Septic Arthritis due to *Streptococcus sanguis*

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**ABSTRACT**

Septic arthritis may represent a direct invasion of joint space by various microorganisms, including bacteria, viruses and fungi. Although any infectious agent may cause bacterial arthritis, bacterial pathogens are the most significant because of their rapidly destructive nature. We present a case of septic arthritis in a 56-year-old male patient due to *Streptococcus viridans* which is a member of the viridans group streptococci. The patient was admitted to Our Hospital presented with fever of unknown origin, losing more than 30 kg of body weight during couple of months, and anemia of chronic disease as paraneoplastic process. He had a long history of arterial hypertension and stroke. There was swelling and pain of the right sternoclavicular joint and precordial systolic murmur in physical status. A large diagnostic panel has been made, computerized tomography (CT) of right sternoclavicular joint showed widening of periarticular soft tissue and loss of clavicular corticalis. Cytologic analysis of synovial fluid showed more than 90% of polymorphonuclear leukocytes. There were no crystals on microscopic examination and Gram stain of fluid was negative. Blood cultures were positive for *S. sanguis* and there was a consideration about possible periodontal disease. Stomatologic examination verified periapical osteitis and extraction of potential cause of infection has been done. Therapy with benzilpenicilline was followed by the gradual improvement of clinical and laboratory parameters. Although viridans group streptococci and *Streptococcus sanguis* in particular are rare causes of septic arthritis in native joints, they should be considered in the differential diagnosis of periodontal disease.

**Key words:** septic arthritis, bacterial arthritis, *Streptococcus sanguis*, peridontal disease

**Introduction**

Septic arthritis, also known as infectious arthritis, may represent a direct invasion of joint space by various microorganisms, including bacteria, viruses, mycobacteria, and fungi. Reactive arthritis, a sterile inflammatory process, may be the consequence of an infectious process located elsewhere in the body. Although any infectious agent may cause arthritis, bacterial pathogens are the most significant because of their rapidly destructive nature. Failure to recognize and to appropriately treat septic arthritis results in significant rates of morbidity and may even lead to death. The 2 major classes of bacterial/suppurative arthritis are gonococcal and nongonococcal. Overall, although *Neisseria gonorrhoeae* remains the most common pathogen (75% of cases) among younger sexually active individuals, *Staphylococcus aureus* infection is the cause of the vast majority of cases of acute bacterial arthritis in adults and in children older than 2 years. This pathogen is the cause in 80% of infected joints affected by rheumatoid arthritis.

*Streptococcal* species, such as *Streptococcus viridans*, *Streptococcus pneumoniae*, and group B streptococci, account for 20% of cases. Septic arthritis of the sternoclavicular joint occurring secondary to a pneumococcal chest infection was first described by Vogelius in 1896. In 1988, Wohlgethan et al performed a comprehensive review of the literature and described 65 cases of sternoclavicular joint infection. They found that abscesses were present in 20% of these cases, irrespective of the type of organism or underlying systemic disease; in almost all cases, the abscess was unilateral. Sternoclavicular joint infection (SCJ) occurs in patients with predisposing risk factors, as intravenous drug use, hemodialysis, infected central venous line, diabetes mellitus and rheumatoid or
other inflammatory arthritis. Other reported risk factors are alcohol abuse, corticosteroid treatment, cancer, trauma, radiation therapy, chronic liver disease, surgery with median sternotomy. Most common noncontiguous foci of infection are pneumonia, cellulitis, endocarditis, urosepsis, septic pulmonary emboli, spontaneous bacterial peritonitis, epidural abscess, intra-abdominal abscess, gingivitis and disseminated tuberculosis. SCJ infection is a potentially life-threatening condition because of tight anatomic connection with the most important chest vascular structures. Very rarely SCJ infection occurs in previously healthy adults².

In this article, we present a case of septic arthritis caused by *Streptococcus sanguis* in a 56-years old male patient.

**Case report**

A 56-year old male patient was admitted to our Hospital presented as fever of unknown origin, he lost more than 30 kg of body weight in less than 6 months and laboratory examination showed anemia of chronic disease as paraneoplastic process. He had long history of arterial hypertension and stroke. On physical examination there was swelling and pain of the right sternoclavicular joint and precordial systolic murmur. In the initial laboratory evaluation, his hemoglobin concentration was lower, there was leukocytosis with neutrophilic predominance and erythrocyte sedimentation rate was elevated. A large diagnostic panel has been made in searching for the loci of infection. A chest X-ray was normal, echocardiogram did not detect any vegetation on the cardiac valves. Examination of abdomen, CNS, bone marrow, immunology parameters, tumor markers, showed no abnormality.

Computerized tomography (CT) of the right sternoclavicular joint showed widening of periarticular soft tissue and loss of clavicular corticais. Synovial fluid was collected by syringe and its analysis demonstrated mixed viscosity and yellow colour, opaque clarity and more than 100 000 WBC/mm³. Cytologic analysis of synovial fluid showed more than 90% of polymorphonuclear leukocytes (Figure 1 and 2). There were no crystals on microscopic examination and Gram stain of fluid was negative. Blood cultures were positive for *S. sanguis* and because of positive cytologic evaluation of synovial fluid, there was a consideration about possible periodontal disease. Stomatologic examination verified periapical ostitis and extraction of potential cause of infection has been done. Therapy with benzilpenicilline was followed by the gradual improvement of clinical and laboratory parameters.

Although viridans group streptococci and *S. sanguis* in particular are rare causes of septic arthritis in native joints, they should be considered in the differential diagnosis of periodontal disease. A reasonable amount of aspirated synovial fluid is the best argument in favour of an objective articular disorder. In our case, such a simple evaluation (differential cell count analysis) was very helpful in making a diagnosis.

**Discussion**

Streptococcal septic arthritis accounts for 15–30% of all nongonococcal causes of bacterial arthritis in adults³. *S. viridans* has a low virulence, and infection by this microorganism usually appears on previously injured focus, even though its association with dental carries and bacterial endocarditis has been well established. *S. sanguis*,
REFERENCES

1. MOHYUDDIN A, Ear Nose Throat J, 82 (2003) 618. — 2. GAL-
LUCCI F, ESPOSITO P, CARNOVALE A, MADRID E, RUSSO R, UOMO
PAPAIOANNIDES D, BONIATSI L, KORANTZOPOULOS P, SINAPI-
PAPAIOANNIDES D, BONIATSI L, KORANTZOPOULOS P, SINAPI-
PAPAIOANNIDES D, BONIATSI L, KORANTZOPOULOS P, SINAPI-
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Cytologic evaluations have to include both bacterial
and synovial fluid search and analysis for microcrystals.
Paucicellular (<1000 cells/mm3) synovial fluid is obser-
vied in different »mechanical« disorders. In the case of
pursulent synovial fluid the primary diagnosis is septic ar-
thritis. However, the most common etiology is probably

a member of the viridans group of streptococci, is a well
known commensal of the mouth, upper respiratory tract,
lower intestinal tract, genitourinary tract and skin of
healthy humans4,5. Clinical diagnosis requires a high in-
dex of suspicion since symptoms in the region of the SCJ
can be confused with various rheumatic disorders, osteo-
arthritis, hyperostosis, Tietze’s syndrome, abscess, or
tumor. Infection can present with localized swelling with
or without tenderness or decreased range of motion. A
 concise diagnosis is important since management differs
depending on the cause. Laboratory studies usually are
not helpful since an elevated white blood cell count or
sedimentation rate is nonspecific, and blood cultures are
frequently negative. When possible, aspiration of the
joint for Gram stain and culture and cytologic analysis
may be helpful in confirming the diagnosis and direct anti-
biotic treatment. Unfortunately, the failure rate with
this method is high due to technical difficulty in aspira-
tion of the small joint space. Unusual organisms such as
tuberculosis or fungi in an appropriate host also should
be considered6–8.

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SEPTIČKI ARTRITIS UZROKOVAN STREPTOCOCCUS SANGUISOM

SAŽETAK

Septički artritis može nastati nakon izravnog ulaska različitih mikroorganizama (bakterija, virusa, gljiva) u zglobovni
prostor. Bilo koji uzročnik infekcije može dovesti do bakterijskog artritisa, ali bakterijski patogeni su najznačajniji jer
dovode do krzog uništenja zgloba. U radu prikazujemo slučaj 56-godišnjeg bolesnika sa septičkim artritisom uzroko-
vom Streptococcus sanguis koji pripada viridans grupi streptococci. Primljen je u bolnicu pod kliničkom slikom
febriliteta nepoznate etiologije, a u anamnezi se isticao podatak o gubitku više od 30 kg tjelesne težine unazad nekoliko
mjeseci i anemija kronične bolesti ili u sklopu paraneoplastičnog procesa. Duži niz godina se liječio od arterijske hiper-
tenzije, a prebolio je i cerebrovaskularni inzult. U fizičkom statusu nađena je oteklina i bol desneg sternoklaviku-
lnog zgloba te sistolički šum prekordialni. Učinjena je opsežna dijagnostička obrada. Kompjuterizirana tomografija
desnog sternoklavikularnog zgloba pokazala je proširenje periartikularnog mekog tkiva i gubitak kortikalisa klavikule. Citološka analiza sinovijalne tekućine našla je više od 90% polimorfonuklearnih leukocita. Mikrobiološkom analizom sinovijalne tekućine nije nađeno izolata. Hemokulture su bile pozitivne na S. sanguis radi čega se posumnjalo na moguću infekciju zubnog tkiva. Stomatološkom obradom nađe se periapikalni ostitis te je učinjena ekstrakcija zarišta. Započeta je terapija benzilpenicilinom što je dovelo do postupnog poboljšanja kliničkih i laboratorijskih parametara. Iako su viridans streptokoki i S. sanguis rijetki uzročnici septicnog artritisa, potrebno ih je uzeti u obzir ukoliko postoji i periodontalna infekcija.