Postmenopausal Tubo-Ovarian Abscess with Air in the Ovarian Vein

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ABSTRACT

Tubo-ovarian abscess (TOA) is usually recognized as a complication of pelvic inflammatory disease and highly associated with sexual activities in reproductive age group. However, even rare, TOA can be presented in a woman with genitourinary malignancy, diabetes mellitus, and usage of intrauterine device (IUD) in postmenopausal age group. Air in ovarian vein is a rare CT finding of TOA. We present the case of an 81-year-old woman with TOA from actinomycosis and E. coli, which was not associated with history of malignancy, diabetes mellitus and usage of IUD. The uncommon CT findings such as air-fluid level, intramural air, and air in the ovarian vein are also presented.

CASE REPORT

An 81-year-old woman with history of atrial fibrillation was presented in our emergency department with the chief complaint of abdominal pain for days. The patient had history of old cerebral vascular accident with dementia and hemiplegia. Physical examination showed hypoactive bowel sound, diffuse abdominal tenderness, muscle guarding and rebounding pain. The patient had no history of surgery and her family history was non-contributory. Otherwise, there was no nausea, vomiting, constipation, diarrhea, fever, or urinary symptoms. The white blood cell count was 9000 cells/mm3.

The supine abdominal radiograph of this patient was unremarkable. Contrast-enhanced CT showed a cystic lesion in the pelvic cavity with air-fluid level, diffuse intramural...
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air, and intravascular air in the left ovarian vein. Intraperitoneal free air was also identified, suggesting rupture of the lesion into the peritoneal cavity with peritonitis (Fig. 1).

The patient underwent left salpingo-oophorectomy and a perforated, gangrenous ovarian mass was found without evidence of adnexal torsion. Severe adhesion between the mass and the sigmoid colon was also noted; perforation of the sigmoid colon was identified and then being repaired during surgery. The histopathologic examination disclosed actinomyces-like organism in the lesion (Fig. 2). The ascites culture yielded E. coli. After surgery, the patient was discharged in stable condition.

Figure 1

Figure 1. a. Contrast-enhanced CT scan in axial section shows a cystic mass in the lower pelvic cavity with air-fluid level and diffuse intra-mural gas (* asterisk). Minimal ascites also noted in the Cul-de-sac. b. Contrast-enhanced CT scan in coronal section shows the TOA (*) and minimal air in the left ovarian vein. c. Intraperitoneal free air indicates rupture of the lesion (arrows). d. The curved multi-planar reconstruction shows intravascular air in the left ovarian vein (arrows).
DISCUSSION

Preoperative diagnosis of TOA is a challenge to radiologists, and it is more difficult in the elder woman due to low incidence in this age group. The most common CT finding of TOA is a thick-walled pelvic mass with internal septations [3-6]. Other features include thickening of the anterior wall of the abscess, satellite tubular cysts, and internal air [5]. However, a TOA from actinomycosis usually presents as a solid, invasive adnexal mass on CT scan, and usually mimics malignancy [6]. In our case, the CT features are not typical for actinomycosis. We propose a reasonable mechanism to explain the atypical emphysematous presentation of TOA from actinomycosis, adhesion of the sigmoid colon, and E. coli found in the ascites. At the beginning, the infiltrative actinomycosis of ovary invaded the sigmoid colon, and then subsequently superimposed infection of gas-forming E. coli from gastrointestinal tract. Therefore, the emphysematous TOA ruptured and caused peritonitis and intraperitoneal free air.

The pathogenic mechanism of intravenous air is rarely discussed in TOA. In contrary to the gastrointestinal conditions, Sebastia et al. concluded the three primary factors of portomesenteric vein air: intestinal wall alternations describe that ulcerative, ischemic, and inflammatory conditions increase the permeability of from bowel to veins; bowel distension describes that air pressure causes minimal disruption of the bowel mucosa; and abdominal sepsis describes septicemia in small veins and increased intraluminal fermentations of carbohydrates due to bacteria [7]. The first theory (ischemic condition enhancing the permeability to veins) can explain the old believe of the ovarian vein gas as an exclusive sign of adnexal torsion [8]. And, the third theory (septicemia in small veins and increased fermentations) can answer the ovarian vein gas in our case. However, the second theory (increased air pressure) is the most plausible explanation of intravenous air in TOA.

Figure 2. a. Low-power photomicrograph with hematoxylin-eosin stain shows hemorrhage and gangrenous change of the cystic wall. b. High-power photomicrograph shows neutrophilic debris. c. High-power photomicrograph also shows Actinomyces-like bacterial colonies in the fallopian tube and uterus.
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pressure causing disruption of the mucosa) can be applied in both conditions of adnexal torsion and emphysematous TOA. To our knowledge, the complications such as pulmonary air embolism from ovarian vein gas have not been reported in English literature. We believe that the gradually released, small amount of intravenous air will be filtered by pulmonary vasculature, and may not cause severe results. Instead of air in the ovarian vein, rupture of the TOA with peritonitis, which might result mortality, should had the highest priority in treatment in our case.

TOA from actinomycosis is highly associated with the usage of IUD in both premenopausal and postmenopausal groups [6, 9]. The incidence of genital actinomycosis remains high even after removal of the IUD [9]. In our case, there is no history of IUD usage.

In conclusion, we present a rare condition of TOA in a postmenopausal woman without associated genitourinary malignancy, diabetes, or IUD usage. The uncommon CT finding of air in the ovarian vein can be explained by the theories for portomesenteric vein gas—septicemia in veins and increased fermentations due to bacteria; and increased intraluminal air pressure pushes the air to the veins. Both actinomycetes and E. coli were believed as the causes of TOA in our patient. And E. coli is more commonly associated with gas-forming infection than actinomycetes. Additionally, we should routinely check the ovarian vein in a female patient with a pelvic mass. The presentation of air in the ovarian vein can helpfully narrow the differential diagnosis into adnexal torsion and emphysematous TOA.

REFERENCES