

Combined Therapies in Abdominal Actinomycosis

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This study is about a 43-year-old woman with anterior abdominal wall actinomycosis that appeared after abdominal trauma by dropping. The histopathological examination revealed an organized parietal hematoma with Actinomyces israelii colonies. The evolution was favorable under the treatment with Penicillin G. 5000000 International Units administered by intravenous infusion every 6 hours for 4 weeks and with orally administered Oспен for eight weeks more. In conclusion, the combined surgical drainage with antibiotic treatment proved to be an optimal therapy for patients with abdominal actinomycosis.

Keywords: Actinomyces israelii, abdominal traumatism, tumoral mass, penicillin

Actinomycosis is a rare, chronic debilitating disease, characterized by a granulomatous infection being caused by *Actinomyces species* [1, 2]. The most common etiologic agent of actinomycosis is *Actinomyces israelii*. *Actinomyces species* represent a group of anaerobic, Gram-positive, filamentous bacteria that normally colonize the respiratory, gastrointestinal and female genitourinary systems [3-5]. Actinomycosis have predilection for cervicofacial (50%), abdominal (20%) and thoracic (15%) regions. Moreover, it, occasionally, affects the anterior abdominal wall or viscera, being hardly diagnosed [2]. In the present paper, we report a case of anterior abdominal wall actinomycosis occurred after abdominal trauma by falling in the gutter line.

Experimental part

Materials and methods

The hemoleucogram parameters were assessed by using a hematology ADVIA[®]2120i analyzer. The laboratory tests were determined by enzymatic methods (quantitative technique) using a Vitros[™]750drySlides analyzer. They were correctly identified at the genus level with the Vitek 2 system ANC Card ATCC 12102 (colorimetric identification card, bioMérieux, Marcy-France).

Case report

This case report presents a 43-year-old woman from an urban area, who was hospitalized in the Surgery Department of Dr. Carol Davila Clinical Hospital, Bucharest, Romania on the 4th of November 2014. The patient visited the family physician one week before accusing abdominal pain in the lower quadrant and progressive abdominal discomfort. The patient has never been recorded with any history of chronic disease. The patient presented abdominal

pain, discomfort and pressure in the left paraumbilical region with extension to the left abdominal flank, being suspected of having a tumor. On palpation, the doctor identified in the left subumbilical region, a tender tumoral mass of firm consistency, painful at deep pressure on the lower area of the abdomen, thereby the patient was asked to perform an abdominal magnetic resonance imaging (MRI). No signs of peritoneal irritation were noted and laboratory tests were normal.

Three months prior to the current admission, the patient suffered an abdominal trauma, from falling in an uncovered manhole of a gutter line on the street.

The MRI using contrast substance performed on the 26th of October 2014 showed an imprecise contoured image, 94.1/76.1/47.5mm in dimensions with hypo/hypersignal at the T1, T2 and TIRM (turbo inversion recovery magnitude) levels with interrupted continuity of muscular fibers in the left rectus abdominis muscle at 7 cm distance from the distal insertion. Diffuse interstitial edema at the level of the left side of rectus abdominis muscle and partially at the level of the right side of rectus abdominis muscle, having the aspect of hematic infiltration is presented in figure 1 and 2. According to the MRI using contrast agents, a non-homogenous appearance was observed. The lesion extended deeply percolating the abdominal wall, the omentum and the loco-regional of the intra-abdominal fat tissue.

Results and discussions

The patient has been hospitalized at the Surgery Clinics of Dr. Carol Davila Clinical Hospital in Bucharest on the 4th of November 2014. At the admission, the patient presented abdominal pain, discomfort and pressure in the left paraumbilical region with extension to the left abdominal

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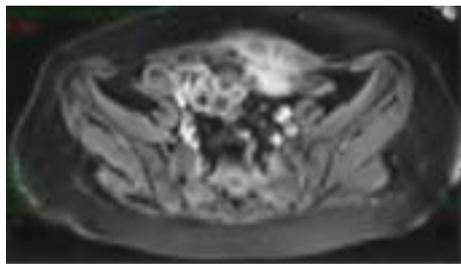


Fig. 1 MRI: an imprecise contoured image, 94.1/76.1/47.5 mm in dimensions with hipo/hipersignal at the T1, T2 and TIRM levels with muscular fibres continuity interruption on the left rectus abdominis muscle at 7 cm from the distal insertion. It was also found a diffuse interstitial oedema at the level of the left side of rectus abdominis muscle and partially at the level of the right side of rectus abdominis muscle, having the aspect of haematic infiltration

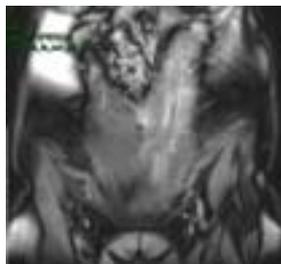


Fig. 2. MRI: By administering contrast agent intravenously an inhomogenous contrast was noticed. The lesion extended deeply percolating the abdominal wall, the omentum and the locoregional intra-abdominal fat tissue

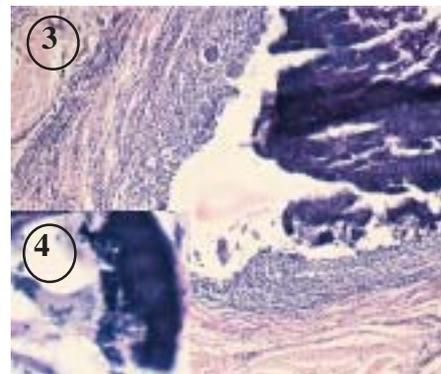


Fig. 3. Actinomycotic granuloma centered by *Actinomyces israelii* colony. Detail (HE x 200).

Fig. 4. Actinomycotic granuloma centered by *Actinomyces israelii* colony (HE x 100).

flank. The surgeon identified through palpation, a tender tumoral mass of 8/6 cm of firm consistency in the left subumbilical region, which was adherent to the surrounding areas. No signs of peritoneal irritation were noticed. The gastrointestinal transit was normal. The admission laboratory tests showed that the leukocytes, red cells, hemoglobin, platelets, blood sugar, urea, creatinine, alanine aminotransferase (ALT), aspartate aminotransferase (AST), Na, K, Ca, Cl, serum total protein, were normal. The adherences were removed by surgical intervention and a cross-cut subumbilical incision in the tumor was performed. It was observed an altered subcutaneous cell tissue having an inflammatory aspect which was removed. The left side of rectus abdominis muscle showed fibrous changes and was edematous. A muscular biopsy was taken and sent for a histopathologic examination, which revealed that the source of the examined tissue is from an organized parietal hematoma, surrounded by a xantogranulomatous inflammation extending to the adjacent adipose tissue where has been developed a process of septal panniculitis. There have also been found colonies of *Actinomyces* in the interior of the hematoma (fig. 3, fig. 4). The conclusion of the histopathologic examination revealed an organized parietal hematoma with colonies of *Actinomyces*.

The patient has received antibiotic treatment with Ceftriaxone (2x2g/day) for 10 days to prevent postoperative infections. Proper wound care was taken daily. The postoperative evolution was favorable. The biological examinations conducted on the 11th of November 2014 before the discharge of the patient were normal.

Hence, on 15th of November 2014 the patient was transferred to the Infectious Disease Department to start the therapy for actinomycosis. The postoperative wound was about to be scarred and the intestinal transit was normal. The laboratory tests conducted on the 17th of November 2014 showed leukocytes=10700/ μ L (normal range 4000-10000/ μ L) with PMN 76.6% (normal range 50-55%) and ESR=40mm at 1h (normal range 6-15 mm at 1h). We also found a hypercholesterolemia of 282 mg% (natural range 0-200 mg/dL). The rest of the laboratory tests were normal.

The following treatment was initiated: intravenous Penicillin G 5000000 IU every six hours for 28 days, a probiotic (Eubiotic, 2 capsules/day) and Metamizole. After 4 days of treatment the patient had no fever, the abdominal pain disappeared gradually and the laboratory tests were normal. The patient was discharged on 6 December 2014

with the recommendation to continue the antibiotic treatment with Ospen (penicillin 1 capsule=1MIU), 4x1 capsule/day for 8 weeks together with Eubiotic (2x1 capsule/day). It was also recommended a low animal fat diet to control the hypercholesterolemia and also to avoid the intense physical activity.

The clinical re-evaluation and follow-up of the patient after one year after the surgery revealed no complications, or relapses seen, indicating that the patient was cured.

Actinomycosis, a pseudotumoral disease caused by an anaerobic gram positive bacteria, called *Actinomyces israelii* is usually rare in developed countries [5, 6]. Actinomycosis has a worldwide distribution and can affect any age group, regardless of race or geographical area, the reported annual incidence of actinomycosis being approximately 1/300,000 [3, 9]. Preoperative diagnosis has been very rare reported, only in 10% of cases [3, 10]. According to the statistics, the mortality of patients with actinomycosis is between 0% to 28%, depending on the site of infection and also on the time of diagnosis, the highest mortality rate being observed in CNS involvement cases [5, 8, 13, 14].

After penetrating the mucosa, the bacteria induce an inflammatory process with pseudo-tumors or abscesses [6]. Most of the actinomycosis cases (50%) have affected the head and the neck and only 20% have involved the abdomen. The most commonly affected organs are the appendix, caecum, colon, stomach, liver, pancreas, anorectal region, pelvis and abdominal wall [6, 7].

Risk factors for abdominal actinomycosis are recent abdominal surgical interventions or trauma, invasive abdominal exploration procedures, endoscopic manipulation, intra-abdominal malignancy tumors, perforations organs, etc. Women with intrauterine contraceptive devices have also presented a higher risk [3, 8].

We report a case of woman with anterior abdominal wall actinomycosis occurred after 3 months of abdominal trauma by falling in the gutter line. As we know, this is the first case of abdominal wall actinomycosis, appeared after a trauma, in western Romania. The clinical spectrum of actinomycosis is nonspecific, including pain, weight loss, anorexia, fever, chills, constipation, diarrhea, abdominal discomfort, palpable mass or fistulas in case of actinomycotic abscesses. Laboratory tests reveals leucocytosis, positive inflammation markers and, sometimes, anemia [2, 7, 9].

In our case we noticed that the patient had only

progressive abdominal pain associated with discomfort and pressure in the left inguinal flank. The patient presented abdominal pain, discomfort and pressure in the left paraumbilical region with extension to the left abdominal flank, being suspected of having a tumor. Because she was afraid of having a malignant tumor she visited her physician, which proceeded all the needed investigations and tests and eventually she decided to have the surgery. Laparoscopic surgery was performed, and an adherent parietal omentum block belonging to the left iliac fossa was found. The laboratory tests showed only a mild leukocytosis with neutrophilia, which was treated with Penicillin.

The conditions for isolation and culture *Actinomyces israelii* are difficult because it needs over a week only for growing. In addition, the culture is negative in 76% of cases. The histopathological examination of the biopsy fragments remains gold standard in diagnosing the abdominal actinomycosis [2, 6, 10]. Microscopic examination reveals the characteristic sulphur granules containing filaments in 50% of the cases. These granules are PAS and Grocott positive, but the von Kossa reaction is negative [2, 3, 6, 10, 11].

These findings are not pathognomonic, because other species such as *Nocardia*, *Staphylococci* and *Streptomyces* can also produce sulphur granules [3, 6, 12]. Ehrlich-Ziehl-Neelson staining are used for the differential diagnosis of *Nocardia* and *Actinomyces* (negative for actinomycosis).

Abdominal actinomycosis should be differentiated from Crohn's disease, ulcerative colitis, diverticulitis, neoplasm, intestinal tuberculosis, and appendicitis [4, 8, 13].

Modern imaging investigations such as CT and MRI using contrast agents have an important role to establish the diagnosis of actinomycosis. In our case, the patient examination using MRI contributed to the screening of a diffuse interstitial edema at the level of the left side of rectus abdominis muscle and partially at the level of the right side of rectus abdominis muscle, having the aspect of hematic infiltration.

Laboratory tests have shown that *Actinomyces israelii* is susceptible to penicillin G. Therefore, the specialists recommend intravenous treatment with penicillin G, 10-20 MIU/day for 4 to 6 weeks, followed by oral penicillin V or amoxicillin 2-4 g/day for a period of 2-12 months. The long-term therapy with higher doses of penicillin allows

the drug to penetrate through the fibrotic wall of the abscess and to reach in the core of the sulfur granules of actinomyces organism [7, 11, 12]. The combined surgical drainage with antibiotics therapy has proved to be beneficial in the most of the cases [2, 6, 8, 12, 13].

For penicillin-allergic patients, therapists used doxycycline, minocycline, tetracycline, clindamycin, erythromycin, imipenem, cephalosporins and ciprofloxacin having good results [4, 5, 12, 13, 14].

In our opinion, we consider that this case was a success not only because of the therapeutic approaches, but also for the appropriate management concerning the positive and differential diagnosis. According to the other clinical studies, the prognosis was excellent when actinomycosis has been early diagnosed and when it was effectively treated [5, 8, 13, 14].

Conclusions

Abdominal actinomycosis continues to be a hardly diagnosed disorder because of its insidious course, non-specific symptoms and laboratory markers. Both the modern imaging investigations (CT, MRI with contrast) and the histological examination of biopsy specimens help to establish the diagnosis of abdominal actinomycosis. The antibiotic therapy combined with surgery represents a promising alternative to treat patients with abdominal actinomycosis.

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