

**Streptococcus gordonii Bacteremia in an Infant Following Gastric Surgery**İnfanтта Gastrik Cerrahi Sonrası Gelişen *Streptococcus gordonii* BakteremisiZeynep Gökçe Gayretli Aydın<sup>1</sup>, Gönül Tanır<sup>1</sup>, İsmet Faruk Özgüner<sup>2</sup> Gülsüm İclal Bayhan<sup>1</sup>, Türkan Aydın Teke<sup>1</sup>  
Fatma Nur Öz<sup>1</sup>, Özge Metin<sup>1</sup><sup>1</sup>Dr. Sami Ulus Maternity and Children's Research and Education Hospital, Department of Pediatrics, Division of Infectious Diseases, Altındağ, Ankara, Turkey<sup>2</sup>Dr. Sami Ulus Maternity and Children's Research and Education Hospital, Department of Pediatric Surgery, Altındağ, Ankara, Turkey**ABSTRACT**

*Streptococcus gordonii* is a viridans group streptococci of the *S. sanguis* group that is normally a non-pathogenic inhabitant of the oral cavity and occasionally the gastrointestinal tract. *S. gordonii* is well-known for its ability to colonize damaged heart valves and cause bacterial endocarditis, but it rarely causes positive blood cultures in patients that undergo diagnostic procedures involving the gastrointestinal tract, such as sigmoidoscopy and gastroduodenoscopy. Herein we report a 5-month-old patient with bacteremia due to *S. gordonii* following a surgery for malrotation. The source of *S. gordonii* infection was thought to be the malrotation surgery. To the best of our knowledge, the literature does not include any pediatric cases of *S. gordonii* bacteremia following a gastric surgery.

**Key Words:** Streptococcus gordonii, bacteremia, gastric surgery**Received:** 11.28.2014**Accepted:** 07.08.2014**ÖZET**

*Streptococcus gordonii* viridans grup streptokokların *S. sanguis* grubundan olup ağız boşluğunun ve nadiren gastrointestinal kanalın normal flora üyesidir. *S. gordonii* hasarlı kalp kapağında kolonize olarak bakteriyel endokardite neden olur fakat sigmoidoskopi ve gastroduodenoskopi gibi gastrointestinal kanal girişimlerini takiben kan kültüründe nadiren ürer. Bu yazıda malrotasyon cerrahisini takiben *S. gordonii* bakteremisi gelişen 5 aylık hasta sunuldu. *S. gordonii* enfeksiyonunun kaynağı olarak malrotasyon cerrahisi düşünüldü. Bildiğimiz kadarıyla literatürde gastrik cerrahi sonrası *S. gordonii* bakteremisi gelişen çocuk vaka bulunmamaktadır.

**Anahtar Sözcükler:** Streptococcus gordonii, bakteremi, gastrik cerrahi**Geliş Tarihi:** 28.11.2014**Kabul Tarihi:** 08.07.2014**INTRODUCTION**

*Streptococcus gordonii* is a viridans group streptococci of the *S. sanguis* group that is normally a non-pathogenic inhabitant of the oral cavity and occasionally the gastrointestinal tract (1). *S. gordonii* is a causative agent of dental caries and bacterial endocarditis (2), but it rarely causes positive blood cultures in patients that undergo diagnostic procedures involving the gastrointestinal tract, such as sigmoidoscopy and gastroduodenoscopy (3-4). The literature contains no reports of *S. gordonii* bacteremia following gastric surgery. Herein we report a 5-month-old patient with bacteremia due to *S. gordonii* following a surgery for malrotation; the source of *S. gordonii* infection was thought to be the malrotation surgery.

**CASE REPORT**

The male patient had a normal antenatal history, and was born at term (3.1 kg) via normal vaginal delivery. He cried well post delivery and passed meconium on the first day of life. When he was 15 days old, frequent vomiting, bilious vomiting, and abdominal distention developed. He didn't pass any stool for several days and malrotation was diagnosed at another hospital. An emergency laparotomy and Ladd procedure were performed. Post surgery necrotizing enterocolitis (NEC) developed and the patient again underwent surgery to resect the necrotic areas of the gut and for colostomy. He was then referred to our hospital due to short bowel syndrome, cholestasis, and malnutrition at the age of two months.

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Physical examination at presentation in our hospital showed jaundice and the presence of a colostomy bag; the remainder of the examination findings were normal. Laboratory findings were as follows; hemoglobin 12.3 mg/dL (normal range: 9.6-13.5 mg/dL); white blood cell (WBC) count 17,300/mm<sup>3</sup> (normal range: 5000-11,800/mm<sup>3</sup>); platelet count 254,000/mm<sup>3</sup> (normal range: 159,000-353,000/mm<sup>3</sup>); total bilirubin 10.9 mg/dL (normal range: 0-2 mg/dL); direct bilirubin 6.4 mg/dL (normal range: 0-0.2 mg/dL); aspartate aminotransferase (AST) 201 U/L (normal range: 0-47 U/L); alanine aminotransferase (ALT) 281 U/L (normal range: 0-39 U/L); gamma- glutamyl transferase (GGT) 863 U/L (normal range: 0-23 U/L); C-reactive protein (CRP) 38.1 mg/dL (normal range: 0-8 mg/dL); erythrocyte sedimentation rate 80 mm/h (normal range: 0-10 mm/h). The cause of neonatal cholestasis was investigated. IgG for hepatitis A, hepatitis B, anti-toxoplasma, and anti-rubella were positive; IgM for hepatitis A, hepatitis B, anti-toxoplasma, and anti-rubella were negative. Cytomegalovirus (CMV) IgM and IgG were negative. Thyroid function test results were normal. Test results for metabolic diseases, including galactosemia, tyrosinemia, and phenylketonuria were negative. Stool pH was 6.5, stool steatocrit was 0.5% (normal range: 0%-1.5%), and reductant substances were not present in the patient's stool. Ampicillin and amikacin were initiated empirically and ursodeoxycholic acid, vitamin A, vitamin E, vitamin K, and ranitidine were initiated for cholestasis treatment. Total parenteral nutrition (TPN) was given. After two months of hospitalization, the patient underwent surgery for ileostomy closure at the age of four months. Perioperative findings showed that an atretic segment of the colon and most of the small intestine had healed with the formation of fibrous bands. The atretic, strictured, and fibrosed elements of the bowel were resected, and primary anastomosis with two perforation areas was performed. The incision scar healed with granulation tissue. Fever and diarrhea occurred on the post-surgery day 24. Stool microscopic investigation, bacterial culture, rotavirus antigen, and *Clostridium difficile* toxin A and B were negative. Blood culture yielded viridians streptococcus species then identified as *S. gordonii* by VITEK 2 system. For the reason of having no other clinical findings of septicemia, the patient was diagnosed as nosocomial bacteremia. The organism was sensitive to penicillin, ampicillin, clindamycin, ceftriaxone, and teicoplanin with the MIC results of 0.12 microgram/ml to penicillin and 0.5 microgram/ml to ceftriaxone. Ampicillin and clindamycin treatment was initiated based on the antibiotic sensitivity of the yielded organism and for extending anti-anaerobic spectrum. Transthoracic echocardiographic investigation was normal. The patient responded well to the treatment and his fever problem was resolved. Following two blood cultures resulted as negative and antibiotic treatment was continued for 10 days. Clinical follow-up 60 days post surgery showed hemodynamic instability, respiratory distress, and lethargy. General physical examination findings were as follows: fever (38.9°C), prolonged capillary refill time, abdominal distension, and tachypnea. Laboratory findings were as follows: hemoglobin 6.55 mg/dL; WBC count 10,400/mm<sup>3</sup>; platelet count 52,000/mm<sup>3</sup>; CRP 251 mg/dL; prothrombin time (PT) 26.1 s (normal range: 10.8-13.9 s); international normalized ratio (INR) 2.41 (normal range: 0.67-1.17). Meropenem treatment was started due to nosocomial septic shock and disseminated intravascular coagulation. Fresh frozen plasma, red blood cell, and platelet transfusion were administered for supportive therapy. His blood culture yielded *Klebsiella pneumoniae*, which was sensitive to gentamicin, amikacin, and meropenem. Three days later the patient developed cardiopulmonary arrest. Cardiopulmonary resuscitation was initiated, as the patient developed pulseless electrical activity, and then he was intubated and ventilated, but despite aggressive cardiopulmonary resuscitation and intervention, the patient died the same day.

## DISCUSSION

Viridans streptococci are gram-positive bacteria and include the *S. anginosus*, *S. mitis*, *S. salivarius*, *S. sanguinis*, and *S. mutans* groups. The *S. sanguinis* group includes *S. gordonii*, *S. parasanguinis*, and *S. sanguinis* (5). These organisms are among the early colonizers of the oral cavity, and remain abundant as members of the biofilms that colonize the hard and soft tissues of the mouth throughout life; as such, the most common human diseases associated with viridans group streptococci and oral cavity infections are dental caries and periodontal disease (6). Although viridans group streptococci are usually regarded as low-virulence alpha-hemolytic streptococci that commonly colonize the human oropharynx, gastrointestinal tract, and female genitalia, infection can result in bacteremia and may disseminate to distant sites, both in immunocompromised and immunocompetent patients (7). These bacteria were reported as causative agents of native valve infective endocarditis, septic arthritis, peritonitis especially in elderly adult cases with underlying chronic conditions (8, 9, 10).

*Streptococcus sanguis* bacteremia and endocarditis were reported in association with colonic malignancy adenomas, fiberoptic sigmoidoscopy and gastroduodenoscopy in adult cases. It was suggested that *S. sanguis* might enter blood via ulcerated bowel lesions (3, 4, 11, 12).

In contrast to these reports indicating that there is a relationship between ulcerated gastrointestinal lesions bacteremia in adults associated with viridians streptococci including *S. gordonii*, to the best of our knowledge the literature does not include any pediatric cases of *S. gordonii* bacteremia following gastric surgery. The presented patient had malrotation and volvulus and required urgent surgery at another center. He had early complications of surgery, including NEC, short bowel syndrome, cholestasis, and malnutrition. It was reported that these complications occur in as many as 46% of patients that undergo the Ladd procedure. Multiple hospitalizations and surgeries, as in the presented case, have been reported (13). It was thought that *S. gordonii* bacteremia might have been associated with the requirement for multiple gastric surgeries in the presented patient. Viridans group streptococci might be resistance to penicillins and other beta-lactams in contrast to beta- hemolytic strains. The results of SENTRY Antimicrobial Surveillance Program demonstrated a 100.0% susceptibility to linezolid, teicoplanin, vancomycin, 99.1% to quinupristin/dalfopristin, 92.8% to ceftriaxone, 90.3% to clindamycin, 68.6% to penicillin and 64.5% to erythromycin in viridans streptococci isolates (14).

## CONCLUSION

The presented patient's episode of penicillin sensitive *S. gordonii* bacteremia was successfully treated with an appropriate antibiotic regimen, but a complicated and prolonged clinical course resulted in death. We thought that *S. gordonii* bacteremia may have occurred in children as a result of gastric surgery.

## Conflict of Interest

No conflict of interest was declared by the authors.

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