Salpingitis — Diagnosis and Treatment
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Salpingitis is the inflammation of the fallopian tubes usually due to gonorrhreal or chlamydial infections, but other gram-negative and anaerobic bacterial pathogens have been also implicated. Patients can present with lower abdominal pain, fever and an elevated erythrocyte sedimentation rate. Ultrasonography and diagnostic laparoscopy can help confirm the diagnosis of salpingitis and exclude other differential diagnoses or associated complications such as hydrosalpinx, adhesions, and tubo-ovarian abscesses. Antimicrobial management is the mainstay of treatment and surgical management should be reserved to patients with non-responsive tubo-ovarian abscesses or ruptured abscesses.

Definition of Salpingitis

Salpingitis is an infection that causes inflammation of the fallopian tubes. Salpingitis is a form of pelvic inflammatory disease (PID) which refers to an infection of the female reproductive organs. Some patients with pelvic inflammatory disease might not have salpingitis since PID is used to refer to many diseases in the female genital tract.
Epidemiology of Salpingitis

Inflammation of the fallopian tubes is the most common infection in women in their reproductive age. Approximately 2% of sexually active women develop salpingitis annually.

The most common etiological factor for salpingitis is chlamydia. Expansion of screening programs for asymptomatic chlamydia infection has dramatically decreased the incidence of salpingitis and pelvic inflammatory disease.

Salpingitis is more common among teenagers, patients with multiple sexual partners and high frequency of unprotected sexual intercourse.

The disease mostly follows a sexually transmitted infection and thus examples of groups at risk include those with:

- Multiple sexual partners.
- Prior sexually transmitted disease.
- Instrumentation or surgery that would lead to sexually transmitted infection.
- History of having unprotected sex.

Etiology of Salpingitis

Salpingitis is an infectious disease that has been associated with multiple organisms. Neisseria gonorrhoea and chlamydia trachomatis are the most commonly identified pathogens in both pelvic inflammatory disease and salpingitis.

Other possible pathogens include Gardnerella vaginalis, Escherichia coli, Haemophilus influenzae, group B beta-hemolytic streptococci and bacteroides. After the widespread of screening programs for gonorrhea and chlamydia infections, the other pathogens are becoming as common as the etiology of salpingitis in the developed world.
Pathophysiology of Salpingitis

Salpingitis occurs when the pathogens ascend through the cervix, endometrium and eventually reach the fallopian tubes. The insertion of intrauterine devices, endometrial biopsy, dilation and curettage, hormonal changes by menstruation, and retrograde menstruation all predispose to salpingitis.

Complications of Salpingitis

Salpingitis, if left untreated, might develop chronic pelvic pain which is known to be difficult to treat. This syndrome of chronic pain can be caused by pelvic adhesions or by the formation of tubo-ovarian abscesses. Additionally, hydrosalpinx can cause pelvic pain.

Laparoscopy lysis of the adhesions can be attempted for chronic pelvic pain. Patients with a tubo-ovarian abscess usually present with a new-onset acute abdominal and pelvic pain, fever and an abdominal mass. Ultrasonography imaging of the tubo-ovarian abscess is indicated to rule-out rupture. Non-ruptured abscesses can be treated with antimicrobials while ruptured abscesses should be treated surgically and to be adequately drained and the pelvis needs to be irrigated.

Long standing or recurrent history of salpingitis or pelvic inflammatory disease leads to subfertility and an increased risk of ectopic pregnancy.

Clinical Presentation of Salpingitis

Patients with acute salpingitis usually present with pelvic pain, an adnexal mass and fever. Additionally, inflammatory biomarkers such as erythrocyte sedimentation rate might be elevated.

Other features may include foul smelling vaginal discharge, intermenstrual spotting, nausea, vomiting and frequent urination.

Diagnostic Work-up for Salpingitis

It is currently recommended to make the diagnosis of salpingitis a clinical one and to use laboratory or imaging studies to exclude other differential diagnoses.

Erythrocyte sedimentation rate and c-reactive protein are usually elevated in inflammatory conditions including salpingitis and they can be checked in this group of patients. Additionally, a cervical swab and culture is indicated to define sensitivity patterns for N gonorrhea and chlamydia as they are the two most common identified pathogens. Treatment, however, should not be delayed waiting for the culture results.
Patients with chronic pelvic pain can undergo a laparoscopy which is both diagnostic and therapeutic. Diagnostic laparoscopy can directly visualize the fallopian tubes which are usually swollen when inflamed. Additionally, adhesions and abscesses can be identified and excluded.

Patients with salpingitis have a somewhat similar picture to ectopic pregnancy and ultrasonography can help exclude this especially when combined with a beta-hCG test when appropriate. Additionally, ultrasonography can reveal hydrosalpinx or edema and fluid accumulation in the tubes which are signs of inflammation. Abscesses can also be visualized on ultrasound.

If an endometrial biopsy is performed, endometritis is usually evident because the majority of the patients have an ascending infection and the pathogens usually go through the endometrium before reaching the fallopian tubes.

**Treatment of Salpingitis**

When a patient present with adnexal tenderness, fever and an elevated erythrocyte sedimentation rate, the physician needs to decide whether inpatient or outpatient treatment is needed.

**Pregnant patients**, those who have a tubo-ovarian abscess, patients with severe vomiting and a high fever or when there is no response to outpatient management should be treated as inpatients. Inpatient regimens for salpingitis include cefotetan or cefoxitin plus doxycycline OR clindamycin plus gentamicin. These drugs should be given intravenously and 24 hours after clinical improvement the patient should be put on doxycycline alone for two more weeks.

Patients with intrauterine devices do not benefit from removing the intrauterine device unless they do not show any clinical improvement after three days from starting the medical treatment.

Several regimens exist for the outpatient management of salpingitis. Ceftriaxone plus doxycycline with or without metronidazole, OR cefoxitin plus probenecid, plus doxycycline with or without metronidazole are both effective. Doxycycline should be used for 14 days after the first 24 hours of clinical improvement with discontinuation of the other drugs.

Patients with a tubo-ovarian abscess that is not ruptured can be treated medically with clindamycin plus gentamicin to cover both anaerobes and gram-negative organisms.
Additionally, **ampicillin** should be used if enterococcus is suspected to complicate the picture. Patients with tubo-ovarian abscesses who are not responding to medical treatment need **surgical intervention**. Surgery can involve a **unilateral andexectomy** or simple drainage of the abscess by **laparoscopy** or percutaneously.

When the abscess is in the cul-de-sac, is midline, adherent to the **peritoneum**, and appear cystic on ultrasound, a **posterior colpotomy** can be used. Otherwise, **percutaneous drainage** or **laparotomy** might be indicated to drain the abscess.

If the tubo-ovarian abscess ruptures, the patient will become severely sick and the pelvic pain will intensify. In that case, surgical treatment is an emergency and any delays carry a **significant mortality risk**.

The surgery includes removal of the abscess, the uterus, tubes, both ovaries and irrigation of the pelvis to remove the pus. If the abscess is unilateral and fertility is desired, a **unilateral salpingo-oophorectomy** can be done. Unfortunately, without a **hysterectomy**, the risk of recurrence of salpingitis in the other tube after a tubo-ovarian rupture is relatively high and this should be discussed and addressed with the patient if possible.

Delays usually result in a **complicated postsurgical recovery** due to bacterial absorption into the different pelvic organs which can lead to **incision dehiscence**, **intestinal obstruction**, **fistulas** or **acute respiratory distress syndrome** and **septic shock**. Fortunately, salpingitis complications are becoming rarer after the introduction of screening programs for chlamydial and gonorrheal infections.

**References**

Fallopian Tube Disorders via medscape.com

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