic protective microflora.

Leukorrhea is a medical term that denotes a thick, whitish or yellowish vaginal discharge.

The term "physiologic leukorrhea" is used to refer to leukorrhea due to estrogen stimulation.

ABNORMAL VAGINAL DISCHARGE

- Vaginitis is extremely common.
- Signs and symptoms are generally similar.
- Women with vaginitis present with one or more of the following vulvovaginal signs and symptoms:
  - Change in the volume, color, or odor of vaginal discharge.
  - Pruritus, burning, Irritation, erythema.
  - Dyspareunia, dysuria.
  - Spotting.
- The most common causes of vaginitis symptoms: (>90% of cases)
  - Bacterial vaginosis.
  - Candida vulvovaginitis.
  - Trichomoniasis.

BACTERIAL VAGINOSIS (BV)

- It is caused by alteration of the normal flora, with over-growth of anaerobic bacteria.
- It is triggered by ↑ PH of the vagina (intercourse, douches).
- Recurrences are common.

BV is the most common cause of vaginitis in premenopausal women.

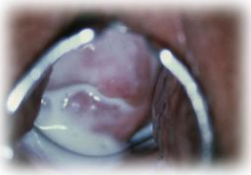
50% are asymptomatic.

Itching and inflammation are uncommon.

It is not a STD.

COMPLICATIONS

- Increases risk for:
- In pregnant women (Preterm labor, Endometritis, and postpartum fever).
- Post-hysterectomy vaginal-cuff cellulites.
- Postabortal infection.
- Acquiring other STDs, especially HIV.

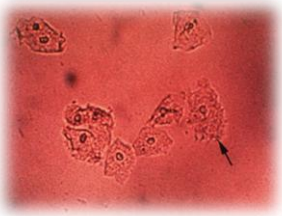


DIAGNOSIS - AMSTEL CRITERIA

1. May present with Fishy odor (especially after intercourse), no dyspareunia.
2. Homogenous, grayish-whitish discharge.
3. Presence of clue cells.
4. PH > 4.5
5. +ve whiff test (amine test) (adding KOH to the vaginal secretions will give a fishy odor) in 70-80% of cases.

Whiff test: Several drops of a potassium hydroxide (KOH) solution are added to a sample of the vaginal discharge. A strong fishy odor from the mix means bacterial vaginosis is present.

"Clue cells are the most reliable predictor of BV"



TREATMENT

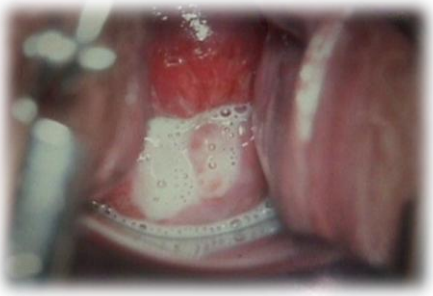
- Flagyl (Metronidazole).
- Clindamycin.
- Treatment of the partner is not recommended.

TRICHOMONAS VAGINALIS

- It is an anaerobic parasite, that exists only in trophozite form.
- 60% of patients also have BV.
- 70% of males will contract the disease with single exposure.
- Patients should be tested for other STDs (HIV, Syphilis).

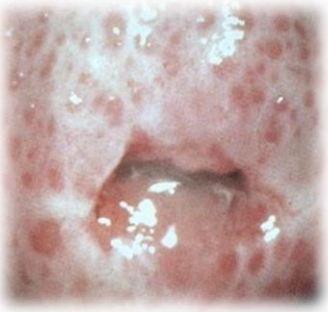
50% are asymptomatic.

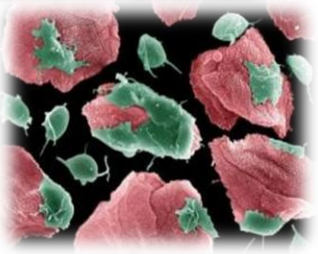
Virtually always sexually transmitted.



DIAGNOSIS

1. Profuse, frothy, purulent malodorous discharge.
2. It may be accompanied by vulvar pruritis.
3. Secretions may exudate from the vagina.
4. If severe → patchy vaginal edema and strawberry cervix.
5. PH > 5
6. Microscopy: Motile trichomands and ↑ leukocytes.
7. Clue cells if BV is present.





WET MOUNT CULTURE

- Trichomonads seen only in 50-70%.
- Elevated pH.
- Increased leukocytes.

TREATMENT

- Falgyl (Metronidazole).
- Flagyl gel is not effective.
- The partner should be treated.

CANDIDIASIS

- The second most common cause of vulvo-vaginal-related symptoms.
- 75% of women will have at least once during their life.
- 45% of women will have two or more episodes/year.
- 90% of yeast infections are secondary to Candida Albican.
- Other species (glabrata, tropicalis) tend to be resistant to treatment.

Rare before menarche, but 50% will have it by age 25.

Less common in postmenopausal women, unless taking estrogen.

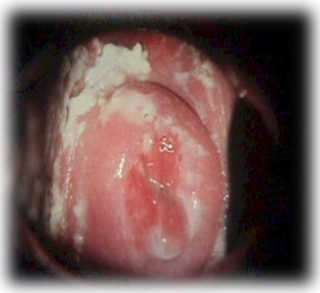
It is not a STD.

PREDISPOSING FACTORS

1. Antibiotics (disrupting the normal flora by ↓ lactobacilli).
2. Pregnancy (↓ cell-mediated immunity).
3. Diabetes (↓ immunity).
4. OCP.

DIAGNOSIS

1. Symptoms: Vulvar pruritis and burning, vaginal soreness and dysparunea, and splash dysuria.
2. The discharge vary from watery to thick cottage cheese discharge.
3. O/E: Erythema and edema of the labia and vulva & the vagina may be erythematous with adherent whitish discharge.
4. PH < 4.5 budding yeast or mycelia on microscopy.
5. Microscopic saline wet mount: Pseudohyphae (in about 70% of patients).



"If microscopy is non-diagnostic, the culture will confirm the diagnosis"

TREATMENT

- Topical Azole drugs (80-90% effective).
- Fluconazole is equally effective (Diflucan), but symptoms will not disappear for 2-3 days.
- 1% hydrocortisone cream may be used as an adjuvant treatment for vulvar irritation.
- Chronic infections may need long-term treatment (6 months) with weekly Fluconazole.

OTHER CAUSES OF VAGINITIS

ATROPHIC VAGINITIS:

- The most common cause of vaginal irritation in post menopausal women.
- The discharge has a pH > 4.5
- A simple evaluation of the epithelial cells using a saline wet-mount preparation or Pap smear confirms the diagnosis, with immature basal cells and parabasal cells replacing superficial vaginal epithelial cells.
- The treatment of choice is topical estrogen cream.

As the term indicates, the atrophy of the vaginal epithelium results in secondary infection.

Patients complain of vulvar irritation with purulent discharge, dyspareunia and post-coital bleeding.

ATYPICAL MANIFESTATIONS: *HSV, HPV*

HERPES SIMPLEX VIRUS

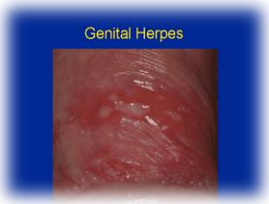
- The most common STD in the US, and likely the world.
  - > 45 million in the US.
  - > 1 million newly diagnosed annually.
  - Almost 25% of Americans have HSV2 antibodies by the age of 30.
- HSV has two serotypes, HSV-1 and HSV-2.

HSV-1

- Most commonly associated with oral lesions, but increasing cause of primary genital herpes.

HSV-2

- The cause of 70% of primary genital herpes and > 95% of recurrent genital herpes.



PRIMARY HERPES

- Primary lesions consist of clear vesicles that develop at the site of exposure and spontaneously rupture, forming shallow, painful ulcers with raised edges.
- Systemic – Fever, malaise, headache, and lymphadenopathy.
  Can have meningitis, encephalitis, or hepatitis.
- Local – Clusters of small, painful blisters that ulcerate and crust outside of mucous membranes.
  Often associated with itching, dysuria, vaginal discharge, inguinal adenopathy, bleeding from cervicitis.

- New lesions form for about 10 days after initial infection, but can last up to 3 weeks.
- Shedding of virus lasts 2-10 days.

After primary infection, the virus is latent in the local sensory ganglia and may reactive causing infectious viral shedding with or without symptoms.

RECURRENT HERPES

- Reactivation of virus.
- It may be activated by stress or menses and is preceded by prodromal paresthesia (a ***Prodrome***; is an early symptom (or set of symptoms) that might indicate the start of a disease before specific symptoms occur. ***Paresthesia***; is a feeling of tingling and itching at the specified site.)
- The lesions are fewer, unilateral, and less painful. (Mild, self-limited)
- Localized without systemic complaints, lasting 6-7 days.
- Shedding lasts for 4-5 days.

TRANSMISSION

- Horizontal Transmission:
- Intimate sexual contact (oral/genital).
- Aerosol and fomite transmission is rare (A fomite is a medium capable of transmitting infectious organisms from one individual to another).
- Vertical Transmission:
- Maternal-infant via infected cervico-vaginal secretions, blood, or amniotic fluid at birth.
- Autoinoculation:
- From one site to another.

DIAGNOSIS

1- Viral Culture – Most accurate
   - High specificity, low sensitivity
   - 50% for primary infection
   - 20% for recurrent infection
2- Direct detection of virus (Tzcank smears, PCR)
3- Serology
   - Newer tests that are specific for type of virus (HerpeSelect 2, Herpes glycoprotein for IgG, ELISA)

ORAL ANTIVIRAL THERAPY

- Acyclovir (Zovirax)
- Famciclovir (Famvir)
- Valacyclovir (Valtrex)

- The goals of treatment for genital herpes are symptom relief, acceleration of lesion healing, and a decrease in frequency of recurrences.
- No treatment can eradicate the latent virus from the dorsal ganglia of the spinal cord.

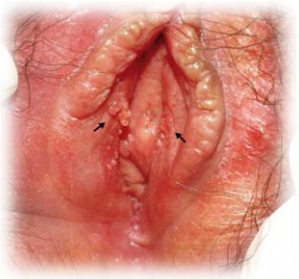
GENITAL WARTS

- Genital human papillomavirus (HPV) is a common viral STI.
- In 90% of cases, the body's immune system clears HPV naturally within 2 years. But, sometimes, HPV infections are not cleared and can cause genital warts.
- Condyloma accuminata secondary to HPV infection (usually types 6 & 11), these are non-oncogenic types.
- HPV types 16 & 18 (oncogenic type) are the most commonly isolated HPV types in cervical cancer.
- Usually at areas affected by coitus (posterior fourchette)
- 75% of partners are infected when exposed.
- Recurrences after treatment are secondary to reactivation of subclinical infection.

Most HPV cases are latent infections with no visible lesions and are only diagnosed by DNA hybridization testing performed in the evaluation of an abnormal Pap smear.

DIAGNOSIS

- Diagnosis is usually clinical, though biopsy is indicated if the lesion is pigmented to exclude other pathology.



TREATMENT

- Provider-applied topical therapies:
- Podophyllin 10-25%
- Triochloroacetic acid 80-90%
- Patient-applied topical therapies:
- Podofilox 0.5%
- Surgical therapies:

- Cryotherapy
- Electrodesiccation or cautery
- Laser (Expensive, reserve for patients who have not responded to other regimens)
- Interferon

NONINFECTIOUS VULVOVAGINITIS:

- Irritants/allergens
- Lichens syndromes (sclerosus, simplex chronicus, planus)
- Cytolytic vaginitis

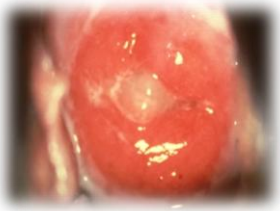
Lichens sclerosus: is a disease of unknown cause that results in white patches on the skin, which may cause scarring on and around genital skin.

Lichens simplex chronicus: is a skin disorder characterized by chronic itching and scratching. The constant scratching causes thick, leathery, brownish skin.

Lichen planus: is a chronic mucocutaneous disease that affects the skin, tongue, and oral mucosa. The disease presents itself in the form of papules, lesions, or rashes.

CERVICITIS

- Neisseria Gonorrhea and Chlamydia Trachomatis infect only the glandular epithelium and are responsible for mucopurulent endocervisitis (MPC).
- Ectocervix epithelium is continuous with the vaginal epithelium, so Trichomonas, HSV, and Candida may cause ectocervix inflammation.



May cause abnormal vaginal discharge, post-coital or irregular bleeding, lower abdominal pain, and dysuria.

70% of women and 50% of men are asymptomatic.

DIAGNOSIS

- Culture on Thayer- martin media (for Gonorrhea).
- ELISA, direct IFA (for Chlamydia).

TREATMENT

- Neisseria Gonorrhea
  - Ceftriaxone IM (Single dose)
  - Ofloxacin orally (Single dose)
  - Cefixime orally (Single dose)
  - Ciprofluxacin orally (Single dose)
- Chlamydia Trachomatis
  - Doxycycline orally for 7 days
  - Azithromycin orally (Single dose)

In pregnancy, ampicillin orally or ceftriaxone IM may be used.

Doxycycline is contraindicated in pregnancy, but azithromycin and erythromycin are not known to be harmful.

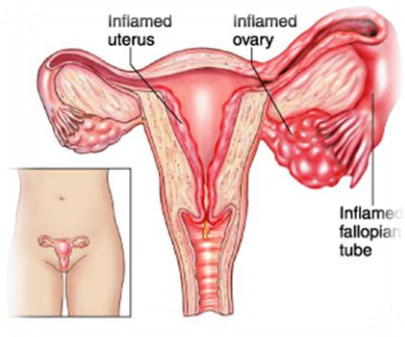
- Ofloxacin orally for 7 days
- Erythromycin orally 4 times a day for 7 days

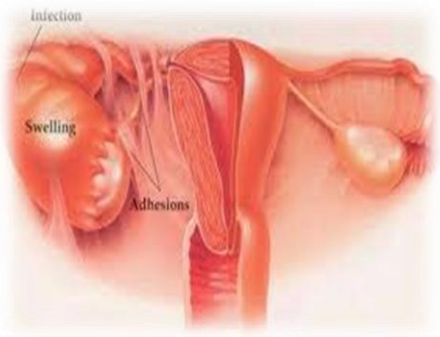
  - It is estimated that 30% of untreated Chlamydial cervicitis will progress to PID.
  - In pregnancy the prevalence of Chlamydia is around 6%. There is an associated risk of pre-term delivery and fetal growth restriction and low birth weight, with increased neonatal morbidity and mortality.

PELVIC INFLAMMATORY DISEASE (PID)

DEFINITION

- PID is infection of the pelvic organs almost invariably from ascending infection through the genital tract.
- Infection is most common in the fallopian tubes (Salpingitis), but Endometritis (uterus), Oophoritis (ovary), peritonitis (peritoneum) and tubo-ovarian abscess also occur.





- Organisms: Chlamydia, N Gonorrhea.
- Less often: H Influenza, group A Strept, Pneumococci, E-coli.

EPIDEMIOLOGY

- More than 10% of reproductive-aged women report a history of PID.

PID is most common in 18-25 years old.

RISK FACTORS

- Sexual behavior.
- Multiple sexual partners.
- Young age < 20 years old.
- IUD user.
- Surgical procedure.
- Previous acute PID,

Infection is largely by sexual contact. It may be asymptomatic for some time (up to years) and be activated spontaneously or after instrumentation of the uterus.

- Re-infection → untreated male partners 80%.
- Smoking.

428 NOTES

ETIOLOGY:

1- Organisms ascend from the lower genital tract to-cervix-to-endometrium-to-fallopian tubes without deep invasion:

- *This type called classic PID (Salpingitis-Oophoritis).*
- *Organisms: Mainly N.Gonorrhea, Chlamydia.*
- *Findings: Purulent salpingitis into peritoneal cavity.*

2- Organisms invade endometrial lymphatics and penetrate deep into the myometrium and parametrium:

- *This type happens in Post-abortion and post-partum infections.*
- *Organisms: Staphylococcus, streptococcus, and E-coli.*
- *Findings: Cellulitis of the endo-, myo-, and parametrium (endomyoparametriti).*

3- Organisms are carried from the lungs to the pelvic organs through blood:

- *This type happens in pelvic TB.*
- *Organisms: M.tuberuclosis.*
- *Findings: Salpingitis, Oophoritis, and endometritis.*

COMPLICATIONS

- Women with clinical PID are 6 times more likely to have an ectopic pregnancy.
- Patients with PID are 14 times more likely to have tubal factor infertility than patients without PID.
  Infertility rate increases direct with number of episodes of acute pelvic infection.
- Women with a history of PID are 6 to 10 times more likely to have the diagnosis of endometritis, suffer from chronic pelvic pain (4 fold increase), or require a hysterectomy.
- Women with prior salpangitis are at increased risk for premature labor.
- Tubo-ovarian abscess (TOAs) occur in about 10% of women hospitalized for PID. A high mortality rate is associated with ruptured TOAs (10%).
- Fitz-Hugh-Curtis syndrome is a rare complication of PID. It involves liver capsule inflammation.

Fitz-Hugh-Curtis syndrome is a spread of pelvic infection in PID into the upper abdomen and cause inflammation of the capsule of the liver (Perihepatitis) results in "violin string adhesions". – as shown in the picture bellow.

DIAGNOSIS

SYMPTOMS:

- Some are asymptomatic.
- Bilateral abdominal-pelvic pain and tenderness (especially when walking or during coitus).
- Abnormal vaginal discharge.
- Fever/Chills.
- Nonspecific symptoms such as pelvic pressure or back pain that radiates down the legs may be present.
- Nausea and vomiting may be reported with severe infections (less common).
- Irregular vaginal bleeding and dysuria are less common symptoms.

SIGNS:

- Lower abdominal tenderness, with or without rebound tenderness.
- Cervical motion tenderness; which indicates peritoneal inflammation.
- Adnexal tenderness (It is the symptom of pain from the ovary and fallopian tube, usually noted by a doctor during a pelvic examination or pap smear examination).
- Findings of mucopurulent cervicitis.
- Leukocytosis.
- Fever (least common).

INVESTIGATIONS

- Cervical culture, PCR, and antigenic tests to detect Chlamydial and gonococcal infections.
- CBC for leukocytosis.
- Increased erythrocyte sedimentation rate (ESR).
- Elevated C-reactive protein level.
- Pelvic ultrasound may show enlarged, tender fallopian tubes as well as cul-de-sac fluid.
- Culdocentesis (extraction of fluid from the rectouterine pouch) reveals pus in the cul-de-sac.
- Laparoscopy is diagnostic in visualizing acute inflammation of the oviducts.

Laparoscopy is indicated if the diagnosis is unclear or there is no response to treatment after 48h.

DIFFERENTIAL DIAGNOSIS

- Acute appendicitis.
- Endometriosis.
- Torsion/rupture of an adnexal mass (ovarian cyst, etc.).
- Ectopic pregnancy.
- Urinary tract infection (Pyelonephritis)
- Irritable bowel syndrome.
- Inflammatory bowel disease.

TREATMENT

- Empiric antibiotics should be given.

Patients should be seen 3 to4 weeks after treatment has been completed for a full STI screen to exclude any resistant infection.

ONLY the Outpatient Treatment was mentioned in the lecture!

CDC Recommended treatment regimens for PID

	Regimen A	**Regimen B**
Inpatient treatment	- Cefoxitin *Or* - Cefotetan *PLUS* - Doxycycline	- Clindamycin *PLUS* - Gentamicin
Outpatient treatment	- Ofloxacin *Or* - Levofloxacin *With or without* - Metronidazole	- Cefoxitin, and Probenecid *Or* - Ceftriaxone *Or* - Equivalent cephalosporin *PLUS* - Doxycycline *With or without* - Metronidazole

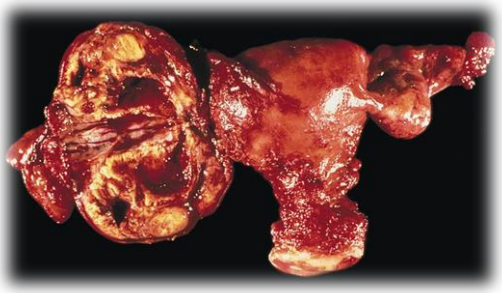
428 NOTES:

Criteria for hospitalization of patients with acute PID

- *Surgical emergencies not ruled out yet (appendicitis).*
- *Pregnancy.*
- *Failed oral Rx.*
- *Unable to tolerate an outpatient regimen.*
- *Severe illness (high fever, nausea, vomiting).*
- *Tubo-ovarian abscess shown or suspected.*

TUBO-OVARIAN ABSCESS (TOA)

DEFINITION



- An inflammatory mass due to inappropriately or untreated acute PID. – End stage PID
- Involving fallopian tubes, ovaries, bowel, and possibly other pelvic structures result from reactivation or repeated infections.
- Others may occur as a result of postpartum or postoperative infections.

CHARACTERISTICS

- It doesn't contain significant amounts of pus (so mainly no drainage needed).
- Easily treated with antibiotics.
- If ruptured causes spreading peritonitis.

EPIDEMIOLOGY

- TOAs occur in about 10% of women hospitalized for PID.

ETIOLOGY

- Most commonly bacteroids and E.Coli.

SYMPTOMS

- Severe bilateral abdominal-pelvic pain.
- Nausea and vomiting.
- Severe back pain.
- Painful defecation.
- Severe rectal pain.

CLINICAL EXAMINATION

- Sepsis is usually apparent. High fever and tachycardia.
- Peritoneal signs: abdominal guarding and rigidity.
- Pelvic examination signs: mucopurulent cervical discharge, exquisite cervical motion and rectal tenderness, with bilateral tender adnexal masses.
- Rectal Ex. is the best method for palpation of the mass.

DIAGNOSIS

- US, CT, or MRI.
- Laparoscopy or laparotomy, if there is doubt regarding the diagnosis.

MANAGEMENT

- Admit the patient.
- Medical Rx:
  - Even large abscesses may resolve.
  - (Cefoxitin + Doxycycline or Clindamycin + Gentamicin)
- Cul-de-sac drainage: if fever persists despite antibiotics.
- Emergency laparatomy:
  - If Pt. deterioration or abscess rupture.
  - [TAH BSO] Total abdominal hysterectomy
    Bilateral salpingio-oophorectomy is advised.

SUMMARY

Common Causes of Vulvo-vaginitis

Infection	Symptoms/Findings	Diagnosis	Treatment
Bacterial Vaginosis	Asymptomatic Vaginal odor; after intercourse Increased discharge	Wet prep "clue cells" Release of amine odor; +ve whiff test with KOH pH > 4.5	○ Flagyl ○ Clindamycin Treatment for the partner is not recommended.
Trichomoniasis	Asymptomatic Increased thin or thick green or yellow foul-smelling discharge Strawberry cervix	Motile trichomonads on microscopic examination of wet mount	○ Flagyl (Metronidazole) The partner should be treated.
Candidiasis	Vaginal burning Itching, Irritation Curdy white discharge	Wet prep and/or KOH microscopic examination shows pseudohyphae, or budding yeast	○ Fluconazole ○ Topical Azole ○ 1% hydrocortisone as adjuvant