

Multiple abscesses in the thorax and abdomen due to *Streptococcus anginosus*: A case report and literature review

Abscesos múltiples en tórax y abdomen por Streptococcus anginosus: reporte de caso y revisión de literatura

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Keywords:

thoracic abscess,
abdominal abscess,
Streptococcus anginosus, infection,
a case report.

Palabras clave:

absceso torácico,
absceso abdominal,
Streptococcus anginosus, infección,
reporte de caso.

ABSTRACT

Introduction: intra-abdominal abscesses occur mainly secondary to a surgical intervention that, for some reason, becomes contaminated, whether because of appendicitis, perforations, or trauma. **Case report:** we present a case report of abscesses associated with *Streptococcus anginosus* in an adult male patient who underwent fundoplication by laparoscopy. **Results:** six days after laparoscopic surgery, the patient presented data of infection of abdominal origin with systemic involvement, and the presence of abscesses in the abdomen and thorax were identified and satisfactorily treated. **Conclusions:** new agents capable of dissemination by different routes have been identified; *Streptococcus anginosus* is becoming increasingly relevant when establishing a diagnosis and line of treatment.

RESUMEN

Introducción: los abscesos intraabdominales se presentan principalmente de manera secundaria a una intervención quirúrgica que por alguna razón se contamina, puede ser como resultado de una apendicitis, perforaciones o trauma. **Reporte de caso:** se presenta un reporte de caso de abscesos asociados a *Streptococcus anginosus* en paciente masculino adulto que fue sometido a funduplicatura por laparoscopia. **Resultados:** seis días posteriores a intervención quirúrgica laparoscópica se presenta paciente con datos de infección de origen abdominal con compromiso sistémico, identificándose y tratándose de manera satisfactoria la presencia de abscesos en abdomen y tórax. **Conclusión:** se han identificado nuevos agentes capaces de diseminación por diferentes vías, el *Streptococcus anginosus* se vuelve cada vez más relevante al establecer un diagnóstico y línea de tratamiento.

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Received: 07/27/2021
Accepted: 12/23/2022



INTRODUCTION

Intraabdominal abscesses are mainly generated from contaminated or dirty surgeries such as diverticulitis, appendicitis, intestinal perforations, and penetrating abdominal trauma, among others.¹ Other causes of abdominal abscesses are those caused by bacterial translocation from contiguous foci,

or hematogenous or lymphatic dissemination from a distant focus.²

The *Streptococcus anginosus* group (SAG) has three species (*S. intermedius*, *S. constellatus*, and *S. anginosus*). These microorganisms have low bacterial virulence and are generally found as oral and genitourinary bacterial flora.³ However, multiple reports in the literature demonstrate these organisms' ability

How to cite: Valdés-Castañeda A, Cervantes-Gutiérrez Ó, Jafif-Cojab M, de la Cajiga-León A, Arribas-Martin JP, Guadarrama-Sistos VS, et al. Multiple abscesses in the thorax and abdomen due to *Streptococcus anginosus*: A case report and literature review. *Cir Gen.* 2022; 44 (2): 73-76. <https://dx.doi.org/10.35366/109715>

to form distant abscesses by hematogenous dissemination.¹

In this work, we report through the presentation of a clinical case in a private hospital in the State of Mexico, Mexico, in which a patient who had undergone laparoscopic fundoplication showed abscesses in the thorax and abdomen, where *S. anginosus* was identified. It also emphasizes the importance of detecting this pathogen, which has increased its incidence in recent years.

CLINICAL CASE

We present the case of a 51-year-old male patient diagnosed with gastroesophageal reflux disease, whose only comorbidity was obesity, scheduled for fundoplication by laparoscopy. Preclinical examinations within normal parameters revealed complex airway data reported by anesthesiology. A prophylactic antibiotic was administered consistent of ceftriaxone 1 g in a single dose. The surgery was successfully performed, and only three attempts for intubation were required without incident. On the first postoperative day, an esophagogram with a water-soluble contrast medium was performed, which showed the integrity of the digestive tract without leakage of the contrast medium into the abdominal cavity.

On the second postoperative day, the patient was discharged. Two days later, while receiving analgesic therapy with nonsteroidal anti-inflammatory drugs, he presented to the emergency department with a temperature of 39.5 °C and tachycardia of 115 beats per minute. Physical examination revealed a soft, depressible, non-painful abdomen, with no evidence of peritoneal irritation. The rest of the examination was normal. A thoracoabdominal computed tomography (CT) scan showed a basal consolidation in the left lung field and the expectoration culture reported *Streptococcus anginosus*. Treatment with broad-spectrum antibiotics, such as ceftriaxone, and metronidazole was initiated. On the third day, he started with anorexia, and it was decided to take a new CT scan identifying a 300 ml subhepatic abscess. It

was decided to drain the abscess and wash the abdominal cavity by laparoscopy without incident. Five days later, he presented fever of 38.5 °C, so it was decided to perform a new imaging study identifying multiple abscesses in the thorax and abdomen, which were drained by CT-guided puncture without incident.

With favorable evolution, the patient was discharged five days later with improved symptoms, without fever or alarm data. Antibiotic treatment with imipenem and linezolid was continued, and the patient evolved satisfactorily.

DISCUSSION

Streptococcus anginosus (SAG), first described by Andrewes and Horder in 1906 as a variant of *Streptococcus pyogenes*, constitutes the *S. anginosus* family along with *Streptococcus intermedius* and *Streptococcus constellatus*, also known as the *Streptococcus milleri* group.⁴ Infections by these bacteria have reported significant variability in their clinical presentations.⁵ These organisms are microaerophilic, catalase-negative, gram-positive cocci that form tiny colonies and a characteristic caramel odor due to the production of the metabolite diacetyl when cultured on blood agar.⁴

These microorganisms are low-virulence bacteria that exist as commensals in the oronasal flora, gingival sulci, gastrointestinal tract, and urogenital tract of humans.⁶ *S. anginosus* can spread to the blood in individuals with poor oral hygiene in cases of oral infections such as gingivitis and dental abscesses that may develop after the loss of the mucosal unit. This can lead to infections manifesting mainly as brain and liver abscesses or peritonitis.¹

Intra-abdominal abscesses usually develop due to abdominal surgery for pathologies such as diverticulitis and appendicitis or for biliary disorders, pancreatitis, or organ perforations. Penetrating abdominal trauma can also cause *S. anginosus* abscesses. Abscesses caused by infectious bacteremia reaching the abdomen from a distant source are rare.¹

Several authors have reported cases of *S. anginosus* infection. J. Tomas describes the association of *S. anginosus* as the causative germ of a pancreatic abscess in a patient with poor oral hygiene after multiple dental extractions.² J. Cooper describes a case of purulent pericarditis due to *S. anginosus* with contiguous subdiaphragmatic and hepatic collections, which resolved with initial subxiphoid pericardial drainage.⁴ G. Simone et al. report a single case of disseminated infection of the *S. anginosus* group with multiple pyogenic cerebral, hepatic, and pulmonary lesions.⁷

A retrospective systematic review of 52 episodes of infection in patients aged 0-18 years by M. Furuichi et al. describes the sites of infection associated with each SAG species among pediatric patients: skin and soft tissue (35%), gastrointestinal tract (21%), genitourinary tract (21%), head and neck (19%), and central nervous system (2%).⁸ *S. anginosus* is most frequently isolated from the genitourinary tract and in blood cultures.⁹ *S. constellatus* is responsible for most skin and soft tissue infections and abscesses, and *S. intermedius* is isolated mainly in head and neck infections and brain abscesses.^{8,9} Polymicrobial infections are the most common, and more than 70% of patients infected with *S. anginosus* and *S. constellatus* are co-infected with obligate anaerobes (*Bacteroides* spp).⁹

Susceptibility of *S. anginosus* to penicillin, ampicillin, cefotaxime, erythromycin, clindamycin, levofloxacin, and vancomycin has been reported.⁹ O. Kobo et al. analyzed the association between SAG species and the presence of pyogenic infection through a retrospective, observational cohort study between the years 2009 and 2015, concluding that *S. intermedius* has the most potential to cause infections involving abscess formation or other deep infections. *S. constellatus* and *S. anginosus* caused bacteremia without an associated pyogenic infection more frequently than *S. intermedius*.³

The acidic environment is one of the most common stressors for bacteria in infected tissues, so they have mechanisms to thrive even in these environments.¹⁰

S. anginosus has aciduric properties like those of *S. mutans* or *S. pyogenes*, so the acid tolerance of this microorganism can facilitate the infection of the oral cavity or gastrointestinal organs, causing chronic inflammation and consequently causing infective endocarditis and abscesses in various sites of the body including the thorax and abdomen as observed in the case.¹⁰

CONCLUSIONS

Species of the SAG group have been identified more frequently and recognized as emerging pathogens in the formation of disseminated infections by the hematogenous route.

However, although these species have been shown to exhibit various factors that promote their virulence, they have yet to acquire much interest from the medical and scientific community.

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Ethical considerations and responsibility: the authors declare that they followed the protocols of their work center on the publication of patient

data, safeguarding their right to privacy through the confidentiality of their data.

Funding: no financial support was received for this work.

Disclosure: the authors declare no conflict of interest in carrying out the work.

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