

Perimenopausal pneumococcal tubo-ovarian abscess – a case report and review

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Background: Genital tract infections in females secondary to *Streptococcus pneumoniae* (pneumococcus) are unusual. Tubo-ovarian abscess resulting from such an infection is a rare occurrence and diagnosis is not always easy. This report demonstrates the problems of recognizing this condition and summarizes the pathomechanism, investigations leading to a diagnosis and the subsequent management.

Case: A rare case of a tubo-ovarian abscess caused by pneumococcus, occurring in a previously healthy 48-year-old woman, is presented. The tubo-ovarian abscess may have developed insidiously and probably had an acute exacerbation prior to presentation.

Conclusion: This case is unusual in that there were no identifiable initiating events for the source of the pneumococcal infection. Early recognition of a tubo-ovarian abscess is important in order to prevent the associated morbidity and mortality. This condition has the propensity to mimic a neoplasm.

Key words: *STREPTOCOCCUS PNEUMONIAE*; GENITAL TRACT INFECTION; CA125

INTRODUCTION

Streptococcus pneumoniae can cause a wide range of infections such as meningitis, sinusitis, otitis media, pneumonia, endocarditis, septic arthritis and peritonitis. The female genital tract has only rarely been involved as the primary site¹, possibly as they are inhibited by the acidity of the vagina². Once colonized, the organisms may ascend to result in inflammation extending from the fallopian tubes into the ovarian parenchyma, leading to suppuration and abscess formation³. Tubo-ovarian abscess may also occur as a result of a stromal invasion of bacteria through lymphatic or hematogenous spread⁴, or by surgical trauma or ovulation, which results in the loss of ovarian capsule integrity⁵. Between 3–16% of hospitalized women with salpingitis develop a tubo-

ovarian abscess^{6–8}. The clinical diagnosis may be correct in only one third of cases⁷, and may constitute up to 2% of all gynecological hospital admissions⁹.

CASE REPORT

A 48-year-old woman self referred to the emergency gynecological assessment room with a 3 week history of lower abdominal pain and intermenstrual bleeding. She had previously been treated empirically with antibiotics for a urinary tract infection whilst on holiday in Spain. She had two children (both delivered by Caesarean section and one pregnancy resulted in a termination), and had been sterilized. Her periods were irregular and a cervical smear carried out 2 years earlier was reported as normal. She was hypertensive,

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suffered from psoriasis and was on methotrexate (10 mg once weekly) and folic acid, and had been for about 6 years.

On examination she was afebrile and hemodynamically stable. Abdominal palpation revealed a tender 14-week-sized mass arising from the pelvis. This was confirmed on vaginal examination. The uterus was acutely retroverted with the cervix deviated to the right side of the pelvis by a 10 cm left-sided pelvic mass. There was no history of vaginal discharge. A pregnancy test was negative and blood tests revealed a raised white cell count of 22.3 (normal value $4-11 \times 10^6$) with a predominant neutrophilia (17.8). CA125 was 38 u/ml (normal < 35 u/ml). A high vaginal swab culture grew lactose fermenting coliform and enterococcus species, and the endocervical swab for chlamydia (chlamydial PCR) was negative. Vaginal ultrasound demonstrated a $72 \times 46 \times 51$ mm loculated cystic structure in the left adnexae. There was no free fluid in the pelvis.

The patient was referred to the consultant gynecological oncologist surgeon. A laparotomy was carried out 3 weeks after her clinic appointment. She received a dose of preoperative antibiotics (Cefuroxime 1.5 g and Metronidazole 500 mg. Through a midline incision a 10 cm left tubo-ovarian abscess with chronic fibrosis was found. The abscess involved the left side wall and uterus, with small and large bowel adherent. The left ureter was dilated above the mass and passed into the fibrosed lateral cyst wall. The right fallopian tube had a hydrosalpinx. The right ovary and the rest of the abdomen were normal. Following careful dissection, the left ureter was mobilized off the mass and total abdominal hysterectomy and bilateral oophorectomy were completed with omental and representative peritoneal biopsies. Pus from the mass was sent for culture and sensitivity. The patient was initially treated with Cefuroxime (750 mg three times a day) and metronidazole (500 mg three times a day) intravenously. Once the culture showed the presence of pneumococcus that is sensitive to penicillin, Augmentin (1.5 g three times a day, intravenously) was commenced. The patient made a quick recovery and following an uneventful postoperative period, was discharged

home on the seventh postoperative day. Pathological examination confirmed the operative findings of acute on chronic inflammatory changes suggestive of tubo-ovarian abscess with no evidence of malignancy.

DISCUSSION

This is a rare case report of a tubo-ovarian abscess secondary to pneumococcus, having developed insidiously. Previous case reports have described acute infections^{2,3}. Tubo-ovarian abscesses are usually the result of a mixture of anaerobic and aerobic organisms^{6,8,9} such as *Escherichia coli*, *Hemolytic streptococci* and *Gonococci*⁸, *Bacteroides species* and *peptococcus*^{8,10,11}. Isolated case reports of *Hemophilus influenzae*, *salmonella*, *actinomyces* and *staphylococcus aureus* causing tubo-ovarian abscess have been reported.

S. pneumoniae is not a part of the normal vaginal flora; therefore acquiring infection from this unusual pathogen is complex. Oro-genital contact with a carrier or upper respiratory infection may result in the transient colonization of the lower genital tract in females. Predisposing factors may include pelvic inflammatory disease, intrauterine contraceptive device, childbirth, medical termination and gynecological operations, thus facilitating abscess formation.

All tubo-ovarian abscesses, including those caused by pneumococcus, present with the following symptoms: pain 88%; fever 35%; adnexal mass 35%; diarrhea 24%; nausea and vomiting 18%; irregular menses 12%; and difficult voiding 6%¹². Once there is clinical suspicion of a tubo-ovarian abscess, then steps to establish the diagnosis must be made.

Ultrasound¹³ and CT scan^{13,14} are useful tools to identify an abscess in an appropriate clinical context, but they do not establish a definitive diagnosis. MRI provides an accurate localizing method in addition to providing anatomical information and biochemical function¹⁵. Radio-nuclide scanning using indium¹¹¹ is promising to be another accurate and excellent diagnostic tool¹⁶. Patients with a confirmed diagnosis or even some degree of suspicion, need hospitalization, close observation and commencement of

intravenous antibiotics effective against both aerobic and anaerobic bacteria. Most of these patients will require a surgical intervention as the efficacy of the antibiotics are reduced by the complex environment of the abscess¹⁷. This is a subject of much controversy since the advent of newer antibiotics and better diagnostic and interventional radiological tools. Surgical procedures performed range from posterior colpotomy to unilateral adnexectomy under aggressive antibiotic cover, with regular follow-up for women of reproductive ages, to total abdominal hysterectomy and bilateral salpingo oophorectomy in peri- and post-menopausal women¹⁸ to prevent recurrence. CT guided percutaneous drainage may decrease the necessity for surgery without adding to the risk of complications.

Postoperative complications include bowel injury, wound dehiscence, enterocutaneous fistula, deep vein thrombosis (DVT) and prolonged ventilatory support¹⁹. Complications as a result of the tubo-ovarian abscess in an acute setting include abscess rupture and bowel obstruction, with the risk of ectopic pregnancy and chronic pelvic pain in a delayed setting.

This case is intriguing for a number of reasons. The patient was peri-menopausal (48 years-of-age) and did not have any of the risk factors described above. Although she presented with pain, pelvic mass, discharge and irregular menses, she was afebrile in spite of an elevated white cell count (WCC). The patient was asymptomatic from the time of presentation to surgery and since she was afebrile no serial WCCs were done. Clinical and ultrasound examinations were unable to make a diagnosis of a tubo-ovarian abscess from other pelvic pathologies, including ovarian malignancy. A CT scan was not thought appropriate, as a preliminary ultrasound scan was done which defined the dimensions of the adnexal mass. The differential diagnosis included ovarian malignancy and a tubo-ovarian abscess. The possibility of a diverticular abscess was ruled out, as there was no prior history of diverticular disease.

In this patient, the portal of entry to the genital tract was not clear and her high vaginal swab did not reveal any *S. pneumoniae*. The genital tract was the portal of entry described in previous adult

case reports^{1,2}. Oral and nasal swabs were not obtained; therefore it is not clear whether she was or was not colonized with pneumococci, neither were any blood cultures done to check for any bacteremia. Anaerobic cultures were obtained during the surgery. Her urine culture was normal. She received a single dose of preoperative antibiotics and was also treated postoperatively with the antibiotics mentioned in the case report. *Streptococcus pneumoniae* can cause a wide range of infections such as meningitis, sinusitis, otitis media, pneumonia, endocarditis, septic arthritis and peritonitis. The female genital tract has only rarely been involved as the primary site¹, possibly as they are inhibited by the acidity of the vagina². Once colonized the organisms may ascend to result in inflammation extending from the fallopian tubes into the ovarian parenchyma leading to suppuration and abscess formation³. Tubo-ovarian abscess may also occur as a result of stromal invasion of bacteria through lymphatic or hematogenous spread⁴, or by surgical trauma or ovulation, which results in the loss of ovarian capsule integrity⁵. Between 3 and 16% of hospitalized women with salpingitis develop a tubo-ovarian abscess⁶⁻⁸. The clinical diagnosis may be correct in only one third of cases⁷ and may constitute up to 2% of all gynecological hospital admissions⁹.

The rise of CA 125 levels further complicate the clinical decision making, although it is known that elevated levels may occur in patients with pelvic inflammatory disease. This patient could also be immunocompromized due to treatment with methotrexate, however it was a low maintenance dose and thereby insufficient to cause fulminant bacteremia. Pus culture grew a pure growth of *S. pneumoniae*. Pneumococcal serotyping was not done, although it has been reported that common serotypes associated with this clinical setting are types 1, 3 and 7^{1,20,21}. The operative and pathological findings were suggestive of an abscess with an acute exacerbation on chronic inflammation. This patient's presentation is not only interesting but it is also a reminder that infections can mimic neoplasms and their diagnosis and management is equally important to reduce the associated morbidity and mortality.

REFERENCES

1. Westh H, Skibsted L, Korner B. *Streptococcus pneumoniae* infections of the female genital tract and in a new born child. *Rev Infect Dis* 1990;12:416–22
2. Nucklos HH, Hertig AT. Pneumococcus infection of the genital tract in women. *Am J Obstet Gynecol* 1938;35:782–93
3. Abalde M, Molina F, Guerrero A, et al. *Streptococcus pneumoniae* peritonitis secondary to a tubo-ovarian abscess. *European J Clin Micro Infect Dis* 1998;17(9):671–3
4. Wechler SJ, Dunn LJ. Ovarian abscess – report of a case and review of literature. *Obstet Gynecol Survey* 1985;40:476–85
5. Wilson JR, Black JR. Ovarian abscess. *Am J Obstet Gynecol* 1964;90:33–4
6. Nebel WA, Lucas WE. Management of tubo-ovarian abscess. *Obstet Gynecol* 1968;32:382–6
7. Clark JFJ, Moore Hines S. A study of tubo-ovarian abscess at Howard University Hospital (1965–1975). *J Natl Med Ass* 197;71:1109–11
8. Landers DV, Sweet RL. Tubo-ovarian abscess: contemporary approach to the management. *Rev Infect Dis* 1983;5:876–84
9. Mickal A, Sellmann AA. Management of tubo-ovarian abscess. *Clin Obstet Gynecol* 1969;12:252–64
10. Altemeir WA. The anaerobic streptococci in tubo-ovarian abscess. *Am J Obstet Gynecol* 1940;39:1038–42
11. Sweet RL. Treatment of mixed aerobic and anaerobic infections of the female genital tract. *J Antimicrob Chemother* 1981;8:105–14
12. Schmidt E, Nehra P. Tubo-ovarian abscess, a study of 17 patients. *Am Family Physician* 1988;37(4):181–5
13. Mueller PR, Simeone JF. Intraabdominal abscesses; diagnosis by sonography and CT. *Radiol Clin North Am* 1983;21:425–43
14. Wilbur A. Computed tomography of tubo-ovarian abscesses. *J Comp Assis Tomo* 1990;14(4):625–8
15. Ha HK, Lim GY, Cha ES, et al. MR imaging of tubo-ovarian abscess. *Acta Radiologica* 1995;36(5):510–4
16. Carrol B, Silvermann PM, Goodwin DA, et al. Ultrasonography and indium¹¹¹ white blood cell scanning for the detection of intra-abdominal abscesses. *Radiology* 1981;140:155–60
17. Pastroek JG, Faro S. Surgical management of pelvic abscess. *Infect Surg* 1984;4(6):440–6
18. Manara LR. Management of tubo-ovarian abscess. *J Am Osteopath Assoc* 1981;81:476–80
19. Tyrell RT, Murphy FB, Bernardino ME. Tubo-ovarian abscesses. CT-guided percutaneous drainage. *Radiology* 1990;175(1):87–9
20. Lipscomb GH, Ling FW. Tubo-ovarian abscess in post menopausal patients. *Southern Medical J* 1992;85(7):696–9
21. Hadfield TL, Neafie R, Lanoie L. Tuboovarian abscess caused by *Streptococcus pneumoniae*. *Human Pathol* 1990;21:1288–9

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