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## CASE REPORT

# Erysipelothrix rhusiopathiae intra-abdominal abscess

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**Summary** *Erysipelothrix rhusiopathiae* is a Gram-positive bacillus that is infrequently responsible for infections in humans. Most human cases present as localized or generalized cutaneous infections. An invasive septic form, usually associated with endocarditis, has rarely been described. We report here an invasive infection caused by *E. rhusiopathiae* without endocardium involvement. To our knowledge, this is the first report of an intra-abdominal abscess due to this pathogen.

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**Introduction**

*Erysipelothrix rhusiopathiae* is a facultatively anaerobic Gram-positive bacillus that has long been recognized as the causative agent of swine erysipelas.<sup>1</sup> It was first reported as a human pathogen at the beginning of the last century.<sup>2</sup>

*E. rhusiopathiae*, and infections due to this organism, have a worldwide distribution. It has been found as a commensal or pathogen in a wide variety of vertebrate and invertebrate species.<sup>3</sup> Most human cases are related to occupational exposure (butchers, fishermen, fish handlers, veterinarians, housewives, etc.).<sup>3</sup> The majority of human infections fall into three main well-defined categories: (1) a mild localized cutaneous form (erysipeloid), (2) a general-

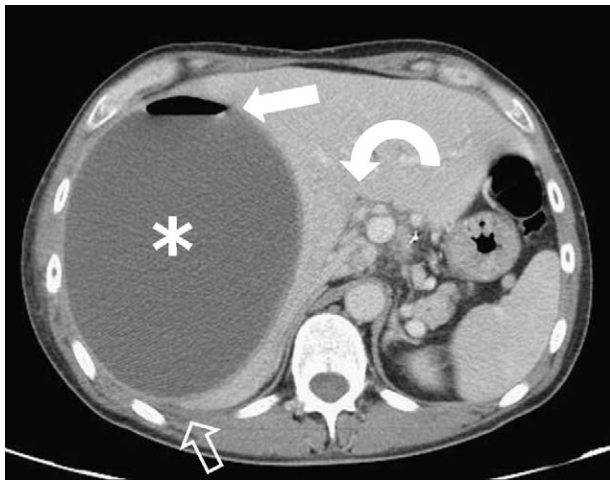
ized cutaneous form, and (3) an invasive septic form, usually associated with endocarditis.<sup>4</sup> The invasive form is associated with localized infection extremely rarely. Only exceptionally does the septic form involve sterile sites other than the endocardium, usually the bones and joints.<sup>5–9</sup>

To our knowledge this is the first report of an intra-abdominal abscess caused by *E. rhusiopathiae*.

**Case report**

A 42-year-old man from northern Italy and living in a village near the sea was admitted to the surgery unit of our institution for a suspected intra-abdominal abscess. Five months earlier he had undergone a duodenocephalopancreatectomy at another hospital because of distal bile adenocarcinoma, and the post-operative course was complicated by biliary leakage from the biliary–enteric anastomosis. Hence, in that

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**Figure 1** CT scan at admission. A large collection (\*) with thickened walls in the right hypochondrium can be seen. The anterior air level (white arrow) supports the diagnosis of an anaerobic abscess. The location of the abscess can be predicted to be under the Glisson capsule of the liver; the angle between the liver and the collection is acute (empty arrow), and no intraperitoneal fluid is present in the abdomen. Small lymph nodes can be observed at the liver hilum (curved arrow).

same hospital a percutaneous trans-hepatic biliary drainage (PTBD) was unsuccessfully attempted, with the occurrence of one hepatic hematoma clearly visible at sonographic examination.

Before admission to our hospital the patient had had a history of fever and persistent abdominal pain. On admission, a computed tomography (CT) scan (Figure 1) showed a round collection (141 × 170 × 208 mm) with thickened walls in the right hypochondrium displacing the liver medially; the collection also had an anterior air level. No intraperitoneal fluid was found on the admission CT. The findings were suggestive of an abscess located under the Glisson capsule of the liver.

After CT, sonography was performed to assess the collection and to guide drainage with a 10 French pigtail catheter. A large volume of purulent material (>2500 ml) was drained on the first day. The patient was started on empirical treatment with imipenem/cilastatin for the primary suspect of an abdominal abscess at the site of the recent surgery before obtaining the results of culture.

The drained purulent material was sent to the microbiology laboratory of our institution and arrived within 30 minutes. At the laboratory, a direct Gram stain with microscopy examination was performed, but results were negative. The purulent material did not smell of anaerobes, nevertheless it was incubated in O<sub>2</sub>, CO<sub>2</sub>, and anaerobically, as per the protocol at our laboratory. It took three days for *E. rhusiopathiae* to grow; this was then identified by means of API Coryne (Biomerieux, Italy). Since no standard method exists for susceptibility testing/interpretation, we tested a series of antibiotics by the Kirby–Bauer method with sensitivity empirically defined as a zone of inhibition >20 mm. As expected the isolated strain was resistant to vancomycin, clindamycin, ceftriaxone and trimethoprim–sulfamethoxazole, while susceptible to penicillin, imipenem, tetracycline, erythromycin, ciprofloxacin, gentamicin and linezolid.



**Figure 2** Follow-up CT after 10 days of antibiotic treatment and ultrasound-guided drainage catheter placement. The collection (\*) still has thickened walls but the size is reduced. Some air bubbles are present (white arrow). The correctly positioned drainage catheter can be observed (empty arrow). Pneumobilia (curved arrow) can be seen close to the left portal vein, a normal finding following duodenocephalopancreatectomy.

The patient's clinical condition steadily improved (reduction in size of the abdominal mass, disappearance of fever) and C-reactive protein dropped from 4.7 mg/dl (normal value 0–0.5 mg/dl) at admission to 0.2 after 12 days of antibiotic treatment. A follow-up CT scan (Figure 2), performed 10 days after admission to assess the evolution of the abscess, demonstrated a reduction in the size of the abscess (97 × 21 × 113 mm) and good placement of the drainage catheter.

In consideration of the high frequency of endocardium involvement in invasive *Erysipelothrix* infections, echocardiography was performed and no sign of endocarditis could be identified.

After 14 days of intravenous antibiotic treatment the patient left the hospital and continued oral treatment with doxycycline and levofloxacin for a further 16 days (giving a total of 4 weeks of antibiotic treatment from admission). The patient had fully recovered at the end of the antibiotic treatment. At a final ultrasound evaluation after discharge from the hospital and at the end of antibiotic treatment, the abscess was no longer visible. The patient's history was re-evaluated but no 'typical' risk factor for *Erysipelothrix* infection was identified, i.e., working, home or leisure activities that could be connected.<sup>3</sup>

## Discussion

We have described a rare invasive *Erysipelothrix* infection and, to our knowledge, this is the first report of an intra-abdominal abscess caused by this microorganism. Although no 'typical' risk factor for *Erysipelothrix* infection was identified, it is known that this pathogen is able to persist for long periods in the environment and survive in marine locations. No involvement of the endocardium, which frequently occurs in invasive *Erysipelothrix* infection, was detected. Empiric

antibiotic treatment with imipenem was very effective in conjunction with ultrasound-guided drainage of the abscess, and an early clinical improvement was observed.<sup>3,10</sup>

This atypical site of *Erysipelothrix* invasive infection could have occurred because of the presence of a 'locus minoris resistentiae'—the hematoma at the site of a recent surgery. This was probably the main factor favoring the occurrence of the abscess caused by this minimally aggressive organism.

Of note, it was possible to grow the agent of the detected abscess. This underlines the importance of performing culture of intra-abdominal (and of otherwise sterile site) abscesses, possibly before starting antibiotic treatment, and the importance of allowing time for growth of slow growing bacteria before declaring results to be negative (at least 7 days).<sup>3</sup>

Although *Erysipelothrix* invasive infections are rarely reported, they may be under-diagnosed (and thus under-reported) because of the resemblance they bear to other infections and the problems that may be encountered in isolation and identification of this pathogen.<sup>11</sup>

In conclusion, we can summarize that unexpected/unusual pathogens should be considered in intra-abdominal infections. However, empiric treatment of complicated intra-abdominal infections with carbapenems can still be recommended given their very good spectrum of activity, which includes activity against *E. rhusiopathiae*.

*E. rhusiopathiae* is an old and rare pathogen and it can cause serious infections, however it is still far from being fully known and characterized. In this regard, it would be useful to increase the number of reports of *Erysipelothrix* infections for a better understanding and characterization of the clinical manifestations caused by this pathogen.

## Conflict of interest

No conflict of interest to declare.

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