Case 14163

Female genital tuberculosis
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Section: Genital (female) imaging
Area of Interest: Lung Mediastinum Genital / Reproductive system female
Procedure: Diagnostic procedure
Technique: CT
Special Focus: Infection Case Type: Clinical Cases
Authors: Tonolini Massimo, MD; Bonzini Miriam, MD.
Patient: 58 years, female

Clinical History:

A postmenopausal G9 woman with unremarkable past medical history, and recently discharged from another Hospital after treatment of urinary tract infection, was sent by another gynecologist to our emergency department because of suspected pyometra and indeterminate adnexal masses. No significant physical findings were seen, in particular fever or vaginal discharge.

Imaging Findings:

Further questioning revealed that the patient's husband was treated for tuberculosis a year earlier in their native country (Albania).
Initial CT (Figs.1, 2) showed bilateral adnexal enlargement with 20-24 Hounsfield units internal attenuation and peripheral enhancement, dilated uterine cavity by similar hypattenuating content with thin endometrial enhancement, and omental infiltration. Ascites, adenopathies, abnormalities of upper abdominal and urinary organs were absent. Scattered infracentimetric non-cavitated nodules in both upper lung lobes and a partially necrotic mediastinal adenopathy were seen.
QuantiFERON-TB assay tested positive for tubercular infection, but the purulent-necrotic material from the endometrial biopsy did not harbour microscopically detectable organisms. After the start of anti-tubercular combination therapy, polymerase-chain reaction (PCR) for Mycobacteria on DNA extracted from endometrial biopsy samples confirmed diagnosis of genital tuberculosis.
Early follow-up CT (Figs.3, 4) showed minimal decrease of some lung nodules, reduced uterine dilatation with persistent endometrial enhancement, stable adnexal lesions and omental infiltration.

Discussion:

Despite effective therapies, tuberculosis remains a major health problem, particularly in regions with a concentrated population, poor sanitation and unfavourable social and economic conditions. During the last decade, tuberculosis had a resurgence because of migrations, the HIV epidemic and drug-resistant bacilli. After the lymph nodes, urogenital tuberculosis (UGTB) is the second commonest extrapulmonary pattern, accounting for 27% of cases. Albeit the vast majority of cases occur in developing countries, UGTB is occasionally encountered in non-endemic regions, particularly in immigrants and immunosuppressed individuals [1-4].
UGTB results from hematogenous spread and subsequent reactivation of Mycobacterium tuberculosis, develops several (up to 20-25) years after primary infection and therefore presents in adulthood, often without history or radiographic evidence of lung infection. Sexual transmission rarely occurs in partners of patients with UGTB. Isolated genital involvement is an uncommon (5%) UGTB pattern which generally affects childbearing-age women and manifests with chronic pelvic pain, amenorrhea or abnormal menstruation; microscopic haematuria, irritative
voiding and constitutional symptoms often coexist. UGTB accounts for 1%, 7.4% and 18% of infertile women in the USA, Turkey and India, respectively. Diagnostic confirmation relies on demonstrating Mycobacteria in urine, cultures and polymerase chain reaction assays [4-6].

Female UGTB affects the fallopian tubes (in almost 95% of patients), endometrium (50-60%), ovaries (20-30%), cervix (5-15%), myometrium (2.5%), and vulva/vagina (1%) in descending order of frequency [1, 5, 7]. Traditionally, hysterosalpingography revealed deformity and obliteration of the endometrial cavity, multifocal strictures of the fallopian tubes. Currently, using multiplanar reconstructions cross-sectional CT imaging clearly elucidates the genital organs: UGTB shows up as uni- or bilateral dilated, pus-filled fallopian tubes or complex thick-walled, internally hypoattenuating adnexal masses with septations or fluid-debris level; the latter appearance closely resembles pyogenic tubo-ovarian abscesses and may be misinterpreted as ovarian tumours. From the adnexa, trans-serosal spread of infection leads to peritonitis and endometritis, with corresponding appearance of dilated endometrial cavity with hypodense fluid content. Tuberculosis is suggested over pyogenic infection by the presence of concurrent disease localizations in the lungs, mediastinal or neck lymph nodes, peritoneum and omentum, urinary tract, abdominal nodes, liver and spleen, occasionally central nervous system or spine [7-14].

To prevent unnecessary surgery, aware radiologists should include UGTB in the differential diagnosis of adnexal masses, particularly in HIV-positive young adult females, even when ascites and omental changes suggesting carcinomatosis are present [15, 16].

UGTB requires prolonged therapy with multidrug regimens analogous to those used to treat lung tuberculosis [1, 3-6].

Differential Diagnosis List: Female genital (adnexal and endometrial) tuberculosis, Pyogenic endometritis and tubo-ovarian abscesses in pelvic inflammatory disease, Actinomycosis, Cystic ovarian tumour, Krukemberg type metastases, Complicated (abscessual) diverticulitis or appendicitis

Final Diagnosis: Female genital (adnexal and endometrial) tuberculosis

References:

Description: In both upper lobes, scattered infracentimetric non-cavitated nodules were present, best appreciated with maximum-intensity projection (MIP) reconstruction (b). Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Multiplanar post-contrast images showed bilateral adnexal enlargement (+) with hypoattenuating (20-24 Hounsfield units, HU) content and uniform peripheral enhancement. No ascites and adenopathies were present. **Origin:** Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
Description: Bilateral adnexal enlargement (+) with hypoattenuating (20-24 HU) content and peripheral enhancement. Dilated uterine cavity (*) by similar hypoattenuating content with thin endometrial enhancement (thin arrows). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Dilated uterine cavity (*) by similar hypoattenuating content with thin endometrial enhancement (thin arrows). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Additionally, omental hazy infiltrate (arrowhead) was present. Note thin endometrial enhancement (thin arrows), 4 cm right-sided adnexal enlargement (+) with hypoattenuating (20-24 HU) content and peripheral enhancement. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
Description: Additionally, moderate omental hazy infiltrate (arrowheads) was present. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Figure 3

Description: Repeated CT including MIP reconstruction (b) showed minimal size decrease of some of the non-cavitated nodules scattered in both upper lung lobes. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
**Description:** The solitary mediastinal adenopathy (thick arrow) showed stable size and persistent necrosis. **Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Multiplanar post-contrast images showed decreased uterine dilatation (*) compared to Fig. 1 with persistent endometrial enhancement (thin arrow), unchanged adnexal lesions (+) and omental infiltration (thick arrow). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Multiplanar post-contrast images showed decreased uterine dilatation (*) compared to Fig.1 with persistent endometrial enhancement (thin arrow), unchanged adnexal lesions (+). **Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Multiplanar post-contrast images showed unchanged adnexal lesions (+) and omental infiltration (thick arrow). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)