

Case Report of *Streptococcus constellatus* Bacteremia in an 11-Month-old Child-clinical and Microbiological Aspects

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ABSTRACT

Streptococcus constellatus (*S.constellatus*), normal commensal bacteria of the human oral cavity is known to be associated with abscess formation and/or bacteremias. This is an infrequently isolated organism from the blood culture of the patients and is considered pathogenic when isolated. Because of the increased usage and wide availability of newer automated methods and other technological advances, better isolation and identification of these organisms has been possible. We report a case of *S.constellatus* bacteremia associated with abscess in an 11-month-old child.

Keywords: Antibiotics, Blood culture, Lymphadenitis

CASE REPORT

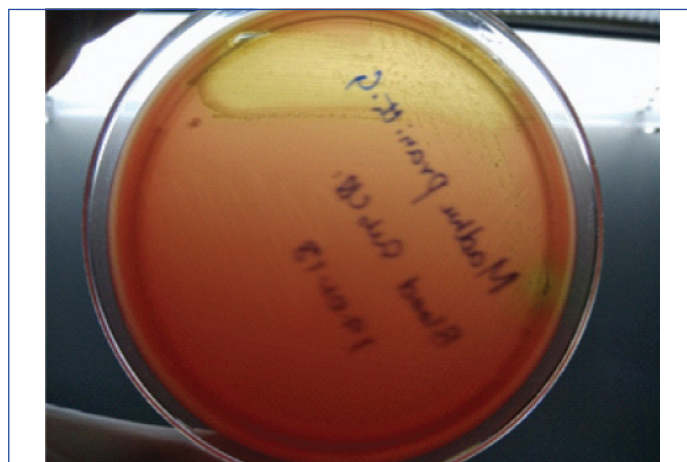
An 11-month-old male child was admitted to the hospital with complaints of high grade fever, cold and cough of three days duration. At the time of presentation child was sick, febrile and has swelling over the left side of the upper part of the neck which was warm and firm to palpate.

On auscultation wheeze was noticed on the left side of the chest along with subcostal and intercostal retractions. Nasal flaring was observed. Child had disproportionate tachycardia of 204/min and the blood pressure was 94/76 mmHg. Spo₂ was 96% at room air. Respiratory rate was 52. On palpation hepatomegaly was noted with liver enlargement of 3 cm from the coastal margin. On examination child was in compensated shock with respiratory distress and tender hepatomegaly. Child was treated with intravenous fluid boluses and first dose of antibiotics Vancomycin and Meropenem (after sending blood cultures).

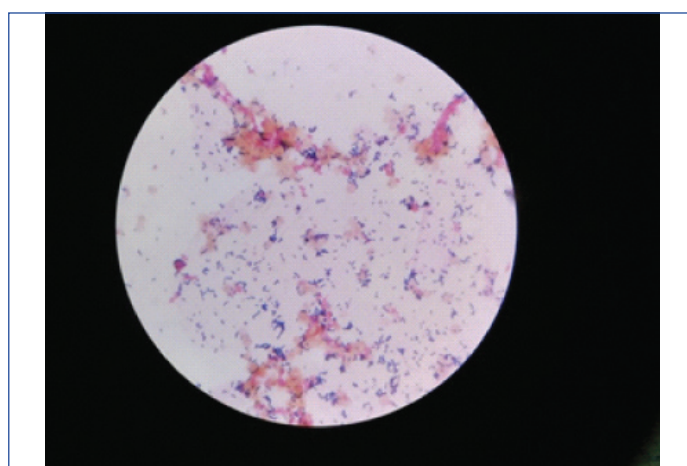
Investigations revealed neutrophilic leukocytosis (TLC-22,000 with 80% neutrophils), increased CRP (145 mg/L). Ultra sound neck revealed multiple lymph nodes with necrosis. Arterial blood gas analysis was suggestive of uncompensated metabolic acidosis. Child was mechanically ventilated in view of fluid refractory catecholamine resistant shock. In spite of all the above resuscitative measures child could not be saved.

Microbiological aspects: *S.constellatus* was isolated from both the sets of blood cultures three days after the blood collection [Table/Fig-1,2]. Blood culture was done in BacTAlert automated blood culture system and identification by vitek 2 (bioMerieux). Species confirmation was done by MALDI TOF (Matrix-assisted laser desorption ionization-time of flight mass spectrometry) (Bruker). The antibiotic sensitivity was detected by vitek 2 and the organism was sensitive to all the antibiotics including ampicillin, chloramphenicol, ceftriaxone, cefotaxime, erythromycin, levofloxacin, tetracycline, minocycline, linezolid and vancomycin. The organism has been a slow growing pathogen and by the time the organism was isolated, child had expired. *S.constellatus* is not a common organism routinely isolated from clinical specimens and when isolated from blood cultures it is considered as potential pathogen. In the present case study the organism has been isolated from both the blood culture sets. The death of the child occurred due to the septic shock. The source of infection in the present case can be probably attributed to the neck abscess (pus from the abscess was not sent for culture as the child was started on high end antibiotics immediately after

sending the blood for culture as the child was in septicaemia) which might have disseminated from the local site and lead to the shock and ultimately death of the child.



[Table/Fig-1]: Blood agar plate showing pin-point haemolytic colonies of *Streptococcus constellatus*.



[Table/Fig-2]: Direct gram stain from the blood culture broth showing gram positive cocci in chains.

DISCUSSION

S.constellatus, a member of the *Streptococcus milleri* group, is a part of the normal flora of the human oral cavity. It is generally considered as commensal organism and is usually not pathogenic [1]. It is a facultative anaerobe and has characteristic ability to cause

abscesses. They are capable of disseminating from the local site where they are commensals and can cause various infections in the body. The importance of these particular bacteria exalts when it is found in the blood and it is considered as true pathogen when isolated from blood cultures. They have been associated with septic thrombophlebitis of jugular vein, endocarditis, peritonsillar or sinus abscesses, infections of mouth and throat, and metastatic abscesses to various organs like liver, lung, brain, kidney etc., [2-4]. Bacteremias caused by *S.constellatus* have been reported by various researches in different contexts [2-7]. Majority of the cases were in association with dental procedures or odontogenic infections or deep abscess. In the present study the bacteremia was probably associated with the neck abscess and lymphadenitis. Whiley RA et al., has isolated *S.constellatus* from various clinical specimens including head and neck infections, blood, respiratory and CNS infections [2]. Fujiyoshi T et al., explained about the clinical and bacteriological significance of the *Streptococcus milleri* group in deep neck abscesses in his research [5]. Abe M et al., reported odontogenic *S.constellatus* infection leading to systemic infection [6]. Similarly, Ping KW et al., reported *S.constellatus* bacteremia causing septic shock following tooth extraction [7]. In the Indian context only very few studies have mentioned about *S.constellatus* [8-11]. This might be probably due to the lack of clinical suspicion and difficulty in isolation and identification of the organisms by conventional methods and limited resources. With the advances in the newer technologies, automated systems and molecular methods, more number of such organism can be isolated and identified in the future.

CONCLUSION

The present case report describes about the bacteremia caused by *Streptococcus constellatus*. High degree of clinical suspicion is essential when such type of case presentation occurs, which if overseen may lead to fatal outcomes.

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REFERENCES

- [1] Ruoff KL. *Streptococcus anginosus* ("*Streptococcus milleri*") : the unrecognized pathogen. Clin Microbiol Rev. 1988;1:102-08.
- [2] Whiley RA, Beighton D, Winstanley TG, Fraser HY, Hardie JM. *Streptococcus intermedius*, *Streptococcus constellatus*, and *Streptococcus anginosus* (the *Streptococcus milleri* group): association with different body sites and clinical infections. J Clin Microbiol. 1992;30:243-44.
- [3] Bantar C, Fernandez Caniga L, Relloso S, Lanza A, Bianchini H, Smayevsky J. Species belonging to the "*Streptococcus milleri*" group: anti-microbial susceptibility and comparative prevalence in significant clinical specimens. J Clin Microbiol. 1996;34:2020-22.
- [4] Clarridge JE, Attorri S, Musher DM, Hebert J, Dunbar S. *Streptococcus intermedius*, *Streptococcus constellatus*, and *Streptococcus anginosus* ("*Streptococcus milleri* group") are of different clinical importance and are not equally associated with abscess. Clin Infect Dis. 2001;32:1511-15.
- [5] Fujiyoshi T, Okasaka T, Yoshida M, Makishima K. Clinical and bacteriological significance of the *Streptococcus milleri* group in deep neck abscesses. Nihon Jibiinkoka Gakkai Kaiho. 2001;104(2):147-56.
- [6] Abe M, Mori Y, Inaki R, Ohata Y, Abe T, Saijo H, et al. A case of odontogenic infection by *Streptococcus constellatus* leading to systemic infection in a Cogan's Syndrome patient. Case Reports in Dentistry. 2014;2014:793174.
- [7] Ping Ng KW, Mukhopadhyay A. *Streptococcus constellatus* bacteremia causing septic shock following tooth extraction: A case report. Cases J. 2009;2:6493.
- [8] Haidar A, Haddad A, Naqvi A, Onyesoh NU, Malik R, Williams M. *Streptococcus constellatus* causing septic thrombophlebitis of the right ovarian vein with extension into the inferior vena cava. Case Reports in Infectious Diseases. 2015;2015:495898.
- [9] Padhi S, Mahapatra A, Pattnaik D, Chayani N, Mishra S, Mahapatra A. Bacterial meningitis due to *Streptococcus milleri*. Indian J Med Microbiol. 2004;22:130.
- [10] Behera B, Mathur P, Bhardwaj N, Jain N, Misra MC, Kapil A, et al. Antibiotic susceptibilities, streptococcal pyrogenic exotoxin gene profiles among clinical isolates of group C or G *Streptococcus dysgalactiae* subsp. *equisimilis* & of group GS. *anginosus* group at a tertiary care centre. Indian J Med Res. 2014;139:438-45.
- [11] Datta P, Mohi GK, Chander J, Attri AK. *Streptococcus constellatus* causing multiple liver abscesses: An elusive pathogen. Tropical Doctor. 2018;2:154-56.

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