

A Case of Septic Arthritis After Platelet-Rich Plasma Administration: First Case Report*

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ABSTRACT

A case of septic arthritis following platelet-rich plasma treatment due to knee osteoarthritis is presented in the context of clinical and laboratory findings. A 71 years old male patient with osteoarthritis of the knee had pain, limitation of movement and swelling in the left knee after platelet-rich plasma administration. Diagnosis is made as septic arthritis after the result of physical examination and medical workup. The patient was mobilized by the help of suitable antibiotics and physical therapy application. Osteoarthritis of the knee is one of the important health problems. Despite the fact that many different methods have been applied for the treatment, no definitive treatment method has been determined. The platelet-rich plasma method has become increasingly popular in recent years. Platelet-rich plasma has advantages such as easy application, no need to hospitalization and low side effects, it also has an antibacterial effect. However,

* Makale Geliş Tarihi: 24.02.2021 - Makale Kabul Tarihi: 18.06.2021

DOI: 10.17932/IAU.ASD.2015.007/asd_v07i3007

it should be remembered that a significant complication may occur such as septic arthritis as in all intraarticular applications.

Key Words: *Platelet-rich Plasma, Septic Arthritis, Complication.*

Trombositten Zengin Plazma Uygulaması Sonrası Gelişen Septik Artrit: İlk Olgu

ÖZ

Diz osteoartriti nedeniyle trombositten zengin plazma uygulamasını takiben gelişen septik artrit olgusu, klinik ve laboratuvar bulguları eşliğinde sunuldu. 71 yaşında erkek hasta, sol dizine trombositten zengin plazma uygulaması sonrası gelişen ağrı, kısıtlılık ve şişlik şikâyeti ile kliniğimize başvurdu. Fizik muayene ve laboratuvar bulguları ile septik artrit tanısı kondu. Antibiyotik ve fizik tedavi uygulamasıyla tedavi edildi.

Diz osteoartriti önemli bir sağlık sorunudur. Pek çok farklı tedavi uygulanmasına rağmen, kesin tedavisi yoktur. Trombositten zengin plazma uygulaması, son zamanlardaki en popüler tedavidir. Kolay uygulanması, hastane yatışına gerek olmaması ve yan etkilerinin düşük olması gibi avantajlarının yanında, trombositten zengin plazma uygulamasının antibakteriyel etkisi de vardır. Fakat diğer tüm intraartiküler uygulamalarda olduğu gibi septik artrit gibi önemli bir komplikasyonun ortaya çıkabileceği de unutulmamalıdır.

Anahtar Kelimeler: *Trombositten Zengin Plazma, Septik Artrit, Komplikasyon.*

INTRODUCTION

Platelet-rich plasma (PRP) obtained by centrifugation of autologous blood is used especially for musculoskeletal system injuries (Bava & Barber, 2011). PRP is a quite popular treatment option recently. Platelets regulate cell proliferation and differentiation, angiogenesis, chemotaxis, and inflammation (Lubkowska, Dolegowska & Banfi, 2012; Foster, Puskas, Mandelbaum, Gerhardt, & Rodeo, 2009). In the literature, no significant side effects, other than the effusion and a pain that does not continue more than two days after the PRP injection, have been described (Kon et al., 2010; Sampson, Reed, Silvers, Meng, & Mandelbaum, 2010). It was reported that the PRP administration does not carry the risk of infection (Arcdeep & Kumaran, 2014). Only in one study, possible side effects are reported as pain associated with local inflammatory response in the injection site, infection at the risk rate that may be present in all injections, and scar formation and calcification as remote possibilities (Yılmaz & Kesikburun, 2013).

In our case report, PRP application for therapy of knee osteoarthritis resulting in septic arthritis showing up afterwards is presented in the context of clinical and laboratory findings.

CASE

71-year-old male patient referred with complaints of left knee pain and limitation of movement to the clinic. The patient with complaints of pain in both knees for 5 years had undergone a PRP administration on both knees 15 days before. The next day of PRP, arthroscopic debridement was applied with the diagnosis of septic arthritis to the patient presented with the incapability to walk due to pain, swelling, and hyperthermia on the left knee to the orthopedic department, where the PRP administration was performed. Intravenous (IV) ampicillin-sulbactam 4 x 1.5 grams was started due to the growth of staphylococcus aureus in the synovial fluid culture. The patient had type 2 diabetes mellitus, hypertension and, coronary artery disease but no cigarette/alcohol or IV drug dependence in the medical history. In the physical examination of the patient, who admitted to the physical medicine and rehabilitation clinic with a stretcher because of the fact that his complaints did not decrease, but his limitation of range of joint mobility (ROM) increased although he had been using antibiotics for 12 days, a hyperthermia and a distinct effusion were found on the left knee. The knee was at -20 degree extension and there was severe pain that prevented the ROM evaluation.

There was 90% leucocyte in the direct observation of the aspiration made from the left knee. In the blood tests made, the erythrocyte sedimentation rate (ESR) was 85 mm/hr, C-reactive protein (CRP) was 15.6 mg/dl ($n < 0.8$ mg/dl), blood WBC was 13.93 10³/ul), and blood neutrophil was 10.3 10³/ul (1.63-6.96 10³/ul).

There was no reproduction in the synovial fluid and blood cultures, and the absence of reproduction was attributed to the antibiotic use. IV Ertapenem began to be administered 1gr/day 1x1 with the replacement of the antibiotic administered to the patient diagnosed with infectious diseases. On the 12th of the septic arthritis, cold pack, passive ROM exercises, isometric knee exercises and transcutaneous electrical nerve stimulation were applied to the left knee of the patient for 20 min/day, for 22 days long. The patient with ongoing acute phase reactant values on the 10th day of the Ertapenem treatment was diagnosed with infectious diseases. Ertapenem was discontinued and Teicoplanin was administered 400 mg three times for 12 hours followed by 600 mg 1x1 of maintenance treatment. On the 12th day of the Teicoplanin treatment, the flexion EHA reached up to 120 degrees, pain regressed almost completely and the patient began to ambulate with one crutch. In the pre-discharge tests of the patient who wanted to be discharged, ESH: 70 mm/h, CRP:1.82 mg/dl, WBC:7.2 10³/ul and

neutrophil:4.6 103/ul. A 10-day Teicoplanin dose was prescribed to the patient. The patient who was examined on the 10th day after discharge was ambulating freely and his pains had stopped almost completely.

DISCUSSION

Nowadays, osteoarthritis of knee is one of the important musculoskeletal system illnesses. Despite the fact that many different methods have been applied for the treatment, no definitive treatment method has been determined. The PRP method has become increasingly popular in recent years.

PRP is taken autologously from the patient. Platelet includes various growth factors in the alpha and dense granules. In alpha granules, there are platelet-origin growth factors, transformer growth factor- β , epithelial growth factor and vascular endothelial growth factor and these growth factors regulate the cell proliferation, differentiation, angiogenesis and chemotaxis (Lubkowska, Dolegowska, & Banfi, 2012). Dense granules, however, include bioactive factors such as serotonin, histamine, dopamine, calcium, and adenosine. These bioactive factors increase membrane permeability and inhibit inflammation. Furthermore, they stimulate the removal of necrotic cells and helps tissue reconstruction (Foster, Puskas, Mandelbaum, Gerhardt, & Rodeo, 2009). Besides, these materials are used only for one patient. Therefore, there is no risk of allergy or infectious disease. It was stated that PRP should not be administered in a patient with thrombocytopenia, hypofibrinogenemia, liver disease and malignancy and in acute and chronic infections, pregnant women and breastfeeding mothers, those with autoimmune disease, and patient with sensitivity against blood and blood products (Azzena, Mazzoleni, Abatangelo, Zavan, & Vindigni, 2008).

Many studies performed on the intraarticular PRP injection in knee osteoarthritis focused on the pain reduction and function improvement and the PRP treatment was shown to be influentially by these studies (Sampson, Reed, Silvers, Meng, & Mandelbaum, 2010; Wang-Saegusa et al., 2011; Filardo et al., 2011).

Complications such as infection, distinct muscle atrophy, deep venous thrombosis, fever, hematoma, tissue hypertrophy, and adhesion formation did not develop in patients examined in a study where PRP intra-articular injection was applied to 100 patients with chronic degenerative disease in their knees. However, complications like dull ache and effusion which last 2 days at most following the injection were determined. Studies in the literature show that PRP affects inflammation, reduces postoperative blood loss, infection and the need for narcotics and is effective and safe for wound healing, and soft tissue and bone reconstruction (Rick, Craig, & Mark, 2007).

Advanced age, rheumatoid arthritis, low socio-economic status, iv drug dependence, alcoholism, diabetes, intraarticular injection are the main risk factors

for septic arthritis (Kaandorp, Van Schaardenburg, Krijnen, Habbema, & van de Laar, 1995). Although septic arthritis affects almost all joints, 50% of cases occur in the knee joint. Because the disease quickly causes joint destruction, permanent damage can occur and therefore early diagnosis and treatment are important. Detection of the pathogen in synovial fluid is crucial for the diagnosis but the combination of anamnesis, examination, and elevation of acute-phase reactants is sufficient for the diagnosis and the initiation of the treatment (Newman, 1976). Most patients present to the clinic with joint pain, redness, intraarticular effusion, temperature elevation, limitation secondary to pain in the range of joint motion, and antalgic gait. Fever, trembling and sweating are less frequent systemic symptoms (Gupta, Sturrock, & Field, 2001). The iv antibiotic treatment should start as soon as the diagnosis is made. In addition to the antibiotic therapy, arthroscopic surgical aspiration is needed to remove the septic agent in the joint. Antibiotic treatment is planned according to the most effective agent until obtaining the culture results. Mobilization of the patient should be ensured with first passive and then active EHA, and isometric knee exercises, followed by partial loading on the knee after the infection is brought under control.

Retrospective analysis of patients who developed septic arthritis after intraarticular joint injection showed that these patients used hyaluronic acid and corticosteroid. (Korucu, Türkmen, Özer, Gulec, & Yolcu, 2016).

Although PRP is shown to be harmless in many studies, this case report aims to attract attention to the fact that septic arthritis could occur following the PRP application.

INFORMED CONSENT:

Informed consent was obtained from the patient.

CONFLICT OF INTEREST:

The authors declare no conflict of interest.

FINANCIAL DISCLOSURE:

The authors declared that this study received no financial support

AUTHOR CONTRIBUTION:

Literature reviewing and writing was made by SS, ETA, AY.

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