Intra-Abdominal Abscess and Primary Peritonitis Caused by Streptococcus anginosus

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Abstract

Introduction: The Streptococcus anginosus group of bacteria are low-virulence bacteria existing as commensals in the oral flora and gastrointestinal tracts of humans. S. anginosus may spread to the blood in individuals with poor oral hygiene in cases of oral infections, such as gingivitis and tooth abscesses, that develop following the loss of mucosal unity. This may lead to infections in the whole body, primarily as brain and liver abscesses.

Case Presentation: A 32-year-old male patient presented with complaints of nausea, vomiting, and diffuse abdominal pain. Diffuse abdominal tenderness and rebound tenderness were detected particularly in the epigastrium and right upper quadrant. Laboratory assessment revealed a leukocyte count of 20,500/mm3. Free fluid around the liver and heterogeneous areas of abscess formation in the right lateral gallbladder were revealed on abdominal computed tomography. Diffuse adhesions between the bowel and seropurulent free liquid in the abdomen were detected on surgical exploration, and a sample was taken for cultures. The patient was discharged without complications on the sixth postoperative day and his antibiotic course was completed with 4 weeks of oral treatment. We reviewed the literature for similar cases of disseminated pyogenic infections caused by the S. anginosus group.

Conclusions: It should be kept in mind that the oral flora bacterium S. anginosus may cause transient bacteremia and deep-seated organ abscesses in immunodefective patients with poor oral hygiene. Such patients with intra-abdominal abscesses should be treated with antibiotics and surgery.

Keywords: Abscess, Peritonitis, Streptococcus anginosus

1. Introduction

Intra-abdominal abscesses generally develop as a result of abdominal surgery, intra-abdominal pathologies (e.g., diverticulitis, appendicitis, biliary disorders, pancreatitis, and organ perforations), or penetrating abdominal trauma. Abscesses caused by infectious bacteremia reaching the abdomen from a distant focus are very rare (1). This paper describes a case of intra-abdominal abscess and primary peritonitis caused by S. anginosus, which is very rare and was considered to have been caused by oral flora in an immunocompetent patient.

2. Case Presentation

A 32-year-old male patient presented to the emergency department with complaints of nausea, vomiting, and diffuse abdominal pain in all quadrants, especially in the epigastrium. On physical examination, diffuse abdominal tenderness and rebound tenderness were detected, particularly in the epigastrium and right upper quadrant. Laboratory assessment revealed a leukocyte count of 20,500/mm3 with 85% polymorphonuclear leukocytes (PNLs)/neutrophils, hemoglobin of 12.5 g/dL, hematocrit of 37.2%, AST of 26 U/L, and ALT of 29 U/L. Abdominal computed tomography (CT) showed free fluid approximately 1 cm thick around the liver and heterogeneous areas of abscess formation in the right lateral gallbladder, which mea-
The most common causes of intra-abdominal abscesses are gastrointestinal perforations, postoperative complications, penetrating traumas, and genitourinary infections. In one-third of cases, the abscess arises as a sequela of diffuse peritonitis (1). Furthermore, many publications have reported that organ abscesses may also be caused by oral infections, such as gingivitis and dental abscesses, with poor oral hygiene and dental problems. Various reports have shown that bacteremia development with impairment of mucosal integrity due to poor oral hygiene may lead to hepatic abscesses (4, 5). We present a patient with no regular teeth-cleaning regimen and poor oral hygiene, who had not undergone dental check-ups for a long period and had dental caries.

Ultrasongraphy (USG) is a useful non-invasive method that is easily applied for identifying intra-abdominal inflammatory processes (6). With USG, even peritoneal fluid of < 100 mL can be identified. If peritoneal fluid is detected on USG, diagnostic aspiration can be carried out under USG guidance. On Gram staining of the fluid, detection of white blood cells or bacteria generally indicates emergency laparotomy. Culdocentesis can be carried out in cases of pelvic peritonitis. A large number of white blood cells may be detected during abdominal aspiration, and an offensive odor may occur due to an exudative polymicrobial anaerobic infection (6). Since the patient presented to our hospital’s emergency department with an acute abdomen history, including diffuse peritonitis (1). Furthermore, many publications have reported that organ abscesses may also be caused by oral infections, such as gingivitis and dental abscesses, with poor oral hygiene and dental problems. Various reports have shown that bacteremia development with impairment of mucosal integrity due to poor oral hygiene may lead to hepatic abscesses (4, 5). We present a patient with no regular teeth-cleaning regimen and poor oral hygiene, who had not undergone dental check-ups for a long period and had dental caries.

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tions encompasses surgical exploration, termination of the infectious period, and supportive care to enhance the patient’s response to sepsis treatment. The underlying pathology should be removed surgically, and drainage of the infection is necessary (7). In our case, the abdominal fluids were aspirated and the abscess was drained. Meanwhile, intravenous ceftriaxone and metronidazole were administered (Table 1).

*S. anginosus* bacteria are commensal in the oropharyngeal isthmus, urogenital canal, and gastrointestinal tract (2). In cases of poor oral hygiene or alcoholism, its concentration in the saliva increases (15). In most publications, the clinical significance of bacteremia related to *S. anginosus* is noted (16), and it has also been reported that it can lead to serious pyogenic infections that cause abscess formation later on (16, 17). An infection may occur in the central nervous system, head and neck, abdominal cavity, or chest cavity (16, 17). While peritonitis and abscess formation due to *S. anginosus* is uncommon, such cases have not been defined in the literature. The poor oral hygiene of our reported patient suggests a hematogenous pathogenesis caused by a gastrointestinal focus.

In conclusion, except in immunodeficient patients or in pathologies of the bile duct and gastrointestinal system, the incidence of intra-abdominal abscesses caused by *S. anginosus* is relatively low. It should be kept in mind that this oral flora bacterium may cause transient bacteremia and deep-seated organ abscesses in immunodeficient patients with poor oral hygiene. Such patients with intra-abdominal abscesses should be treated with antibiotics and surgery.

**Footnotes**

**Authors’ Contribution:** The authors alone are responsible for the content and writing of this article. Huseyin Agah Terzi, Tayfur Demiray, Guner Cakmak, Mehmet Koroglu, and Ihsan Hakki Ciftci worked on the study design, and wrote and drafted the manuscript. Huseyin Agah Terzi, Tayfur Demiray, Mehmet Koroglu, Guner Cakmak, Ihsan Hakki Ciftci, Ahmet Ozbek, Mustafa Altindis collected the data.

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### Table 1. Case Reports of Disseminated Pyogenic Infections Due to S. anginosus

| Reference             | Patient Age/Sex | Underlying Conditions                      | Blood Culture | Organ Dissemination | Antimicrobial Therapy                  | Outcome and Follow-Up |
|-----------------------|-----------------|--------------------------------------------|---------------|---------------------|----------------------------------------|------------------------|
| Medrzy 1999 (4)       | 60/Male         | COPD, tooth cavities                       | +             | +                   | IV amoxicillin followed by 1 month oral | Healed, right-hand paresis (5 months) |
| Lee et al. 2001 (5)   | 50/Male         | Total left hip arthroplasty                | +             | +                   | Peri-prosthetic abscess                | Decayed               |
| Lombardi et al. 2008  | 55/Male         | Chronic alcoholism, moderate BPCO, thecal abscess | -             | +                   | Pneumonia                               | Healed                |
| Kitagawa et al. 2009  | 64/Female       | Neurofibromatosis type I, gastric-intestinal stomal tumor (GIST) | +             |                     | Tumor abscess                          | Healed                |
| Mckenzie et al. 2008  | 41/Male         | Allergy                                   | +             | +                   | IV meropenem, vancomycin, metronidazole | Healed                |
| Mutneja et al. 2006   | 57/Male         | Osteoarthritis, urethral stricture, evasion | -             | +                   | Lung abscess                           | Healed                |
| Walley et al. 2014    | 47/Male         | Alcoholism                                | +             | +                   | Abscess in leg muscles                 | Healed                |
| Present study         | 52/Male         | Tooth decay                               | +             | +                   | Abscess near liver                     | Healed                |

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