

Septic Arthritis Due to *Streptococcus sanguis*

RANDALL S. EDSON, MD; DOUGLAS R. OSMON, MD, MPH; AND DANIEL J. BERRY, MD

We report an unusual case of septic arthritis due to *Streptococcus sanguis*, a member of the viridans group of streptococci that are part of the normal flora of the mouth and upper respiratory tract. Our patient had severe underlying periodontal disease, which likely contributed to his

joint sepsis through hematogenous spread. Although viridans streptococci are rare causes of septic arthritis in native joints, they should be considered in the setting of severe periodontal disease.

Mayo Clin Proc. 2002;77:709-710

Septic arthritis remains a true medical emergency despite advances in antimicrobial and surgical therapy. Various microorganisms can be responsible for “non-gonococcal arthritis” that affects native joints, including *Staphylococcus aureus*, *Streptococcus* species, and gram-negative bacilli. After *S aureus*, β -hemolytic streptococci¹⁻⁵ are the most common cause of bacterial arthritis; in contrast, viridans streptococci are rarely associated with bone and joint infection. We report a case of septic arthritis caused by *Streptococcus sanguis* (a member of the viridans streptococcal group) in a man with osteoarthritis and severe periodontal disease.

REPORT OF A CASE

A 66-year-old man was admitted to the hospital on July 27, 1997, because of increasing swelling and erythema of the right knee and leg. He had a history of degenerative joint disease with pain in the right knee of several years' duration. Seventeen days before admission, the patient experienced swelling of the right knee, and 4 days later an arthrocentesis was performed, which showed $24 \times 10^9/L$ white blood cells (predominantly polymorphonuclear). Direct examination for crystals was negative. The Gram stain and bacterial cultures were also negative. Five days before admission, more swelling of the right calf developed in addition to increasing erythema, pain, and swelling of the right leg and knee. The patient was treated for severe periodontal disease between March 1997 and May 1997. He had pronounced subgingival calculus and periodontal pockets, for which he was treated with root planing and débridement. The last periodontal treatment was on May 27, 1997.

From the Division of Infectious Diseases and Internal Medicine (R.S.E., D.R.O.) and Department of Orthopedic Surgery (D.J.B.), Mayo Clinic, Rochester, Minn.

Address reprint requests and correspondence to Randall S. Edson, MD, Division of Infectious Diseases, Mayo Clinic, 200 First St SW, Rochester, MN 55905.

On physical examination, the patient's temperature was 38°C, blood pressure was 182/92 mm Hg, and pulse was 90 beats/min. Findings on examination were normal except for the right lower extremity, which was diffusely erythematous and warm, especially over the knee; a moderate right knee effusion was found. Admission laboratory studies showed a normal white blood cell count and a hemoglobin level of 13.4 g/dL. The erythrocyte sedimentation rate was elevated at 95 mm/1 h. Results of serial arthrocentesis are shown in Table 1. Cultures of synovial fluid obtained from arthrocentesis on July 27, 29, and 31 were all positive for *S sanguis*. Blood cultures, withdrawn before administration of antimicrobial therapy, were negative. Treatment with intravenous cefazolin, 1 g every 8 hours, was begun on July 27, 1997, but because of persistent knee pain and swelling an open arthrotomy with débridement and synovectomy was done on July 31, at which time purulent material was encountered; surgical cultures were subsequently positive for *S sanguis*. The patient received intravenous cefazolin in the hospital for 2 weeks, followed by intravenous ceftriaxone at home for 3 weeks. At follow-up on September 2, 1997, he was afebrile and had only minimal residual warmth and swelling of the right knee. Range of motion was satisfactory.

DISCUSSION

S sanguis, a member of the viridans group of streptococci, is part of the normal flora of the mouth and upper respiratory tract in humans.⁶⁻¹⁰ These organisms are traditionally considered of low virulence, lacking exotoxins that characterize the hemolytic streptococci. Septic arthritis due to viridans group streptococci in general and *S sanguis* in particular has been reported only rarely. Two comprehensive reviews of the topic do not mention viridans group streptococci as etiologic agents in septic arthritis.^{11,12} Barbadillo et al¹³ described an 83-year-old man with severe underlying osteoarthritis who had septic arthritis of the knee due to “*Streptococcus viridans*” (no speciation given).

Table 1. Synovial Fluid Findings

Findings	July 15, 1997	July 27, 1997*	July 29, 1997
White blood cells			
Total ($\times 10^9/L$)	24.1	13.9	22.8
Neutrophils (%)	95	95	99
Crystals	Negative	Negative	Negative
Gram stain	Negative	Negative	Negative
Culture	Negative	<i>S sanguis</i>	<i>S sanguis</i>

*Date of hospital admission.

Blankstein et al¹⁴ described a previously healthy 48-year-old man who had septic arthritis caused by nonspeciatic viridans streptococci affecting the acromioclavicular joint after blunt trauma.

There are only 2 previous reports of septic arthritis due to *S sanguis*. Nitsche et al¹⁵ described a young patient with polymicrobial infection of the sternoclavicular joint due to *S sanguis* and *Pasteurella multocida*. Recently, Weber et al¹⁶ reported 3 cases of spondylodiscitis caused by viridans streptococci. No obvious source of infection was determined in the above-mentioned reports. However, Patrick and Lewis¹⁷ described a previously healthy 56-year-old man with obvious dental caries who had septic arthritis of the knee due to *S sanguis*. To our knowledge, our patient represents the second documented case of monomicrobial septic arthritis due to *S sanguis*. He had severe periodontal disease, for which he was treated with multiple episodes of débridement; although blood cultures at the time of admission were negative, it is postulated that he experienced transient bacteremia from a dental source leading to involvement of a previously abnormal joint. Although viridans streptococci are rare causes of septic arthritis in native joints, they should be considered in the differential diagnosis of this disorder in the setting of severe periodontal disease.

REFERENCES

1. Baker DG, Schumacher HR Jr. Acute monoarthritis. *N Engl J Med*. 1993;329:1013-1020.
2. Dubost JJ, Fis I, Denis P, et al. Polyarticular septic arthritis. *Medicine (Baltimore)*. 1993;72:296-310.
3. Le Dantec L, Maury F, Flipo RM, et al. Peripheral pyogenic arthritis: a study of one hundred seventy-nine cases. *Rev Rhum Engl Ed*. 1996;63:103-110.
4. Peters RH, Rasker JJ, Jacobs JW, Prevo RL, Karthaus RP. Bacterial arthritis in a district hospital. *Clin Rheumatol*. 1992;11:351-355.
5. Youssef PP, York JR. Septic arthritis: a second decade of experience. *Aust N Z J Med*. 1994;24:307-311.
6. Facklam RR, Washington JA II. Streptococcus and related catalase-negative gram-positive cocci. In: Balows A, Hausler WJ Jr, Herrmann KL, Isenberg HD, Shadomy HJ, eds. *Manual of Clinical Microbiology*. 5th ed. Washington, DC: American Society for Microbiology; 1991:238-257.
7. Gibbons RJ, Houte JV. Bacterial adherence in oral microbial ecology. *Annu Rev Microbiol*. 1975;29:19-44.
8. Johnson CC, Tunkel AR. Viridans streptococci and groups C and G streptococci. In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases*. Vol 2. 4th ed. New York, NY: Churchill Livingstone; 1995:1845-1861.
9. Marsh P, Martin M. *Oral Microbiology*. 2nd ed. Washington, DC: American Society for Microbiology; 1984.
10. Washington JA. Medical bacteriology. In: Todd JC, Sanford AH, Davidsohn I, Henry JB, eds. *Clinical Diagnosis and Management by Laboratory Methods*. 16th ed. Philadelphia, Pa: WB Saunders Co; 1979:1574.
11. Mikhail IS, Alarcon GS. Nongonococcal bacterial arthritis. *Rheum Dis Clin North Am*. 1993;19:311-331.
12. Pioro MH, Mandell BF. Septic arthritis. *Rheum Dis Clin North Am*. 1997;23:239-258.
13. Barbadillo C, Trujillo A, Cuende E, Mazzucchelli R, Mulero J, Andrew JL. Septic arthritis due to streptococcus viridans. *Clin Exp Rheumatol*. 1990;8:520-521.
14. Blankstein A, Amsallem JL, Rubinstein E, Horosowski H, Farin I. Septic arthritis of the acromioclavicular joint. *Arch Orthop Trauma Surg*. 1985;103:417-418.
15. Nitsche JF, Vaughan JH, Williams G, Curd JG. Septic sternoclavicular arthritis with *Pasteurella multocida* and *Streptococcus sanguis*. *Arthritis Rheum*. 1982;25:467-469.
16. Weber M, Gubler J, Fahrer H, et al. Spondylodiscitis caused by viridans streptococci: three cases and a review of the literature. *Clin Rheumatol*. 1999;18:417-421.
17. Patrick MR, Lewis D. Short of a length: *Streptococcus sanguis* knee infection from dental source. *Br J Rheumatol*. 1992;31:569.