Nocardiosis in a Patient with Acute Necrotizing Pancreatitis: Can A Simple Microscope Specimen Save a Patient’s Life? A Case Report

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Abstract

Objective: A 50-year-old immunocompetent patient was hospitalized following an episode of acute necrotizing pancreatitis. Piperacillin/tazobactam was administered empirically. Despite continuous IV antibiotic therapy, on the 20th day of treatment the patient required urgent laparotomy. A swab sample was collected and subsequent Vancomycin with Amikacin administered empirically.

Design: Despite administration of intensive treatment, general clinical condition of the patient deteriorated. The question was, why we experienced ineffectiveness of conservative treatment, as well as of subsequent surgical procedures? Was the microbiological specimen taken incorrectly? Why was it difficult to identify bacteria constituting the etiological infection source?

Results: What is emphasized in our article is the significance of proper collection of a specimen and gathering an appropriate clinical history. What also needs to be taken into account in severe acute pancreatitis is perhaps allowing for longer bacterial culture growth.

Conclusion: In this case, the infection was caused by a past injury with the previously undiagnosed etiological factor, i.e. Nocardia spp., challenging both current diagnosis and treatment, which ultimately resulted in severe necrotizing pancreatitis. This indicates the importance of a microbiologist for diagnosis and treatment.

Keywords: Nocardiosis; Nocardia spp; Acute pancreatitis; Pancreatic abscess; Necrotizing pancreatitis

Case Report

A 50-year-old patient was admitted due to increasing abdominal pain accompanied with nausea and vomiting. Prior to admission the patient developed discomfort in the epigastric region which was accompanied by nausea. In the evening, the patient’s general condition deteriorated as persistent pain appeared together with vomiting with no relief. The pain increased significantly, the patient vomited several times, was weak, and it was more difficult to maintain logical contact with him. On admission blood pressure was 160/90, pulse 115 beats/min., saturation 97%, tachypnea (24 breaths/min.). Laboratory results presented glycaemia 221 mg/dl, CRP 6.5 mg/dl, serum amylase 722 U/l and a slight anemia with Hb 13.3 g/dl.

His medical history revealed cholecystectomy, stable angina pectoris, type 2 diabetes, hypertension. The patient was continued on betaxolol, ramipril, torasamide, rosuvastatin, fenofibrate, trimetazidine, and metformin. He did not report any allergies, had not been smoking for several years, and used nicotine substitutes only periodically. He did not consume alcohol.

The patient was classified as risk group 2 due to diabetes, obesity, and hospitalization within the last 12 months. Other risk factors were dismissed by the patient.

On admission the patient was conscious and oriented to time, place, and person. On examination type 1 obesity was observed with BMI 32.5, blood pressure 160/90, pulse 115 beats/min., body temperature 36.8°C, saturation 97%. The abdomen was soft, distended, tender in the epigastric region, negative peritoneal signs, slow peristalsis, with no pathological resistance. On auscultation, symmetric alveolar murmur was observed, although percussion did not indicate any changes. Other general and neurological tests showed no significant deviations from the norm (Table 1), with the APACHE II score equal to 12 points.

Abdominal X-ray showed no pathological changes. Chest X-ray revealed only high positioning of the left diaphragm dome. During abdominal USG examination hepatic steatosis was confirmed. No free fluids in the abdominal cavity were discovered, and the pancreas was covered by intestinal gasses.

In differential diagnosis the following conditions were considered: acute pancreatitis, cholelithiasis, perforation and digestive tract obstruction, abdominal aorta aneurysm, intestinal ischemia, and myocardial infarction.

Due to the diagnosed acute pancreatitis, the standard conservative treatment was ordered. The patient received multi-electrolyte fluid and 0.9% NaCl 250 ml/hr, analgesics (paracetamol, pethidine, metamizole), proton pump inhibitors and anticoagulation prophylaxis according to Praslin risk assessment model. The patient also underwent a daily urine collection, circulatory system monitoring and fasting. On the 3rd day, CT scan of the abdominal cavity was performed in order to assess the presence of necrosis. As a result, hypoperfusion and a small amount of fluid were discovered. On the 4th day enteral nutrition was attempted via naso-intestinal probe; however, due to the patient’s intolerance it was removed and parenteral nutrition was reintroduced. On the 7th day CT scan was performed again and piperacillin/tazobactam was administered empirically since the patient’s general condition deteriorated. According to APACHE II, score reassessment was 13 (Table 1). Furthermore, control CT scan demonstrated a faint

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Received November 02, 2015; Accepted December 04, 2015; Published December 11, 2015


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pancreas structure, free fluid around it, as well as an infiltration of the peripancreatic adipose tissue. On the 14th day, the patient complained of dyspnea at rest with numerous crepitations over the upper lobes. Increasing diffuse edema in the lower extremities and genitalia was noted. Additionally, the patient’s level of pain increased. Intensive nutrition was ceased. Chest and head CT scan were performed in order to confirm non-specific inflammation proctitis and sigmoid diverticulitis were confirmed. Fiber colonoscopy was performed in order to confirm non-specific peripancreatic adipose tissue. On the 14th day, necrosis of the pancreas was confirmed using CT scan. The patient underwent a 6-month-long treatment with Bisepotol in the following pattern: 4 weeks 2 × 960 mg, then 20 weeks 2 × 480 mg. Additionally, in the outpatient department biopsy was performed in order to confirm non-specific inflammation proctitis and sigmoid diverticulitis were confirmed. The patient underwent rehabilitation with good effects, and parenteral nutrition was ceased. Chest and head CT scan were performed in order to assess the presence of secondary abscesses, which were excluded. On the 60th day the patient was discharged from the hospital in good condition. The patient was monitored in the outpatient clinic for the next 2 months. During imaging examination, further decrease in fluid collection was observed. The patient underwent a 6-month-long treatment with Bisepotol in the following pattern: 4 weeks 2 × 960 mg, then 20 weeks 2 × 480 mg. Additionally, in the outpatient department fiber colonoscopy was performed in order to confirm non-specific inflammation proctitis and sigmoid diverticulitis were confirmed.

### Discussion
20 to 70 cases of acute pancreatitis per 100,000 inhabitants are noted in Poland each year [1]. In 5-10% of cases necrosis appears within the first days and becomes infected in 16-47% patients [2-4]. It constitutes one of the most serious complications with mortality reaching 30% [5,6]. The inflammation is connected with bacteria translocation to the blood and consecutively to the pancreas. It is a multifactor aspect which combines decrease in the peristalsis, damage to the intestinal mucous membrane lining due to ischemia, and immunity decline. Usually, it is possible to grow bacteria constituting intestinal flora. For this reason, were performed with peritoneal toilet and drainage implemented on the 2nd and 5th day after the surgery. Nevertheless, microbiology cultures from three previous surgeries were sterile. On the 13th day control CT scan revealed an abscess 130 × 50 mm on the anterior stomach wall, as well as in the subdiaphragmatic area – 53 × 17 mm. During operation 50ml of pus was collected from a large abscess. In the direct specimen Nocaridia spp. was discovered, although the bacteria was impossible to grow in spite of a 2-week-long culture time. The pathology report of the histopathological samples described only necrotizing tissue. For this reason, the first-line antibiotic recommended in necrocardiosis (trimethoprim/sulfamethoxazole), a gradual improvement of the general condition was observed (Table 1). Trimethoprim/ sulfamethoxazole was administered 960 mg 2×/day i.v. As a result, a steady decrease in CRP and WBC was observed. Additionally, the dosage of analgesics was gradually reduced until they were discontinued. In the control tests a gradually decreasing fluid collection was observed. The patient underwent rehabilitation with good effects, and parenteral nutrition was ceased. Chest and head CT scan were performed in order to assess the presence of secondary abscesses, which were excluded. On the 60th day the patient was discharged from the hospital in good condition. The patient was monitored in the outpatient clinic for the subsequent two months. During imaging examination, further decrease in fluid collection was observed. The patient underwent a 6-month-long treatment with Bisepotol in the following pattern: 4 weeks 2 × 960 mg, then 20 weeks 2 × 480 mg. Additionally, in the outpatient department fiber colonoscopy was performed in order to confirm non-specific inflammation proctitis and sigmoid diverticulitis were confirmed.

### Table 1: Other general and neurological tests showed no significant deviations from the norm.

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC</td>
<td>10.20 × 10^3/µl [3.90 – 11.00]</td>
</tr>
<tr>
<td>RBC</td>
<td>4.39 × 10^6/µl [4.20-5.80]</td>
</tr>
<tr>
<td>Hb</td>
<td>13.3 g/dl [13.5-17.2]</td>
</tr>
<tr>
<td>HCT</td>
<td>38.5% [39.5-50.5]</td>
</tr>
<tr>
<td>PLT</td>
<td>275 × 10^9/µl [130-400]</td>
</tr>
<tr>
<td>Sodium</td>
<td>141 mmol/l [136-145]</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.30 mmol/l [3.50-5.10]</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.98 mg/dl [0.70-1.20]</td>
</tr>
<tr>
<td>CRP</td>
<td>&lt;5.0 mg/l [3.50-5.10]</td>
</tr>
<tr>
<td>GLU</td>
<td>221 mg/dl [70-99 (fasting)]</td>
</tr>
<tr>
<td>Amylase</td>
<td>722 U/l [28-100]</td>
</tr>
<tr>
<td>Troponin</td>
<td>&lt;3 ng/l [99 percentile URL at CV&lt;10%]</td>
</tr>
</tbody>
</table>

### Figure 1: Necrotising pancreatitis with acute necrotic collections.
Nocardiosis constitutes an extremely rare and diagnostically challenging disease and described cases are sporadic [7]. The cooperation between the clinicians and microbiologists is vital because the previously given recommended course of antibiotic which, on one hand, did not present any clinical effect, and, on the other, it weakened the bacterium so that no in vitro culture growth was observed. Initially, while the Nocardia spp. infection had not been yet properly diagnosed, the patient was on piperacillin/tazobactam. There are no cases in literature concerning the efficacy of this drug in nocardiosis treatment. Perhaps the period of administration was not long enough? After its discontinuation in our patient, amikacin and vancomycin were introduced. One piece of literature presented a finding that 100% of bacteria strains are susceptible to amikacin, whereas Nocardia spp. are usually vancomycin resistant [11]. Vancomycin showed no results in our patient and amikacin was ineffective in monotherapy, or was considered to be an appropriate drug for nocardiosis treatment, but cases resistant to sulphonamides may appear [15]. Linezolid is also considered to be an appropriate drug for nocardiosis treatment, but clinical data is very scarce. In fact, a case of lung nocardiosis was described where trimethoprim/sulfamethoxazole therapy failed after 5 months. In our patient after treatment with this antibiotic, the patient’s condition improved. Despite bacterial culture, performed alongside the specimen and lengthening the incubation time up to 2 weeks, it was impossible to grow these bacteria. It may have occurred due to the previously given recommended course of antibiotic which, on one hand, did not present any clinical effect, and, on the other, it weakened the bacterium so that no in vitro culture growth was observed.


