Pelvic actinomycosis: MR findings and the differentiation from invasive pelvic malignant tumor

Poster No.: C-1761
Congress: ECR 2015
Type: Scientific Exhibit
Authors: F. Uchiyama; Ota-ku/JP
Keywords: Pelvis, MR, Surgery, Abscess
DOI: 10.1594/ecr2015/C-1761

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR's endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.

As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is strictly prohibited.

You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys' fees, arising from or related to your use of these pages.

Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.

www.myESR.org
Aims and objectives

Pelvic Actinomycosis is one of pelvic infectious disease, caused by Actinomyces israelii, a gram-positive anaerobic bacterium, that is a normal inhabitant of the upper intestinal tract in humans (1). The presence of a long-standing intrauterine device (IUD) is known to be a risk factor in pelvic actinomycosis (2), however pelvic actinomycosis is difficult to diagnose pre-operatively and is often misdiagnosed, because Actinomycosis can mimic pelvic and abdominal invasive malignancies.

The purpose of this study was to evaluate MR findings of our pelvic actinomycosis cases and to investigate differentiation from invasive pelvic malignant tumor.

Methods and materials

• Between May 2011 to November 2014, three patients were proved pelvic actinomycosis histopathologically, (3 women ; age range, 42-65 years old; mean age, 57.3 years old). (table.1)
• Pelvic malignant tumor was proven pathologically in 11 patients (11 women ; age range, 28-91 years old; mean age, 68.3 years old).
• All pelvic actinomycosis patients underwent pelvic MR, MR examination consists of diffusion-weighted images (DWI), T1 and T2-weighted images and Gd-T1WI.
• We choose 11 women pelvic malignant patients who underwent MR examination, and we compared pelvic actinomycosis and pelvic malignancy.
• MR examinations were performed with 1.5 Tesla (MAGNETOM Vision/Avanto, Siemens) or 3.0 Tesla (MAGNETOM Trio A Tim, Siemens).
• Clinical features and MR findings were evaluated retrospectively.

Results

Actinomyces was detected by combined cervical and endometrial cytology (Fig4) and received antibiotic therapy (aminobenzylpenicillin). 2 of 3 were improved inflammation and minimized abscess on following 6 months MRI, however 1 of 3 has no effect on antibiotic therapy and removed surgically. Pelvic actinomycosis patients consists of following three.

Case1 (Fig1)
A 65-year-old female, gravida 2, para 2, complained of persistent fever of 38.0#. Pelvic invasive lesion and right hydronephrosis were diagnosed on whole body CT. She was initially diagnosed rectal carcinoma and underwent colon fiber but there was no malignancy on cytology. Gynecological inquiries unveiled that the patient had been using IUD for 30 years and left alone.

A cervical smear showed dark cotton ball-like bacterial colonies with protruding a filamentous structure, highly suggestive of Actinomyces species infection. Based on the MRI and cytopathological result, we diagnosed pelvic Actinomyces infection associated with the long-standing IUD. Ten days after admission, IUD was removed, and intravenous aminobenzylpenicillin (4 g/day) was initiated for 2 weeks.

Case2 (Fig2)

A 42-year-old female who complained of lower abdominal pain, was referred with suspected perirectal abscess from a previous hospital. In the history of this patient, An intrauterine device (IUD) had been placed 7 years previously and left alone. It was removed by previous hospital. There had been no previous surgery or other severe disease in this patient. Same as case 1, based on the MRI and cytopathological result, we diagnosed pelvic Actinomyces infection associated with the long-standing IUD. Intravenous aminobenzylpenicilllin (4 g/day) was initiated for 2 weeks.

Case3 (Fig3)

A 65-year-old female, gravida 2, para 2, complained of lower abdominal pain. Pyometra and hydronephrosis of the right kidney was diagnosed on CT.

An intrauterine device (IUD) had originally been placed 28 years previously and left alone. Same as case 1, based on the MRI and cytopathological result, we diagnosed pelvic Actinomyces infection associated with the long-standing IUD.

Intravenous aminobenzylpenicillin (4 g/day) was initiated for 2 weeks, but antibiotic therapy was not effective and pyometra was not improved, finally resected by surgically.

1. MR findings in Pelvic actinomycosis (table1)

A) detection of IUD

Intrauterine devices (IUD) was detected in pelvic actinomycosis patients as a low intensity objects. In Japan, 97 in 107 pelvic actinomycosis were long-standing IUD users, and mean is 9.8 years (17months to 30 years).(3)

B) tissue infiltrative change
Actinomycosis usually manifests with several features, such as abscess formation, dense fibrosis, and product tissue-detructive protein, and form infiltrative change. This tissue-infiltrative change are similar to pelvic malignancy and difficult to diagnose pre-operatively and is often misdiagnosed.

C) the presence of abscess

Pelvic abscess was detected in all patients and showed as a high intensity on DWI. Pelvic Actinomycosis has micro abscess and micro granulation, and they reflect scattering high intensity on diffusion weighted imaging.

2. Differentiation from pelvic malignancy (table2)

We investigated 11 pelvic malignancy patients, and compared pelvic malignancy and pelvic actinomycosis. Pelvic actinomycosis has abscess as a non-enhancement lesion on Gd-T1WI and high intensity on DWI. In contrast, Pelvic malignancy has enhancement tumor on Gd-T1WI, and high intensity on DWI match to its enhanced lesion. Combination of DWI and Gd-T1WI is useful for differentiating pelvic actinomycosis and invasive pelvic malignant tumor.(1)

Images for this section:
**Figure.1 (case1 65Y)**

![Figure.1 (case1 65Y)](image)

**Fig. 1**: Figure.1 (case1. 65Y) a. axial T2WI visualized a foreign body that was later identified as an IUD (indicated by a blue arrow) inside the uterus b. Gd-T1WI c. DWI d. ADC e. Sagittal T2WI visualized a foreign body that was later identified as an IUD (indicated by a blue arrow) inside the uterus
**Fig. 2:** Figure.2 (case2 43Y) a. axial T2WI b. Gd-T1WI c. DWI high intensity on abscess d. ADC very low intensity e. Sagittal Gd-T1WI
**Fig. 3:** Figure.3 (case3 65Y) a. axial T2WI b-d douglas’ abscess (b. Gd-T1WI c. DWI high intensity on abscess d. ADC very low intensity) e-g infiltrative change (e. Gd-T1WI f. DWI g. ADC)
Fig. 4: Actinomyces was detected by combined cervical and endometrial cytology.
**Table 1**

<table>
<thead>
<tr>
<th>age</th>
<th>symptom</th>
<th>WBC/CRP</th>
<th>term of IUD (years)</th>
<th>detection of IUD</th>
<th>infiltrative change</th>
<th>reduction of ADC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>fever</td>
<td>13,900 / 5.48</td>
<td>30</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>2</td>
<td>abdominal Pain</td>
<td>20,400 / 10.21</td>
<td>7 removed</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>abdominal Pain</td>
<td>26,000 / 21.6</td>
<td>28</td>
<td>+</td>
<td>+++</td>
<td>+</td>
</tr>
</tbody>
</table>

+++ : markedly
++  : moderately
+   : slightly

**Table 1**: Table.1 case1-3 clinical features and MR image findings
Table 2: Differentiation from pelvic malignancy

<table>
<thead>
<tr>
<th></th>
<th>pelvic actinomycosis</th>
<th>pelvic malignancy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>infiltrative lesion</td>
<td>abscess</td>
</tr>
<tr>
<td>ADC</td>
<td>slightly decreased</td>
<td>markedly decreased</td>
</tr>
<tr>
<td>Gd-T1WI</td>
<td>slightly-enhanced</td>
<td>non-enhancement</td>
</tr>
<tr>
<td>IUD</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>symptom</td>
<td></td>
<td>fever, abdominal pain, constipation</td>
</tr>
<tr>
<td>clinical course</td>
<td>chronic</td>
<td>chronic</td>
</tr>
<tr>
<td>WBC / CRP</td>
<td>markedly increased</td>
<td>markedly increased</td>
</tr>
</tbody>
</table>

pelvic actinomycosis (case2)  
pelvic malignancy (84Y rectal carcinoma)
Conclusion

MR findings in pelvic actinomycosis are following three points, detection of IUD, infiltrative changes, and the presence of the abscess. And invasive pelvic malignant tumor were very similar reflecting the infiltrative mass, however pelvic actinomycosis has abscess as a non-enhancement lesion and high intensity on DWI. Combination of DWI and Gd-T1WI is useful for differentiating pelvic actinomycosis and invasive pelvic malignant tumor.

Personal information

References


4) Fujiwara M et al. Pelvic actinomycosis ten cases, clinical analysis
