Tubo Ovarian Abscess Caused by Streptococcus Group B: A Case Report and Literature Review

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ABSTRACT

A 34 year-old Thai female woman who had a previous history of recurrent pelvic inflammatory disease or recurrent pelvic inflammatory disease (PID), presented with recurrent pelvic pain and high grade fever. She was admitted and a diagnosis of tubo ovarian abscess was made. Physical examination and ultrasonographic examination demonstrated high grade fever, adnexal tenderness and a right mixed solid cystic mass compatible with tubo ovarian abscess. Despite prescription of combined parenteral antibiotic, her symptoms did not improve. An exploratory laparotomy showed a left ovarian abscess with a kinked fallopian tube behind the uterus. A left salpingectomy with partial oophorectomy was performed. Cultured pus was identified as group B streptococci. Antibiotics therapy was continued until clinical improvement and she was discharged on the seventh post operative day.

Tubo ovarian abscess or tubo ovarian abscess (TOA) is a serious consequence of PID. The streptococcus group B infection is a rare cause of TOA. There is a discussion about diagnosis, medical treatment and surgical treatment. Although medical treatment with broad-spectrum antibiotics has allowed patients to avoid operations, some of them who failed medical treatment required surgical treatment. Especially in women who need childbearing potential in future, conservative surgery has become the initial approach as well as this case report.

Keywords: Investigation, streptococcus group B, treatment, tubo ovarian abscess

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Fig 1. Operative finding revealed left tubo-ovarian abscess which was adhered to the posterior aspect of the uterus and displaced to the right side of the uterus. Left fallopian tube and left ovary were absent.

Count of 331,000/mm³, BUN was 9 mg/dL, while creatinine was 5.5 mg/dL. Blood electrolyte showed sodium of 136 mg/dL, potassium of 3 mg/dL, chloride of 100 mg/dL, and 24 mEq/L. Urinary analysis was normal.

Gram staining of the cervical swab revealed a few gram-positive cocci in pairs. Transvaginal ultrasound showed an anteverted uterus with size 63 x 33 mm with a clear visual thin endometrium. The right ovary size was 64 x 33 mm which demonstrated a mixed solid cystic mass with thick wall cyst and echogenic content inside. The left ovary was not seen. A diagnosis of pelvic inflammatory disease with tubo-ovarian abscess was made. Differential diagnosis was infected ovarian tumor, endometrioma with complication. The patient was admitted. Intravenous clindamycin 2,700 mg per day and gentamicin 240 mg per day was given. Electrolyte was corrected with KCL replacement. Oral ferrous fumurate was prescribed. Hb typing was done. Stool examination and occult blood were investigated and were normal. Her symptoms including persistent fever, and her pelvic pain did not improve. Pelvic examination showed tenderness on cervical excitation and right adnexal tenderness. Repeated pelvic ultrasonography showed a right adnexal with size 59 x 29 mm and contained mixed echoic content. A cervical swab culture demonstrated numerous beta hemolytic streptococci, while hemoculture showed no growth. During admission, her symptoms such as fever and abdominal pain did not improve. Tubo-ovarian abscess with failure of medical treatment was diagnosed and then an exploratory laparotomy was performed 5 days after admission. At the time of surgery, operative findings showed a left ovarian abscess with kinking fallopian tube behind the uterus. The uterus was normal size and normal contour. There was a lot of fibrin and adhesion between the bowel and omentum to the anterior abdominal wall from previous surgery. The details of operative finding are shown in Fig 1. A left salpingectomy with a partial oophorectomy was performed after the adhesiolysis. The patient tolerated the procedure well. Pus was sent for microscopic examination and culture.

Pathologic review of the surgical specimens revealed acute and chronic inflammation with necrotic tissue of the left ovary. The left fallopian tube showed evidence of acute and chronic salpingitis. On microscopic examination, gram stain revealed identical gram-positive cocci in pairs. The final pus culture showed streptococcus group B. The post operative recovery period was uneventful. Her fever and abdominal pain subsided. Intravenous penicillin 12 million units per day which was added to clindamycin and gentamicin were administered for 7 days, and she was discharged on the seventh post operative day.

**DISCUSSION**

Tubo-ovarian abscess (TOA) which is a known complication of pelvic inflammatory disease (PID), is a common cause of inflammatory pelvic masses in women of reproductive age, and it is also the most common intra-abdominal abscess in pre-menopausal women. 1 The incidence is expected to increase with the current epidemic of STDs. TOA are especially prevalent in patients infected with HIV. Risk factors for TOA are similar to those of PID and include a history of PID, multiple sexual partners, IUD use, lack of contraceptive use, low socioeconomic status and immuno-compromised status. 2 In this case, risk factors such as a previous history of PID, diabetic mellitus and anemia were demonstrated. Nearly 70% of all TOA are unilateral. 1, 2

The common route of infection is an ascending infection through the cervix to the uterus. Acute PID results from ascending infection from the vagina and cervix in greater than 99% of cases. Studies of the microbiologic etiology of TOA show that they are typically polymicrobial with a mixture of anaerobic, aerobic, and facultative organisms. Some organisms frequently isolated include Escherichia coli (37%), B fragilis (22%), other bacteroides species (26%), peptostreptococci (19%), and peptococci (11%). 3, 4 Anaerobic organisms are particularly prevalent in these abscesses and have been isolated from 63% to 100% of TOA when superb microbiologic technology was used. 3, 5 Abscesses that develop in long-term IUD users may be caused by Actinomyces israelii, a gram-positive anaerobe. 1 Neisseria gonorrhoeae and Chlamydia trachomatis are considered major pathogens of PID, but they are rarely cultured from these abscess cavities. Previous studies demonstrated that only few organisms such as Neisseria gonorrhoeae, Neisseria meningitides, Streptococcus pyogenes, Streptococcus pneumoniae, and Haemophilus influenza can be a mono-microbial etiologic cause of acute PID. 1 In this presenting case, only streptococcus group B which was isolated from a cultured cervical swab and ovarian abscess, was the pathogenic cause. As described elsewhere, 6 many cases of TOA which was apparently not related to STDs, were believed to be initiated by bacteria that constitute part of the patient’s normal vaginal flora. In vitro studies have shown that the inoculation of...
tubal epithelium, muscularis, and serosal layers by these symbiotic pathogens induces an intense inflammatory response. This response is secondary to the lysosomal enzymes, exotoxins, antigens, and surface virulence factors produced by these bacteria, especially the anaerobes. The reaction induces edema, which in turn compromises the blood supply, leading to necrosis and ischemia. The following chain of events results in a collection of inflammatory exudates such as pus, which spill out of the fimbriated end of the fallopian tube. As the inflammatory response extends to neighboring structures, such as the ovary, round ligament, broad ligament, appendix, and the sigmoid colon, the body’s immune response attempts to keep the inflammation in check by walling off the abscess. After this phase of the inflammatory process, tissue planes are lost and the identification of neighboring organs such as: appendix, sigmoid colon, and cecum becomes difficult. As this process progresses, the rupture of the abscess may occur at any point.

Most of patients typically present with abdominal and pelvic pain with or without fever and chills, and a history of PID is elicited in as many as 46% of patients, whereas anorexia and changes in bowel habits, typically diarrhea, are frequently seen in patients with disease involving the bowel. Physical examination commonly reveals lower abdominal pain with peritoneal signs of rebound tenderness and guarding. Speculum examination shows copious mucopurulent cervicovaginal secretions. Our case presented with pelvic pain with fever. She had no gastrointestinal symptoms. Pelvic examination revealed adnexal pain, cervical excitation pain with mucopurulent vaginal discharge. In addition, our laboratory data also showed bacterial infection as mention elsewhere.

Imaging studies of the abdomen and pelvis such as ultrasonography, and CT scan are crucial in the diagnosis of TOA. The typical ultrasonographic finding is a complex cystic adnexal or cul-de-sac mass with thick irregular walls, septations, and internal debris and echoes. In this case, transvaginal ultrasonography which was an initial investigation showed a complex cystic mass as well as typical appearance of TOA. The sensitivity of ultrasonography in the diagnosis of TOA has been quoted as high as 90% to 95%. In addition to the above, CT may be helpful as well. It (is it the imaging studies, ultrasonography or CT - it is not clear), also demonstrated detail of pelvic mass and other associated finding with TOA such as hydroureter or hydrenephrosis: inflammatory involvement of the periureteral tissues impeding the peristaltic activity of the ureterus, and internal gas bubbles within the abscess cavity: which are specific for TOA especially (Clostridial infection). In this case, both ultrasonographic findings demonstrated a right mixed echoic cystic mass. However, it is not surprising that the left ovarian abscess adhered to the right aspect of the uterus was demonstrated in the operative finding. A possible explanation is that the left fallopian tube and ovary which had disappeared were the result of tubal occlusion before admission.

TOA was previously treated surgically with total abdominal hysterectomy and bilateral salpingo-oophorectomy. Many complications including adjacent organ injury can occur. Kaplan and associates demonstrated that 8.4% of patient who underwent TAH/BSO during 24 to 72 hours of antibiotic therapy associated with bowel injury. Although this extreme approach yielded excellent cure rates, it left many young women castrated without any future childbearing potential. Nowadays, the management of unruptured TOA such as broad-spectrum antibiotics, conservative surgery, and imaging guided drainage has become the initial treatment. The antimicrobial regimen chosen must have appropriate coverage against common organisms in TOA, including B fragilis, peptostreptococci, gram-negative aerobes, C trachomatis, and N gonorrhoeae, and this antibiotic such as clindamycin, or metronidazole, should be able to penetrate the abscess cavity. Combination of clindamycin and gentamicin were implemented as the initial approach in this case. Eschenbach demonstrated that a clindamycin combination regimen achieved the highest response rates (68%) of antimicrobial treatment. This improved response with clindamycin may result from some of its distinctive features. First, this antibiotic has superior activity against resistant anaerobes such as B fragilis. Second, the abscess cavity has a low partial pressure of oxygen, which allows the anaerobes to proliferate, leading to tissue destruction and vaso-compromise. This makes the penetration of antibiotics difficult. It also shows that high concentrations of clindamycin are found in these abscesses as a result of active transport by polymorphonuclear cells. If there is a clinical failure to respond, defined by one of the following signs or symptoms: an increase in the size of the abscess, persistent elevation of the fever, or rupture of the TOA with signs of peritonitis within 48 to 72 hours; then surgical intervention or percutaneous drainage of the abscess cavity should be undertaken. The diagram for the management of TOA is shown in Fig 2. Many surgical techniques have been established such as: laparoscopic surgery, percutaneous drainage or exploratory laparotomy. The objective of surgery is to drain of the infected material or remove infected tissue. In this aspect of surgical treatment, there are three indications for surgical treatment of patients with TOA. First is intra-abdominal rupture of a TOA, which is a surgical emergency and surgery should be expedited once the diagnosis of rupture has been made. Conservative surgery such as unilateral adnexectomy with aggressive antibiotic therapy in patients, who need future fertility, should be performed as the treatment of choice. The second indication for surgical management of patients with TOA is the failure of clinical response within 48 to 72 hours of initiation of appropriate IV antibiotic treatment (clinical response includes improvement of symptoms and decrease in temperature and leukocyte count, but not necessarily a cure). Finally, operative treatment has been advocated for patients when there is a high suspicion of surgical emergencies such as appendicitis, cholecystitis, or bowel perforation. In this case, this patient failed to respond to combined systemic antibiotic after 72 hours from initial treatment, and then exploratory laparotomy was performed. Left salpingectomy and partial oophorectomy which was a fertility-preserving operation was the surgical procedure in this case. Previous studies showed that spontaneous pregnancy after TOA are rare and are reported to range from 5% to 15%. According to operative findings which demonstrated absence of right fallopian tube with severe pelvic adhesion, a left salpin gectomy was performed in this operation, therefore, is a candidate for assisted reproductive technology (in vitro fertilization) for future attempts to conceive. Post operation, streptococcus group B was identified, and intravenous antibiotics were given to eradicate the pathogen for 7 days.

The normal flora which live in the vagina can consist of Lactobacilli, Streptococci, Staphylococci, and gram-negative rods. In addition, streptococci are common vaginal species but very few present as pathogens. Most vaginal isolates of Beta Streptococcus are Group A (Streptococcus
pyogenes) or Group B (Streptococcus agalactiae). Group A is associated with pharyngitis, rheumatic fever, scarlet fever, and post streptococcal glomerulonephritis. Group B is a leading cause of neonatal sepsis.

We performed a MEDLINE search from 1940 to October 2007 of the printed English medical literature regarding tubo ovarian abscess which was caused by streptococcus group B. Streptococcus Group B has never been reported as a pathogen of TOA. There are, however, reports of tubo ovarian abscess caused by other types of mono organism such as Streptococcus Group F, Streptococcus pneumoniae, and Vibrio vulnificus.

In conclusion, we report a case of streptococcal Group B tubo ovarian abscess in a single female patient. Although streptococcus group B is present in a vagina as a normal flora, physicians should be aware that rare cases of tubo ovarian abscess can be caused by only streptococcal Group B. Swab culture should be done to identify the causative organism of tubo ovarian abscess. In addition, broad spectrum antibiotics should be implemented to cover suspected causative organisms of tubo ovarian abscess.

REFERENCES