Ege Journal of Medicine / *Ege Tıp Dergisi* 2016;55(2):95-97

Pseudomonas aeruginosa as a cause of septic arthritis after a sewing needle injury

Dikiş iğnesi ile yaralanma sonrası gelişen septik artrit nedeni olarak pseudomonas aeruginosa

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Abstract

We report the case of 12 years old healthy boy with septic arthritis after a sewing needle injury on his knee. Radiological examination revealed a metallic foreign body in the medial femoral condyle. The case was diagnosed as septic arthritis according to clinical, radiological and laboratory findings. The patient immediately underwent arthroscopic debridement and needle was removed. As the culture result revealed *Pseudomonas aeruginosa* at the second day postoperatively, antibiotic treatment was started and continued for six weeks. The postoperative course was uneventful and joint function returned to normal.

Keywords: Septic arthritis, knee, arthroscopy, treatment.

Öz

Bu yazıda 12 yaşında sağlıklı erkek bir olguda dikiş iğnesi ile yaralanma sonucu dizde gelişen septik artrit sunulmaktadır. Olgunun radyolojik incelemesinde femur medial kondilde metalik yabancı cisim gözlendi. Olguya klinik, radyolojik ve laboratuvar incelemeleri sonucu septik artrit tanısı konuldu. Hemen artroskopik debridman yapılarak yabancı cisim çıkartıldı. Cerrahi sonrası ikinci günde kültür sonucu Pseudomonas aeruginosa şeklinde bildirilen olgunun antibiyotik tedavisi başlandı ve 6 hafta devam edildi. Postoperatif dönem sorunsuz seyretti, hastanın eklem hareketleri normale döndü.

Anahtar Sözcükler: *Septik artrit, diz, artroskopi, tedavi.*

Introduction

Septic arthritis (SA) is relatively uncommon in childhood. The most common causative organism for SA is *Staphylococcus aureus,* with a prevalence of approximately 50% (1). This bacterium is the most commonly found in all age groups, with the exception of children younger than two years of age. *Pseudomonas aeruginosa* rarely causes SA. SA caused by *Pseudomonas aeruginosa* usually occurs in immunocompromised patients, intravenous drug abusers, patients who have suffered traumatic events or in those undergoing invasive procedures (2).

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Received: 25.05.2015 Accepted: 12.06.2015

The knee is the most common site of septic arthritis, followed by the shoulder, hip and ankle (3). The many treatments advocated to date include repeated non-operative needle aspiration, open surgical synovectomy and arthroscopic management by joint lavage with or without synovectomy. The indications of arthroscopic treatment in septic arthritis of native joints remain ill-defined, most notably regarding the criteria for performing repeat arthroscopic lavage (4). We report the case of a twelve-years-old healthy boy, who was admitted three days after being injury by a sewing needle.

Case Report

A twelve-year-old healthy boy was admitted to the pediatric emergency department with fever, pain and swelling in his right knee. His mother was a tailor and she reported that three days prior to admission he had tripped over a bunch of cloths. At that time minimal pain

and swelling has been observed in the area of his right knee, then last two days he had fever over 38 ºC with limping caused by severe knee pain increased gradually with movement and swelling. Physical examination on admission showed a febrile patient in a good condition. His right knee was warm, swollen and tender considerable limitation of active (45º) and passive (35º) range of motion was noted. Blood leukocyte count was $11.4x10^6$ cells/mL with 76% neutrophils. Erythrocyte sedimentation rate was 124 mm/h. Radiographs of the knee showed a metallic foreign body in the medial femoral condyle (Figure-1a). An arthrocentesis yielded 110 mL of purulent, viscous and yellowish fluid. Direct microscopic examination of the fluid revealed many polymorph nuclear leukocytes but no bacteria. Laboratory examination of the joint fluid showed 100.2 x 10^6 leukocytes/ml with 79% neutrophils. Biochemical analysis of the joint fluid showed increased, glucose level compared to blood glucose level and increased lactose dehydrogenase (LDH) level.

Figure-1. a. Radiography of the knee showed a metallic foreign body, **b.** an arthrocentesis yielded of purulent fluid, **c.** the removed foreign body.

The case was diagnosed as SA. The patient underwent arthroscopically joint debridement with joined irrigation up to 3 L and foreign body was removed (Figure-1b,c). Vancomycin 40 mg/kg/day and Piperacillin/Tazobactam 200 mg/kg/day were given to patient intravenously as an empiric antibiotic therapy. The patient remained febrile till to postoperative 48 hours. Swelling decreased but there was still a limited range of motion and no further clinical improvement. As the culture result revealed *Pseudomonas aeruginosa* at the second day postoperatively*, antibiotics were* revised as Piperacillin/Tazobactam and continued to 6^{th} week. The patient remained hospitalized for one further week. The postoperative course including eight week follow-up examination was eventful and joint functioning returned to normal.

Written informed consent was obtained from the parents of the patient for publishing the individual records.

Discussion

Balabaud et al. (4) described a significantly higher treatment success rate in patients treated with arthroscopy, but the effect was linked to a shorter delay in surgery. The study which compared open and arthroscopic treatment of septic arthritis of the wrist also found a significantly higher treatment success rate in the arthroscopy group (5).

SA often occurs in children younger than 5 years of age and the male to female ratio is approximately 2:1 for this disease. The majority of bone and joint infections resulted from hematogenous dissemination; it less frequently follows penetrating wounds or various medical and surgical procedures (arthroscopy, prosthetic joint surgery, steroid injection into joint cavity and various orthopedic and surgical interventions) (6). Arthritis caused by foreign body is a well-known medical emergency especially among children (7). It has been described following injuries from several kinds of plants in tropical areas, but a sewing needle was not described (8).

Pseudomonas aeruginosa thrives not only in normal atmospheres but also in hypoxic atmospheres and thus, has colonized many natural and artificial environments. Inappropriate growth media and inaccurate identification methods could be the reason for negative results in culture identification (9). Therefore the use of methods capable of recognizing *Pseudomonas aeruginosa* is recommended when a history of any metallic object penetration through the joint exists. Being suspicious is always preferable when a penetration joint with a foreign body exists. Although on ultrasound or magnetic resonance imaging examination should be used identify and locate suspected foreign non-metallic bodies but X-ray imaging must be done when metallic foreign body suspected. Removal of the foreign body by arthroscopy combined with intravenous antibiotic therapy seems to be the most effective and appropriate treatment to achieve complete recovery.

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