

SHORT PAPER



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Localized infection and leg ulcer after platelet-rich plasma injection

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Abstract

Although many studies report effective use of platelet-rich plasma (PRP) injection in the clinics, almost no study reports any side effects. The patient who was treated with PRP injection in gastrocnemius muscle developed complications. The authors of this study present a case which may show the possible side effects of PRP.

KEYWORDS

complication, leg ulcer, platelet-rich plasma

1 | INTRODUCTION

Platelet-rich plasma (PRP) is a plasma fraction of autologous blood with a platelet concentration above normal levels, containing many growth factors. The growth factors have various effects on hemostasis, inflammation, regeneration, and PRP is widely used in many areas of medicine, including but not limited to wound healing.^{1,2} In recent years, many researchers have published studies investigating the PRP and have reported that PRP can be used effectively without any side effects or complications.³⁻⁷ Even though one of the possible complications that may occur after PRP treatment is the localized infection, no studies have been reported to the best of our knowledge. Besides, although PRP is used in the treatment of skin ulcers, no ulcer development has been reported following the treatment.

This article presents a case study of a patient who has developed leg ulcer after PRP treatment and *Staphylococcus aureus* (*S. aureus*) infection that was confirmed after wound culture. The authors of this study think that this is the first study reporting the side effects related to the complications mentioned above.

2 | CASE PRESENTATION

A 27-year-old professional male football player admitted to the dermatology clinic due to the ulcerative lesion on his left leg. In the anamnesis, it was mentioned that the day after the football game, the patient had grade II rupture in the left gastrocnemius muscle and

fascia which was confirmed by magnetic resonance imaging (MRI). One day after MRI, the patient was injected with PRP into the left gastrocnemius muscle which was prepared from the patient's own blood sample. During the procedure, the patient had an apparent pain. Within the first 24 h after application, a wound appeared on the injection site as a blister and burst afterward. The patient was admitted to the emergency clinic because of pain, swelling in the leg, and increased fever.

In the examination to assess patient's general condition, he had a high fever of 38°C. Vital signs were within normal ranges. In his dermatological examination, an ulcerative lesion of almost 1 cm diameter in the midline on the left cruris with residue blister around and one pustular lesion was observed (Figure 1). In the area where lesions were seen, the temperature rise was detected with palpation. Several lymph nodes were detected through palpation in the inguinal region. Although the complete blood count, sedimentation, C-reactive protein (CRP) and routine inspections were within the normal ranges when compared to the results obtained in the first examination, the patient was hospitalized after obtaining wound swab culture from the pustule with an empirical treatment of parenteral 1 g sulbactam/ampicillin for three times a day. An increase in the CRP and sedimentation levels of the patient was observed in the following 48 h after the beginning of the treatment. Serum complement 3 and 4, antinuclear antibody (ANA), Anti Ds DNA IgG, IgE, IgA, IgG, Herpes Simplex Virus (HSV) Type I IgM, Anti Varicella IgM, serum c- and p-antineutrophil cytoplasmic antibody (ANCA) levels were all within normal ranges. No sign of deep venous thrombosis (DVT) was seen after performing left lower

extremity Doppler ultrasound examination. There were multiple reactive lymphadenopathies in the left inguinal region, the largest one being 25*11 mm. Moreover, the subcutaneous layer was in an edematous appearance. MRI examination of the left lower leg was performed without intravenous gadolinium. Axial, coronal, and sagittal



FIGURE 1 An ulcerative lesion of almost 1 cm diameter in the midline on the left cruris with residue blister around and one pustular lesion was observed

plane images revealed that the thickness of subcutaneous tissue was increased consistent with edema. Edema was confined to the fatty area with focal fascial involvement (Figure 2A). Adjacent muscular tissue on the medial gastrocnemius muscle showed increased signal intensities in the T2 weighted axial image consistent with edema and shear injury (Figure 2B). When *S. aureus* colonization was detected in wound culture, parenteral teicoplanin treatment was started. The patient was completely recovered on the 10th day. Informed consent was taken from the patient.

3 | DISCUSSION

Platelet-rich plasma has been extensively used for many years and in areas such as musculoskeletal and maxillofacial injuries, orthopedic surgery, and bone grafting cases as well as dermatology. In literature, many studies have reported that PRP treatment is a safe and effective method. However, almost no studies are reporting the side-effects of PRP treatment.

A male patient who has developed leg ulcer following PRP treatment and with the confirmation of local infection through bacterial wound culture results and radiological examination has admitted to the dermatology clinic. Since PRP is an invasive application method, some side-effects such as bleeding, infection, or nerve injury may occur, even if it is unlikely.^{1,2} Also, depending on the skill of the expert who has performed the application, the area, and the preparation process of PRP, some unforeseen complications may develop.

Although PRP is considered as an alternative therapy in sports injuries, our knowledge is still limited on this subject, and the majority of the clinical trials could not report significant benefits.³⁻⁷ Furthermore, PRP is a relatively expensive treatment modality.⁸ In a double-blinded randomized trial of 80 athletes, no significant difference in the time until patients could return to sport or injury recurrence was reported.^{5,6} Another randomized double-blinded trial of

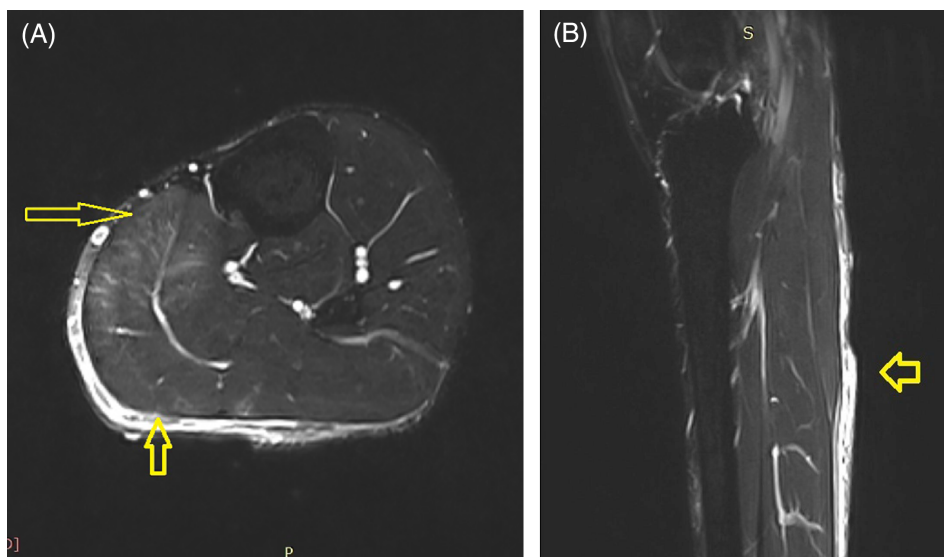


FIGURE 2 A, Edema was confined to the fatty area with focal fascial involvement. B, Adjacent muscular tissue on the medial gastrocnemius muscle showed increased signal intensities in the T2 weighted axial image consistent with edema and shear injury

90 professional athletes with MRI confirmed acute hamstring injury found no benefit in patients with single PRP injection compared to patients who undergo intensive physical therapy.⁷ However, a single-blinded study of 28 patients with hamstring injury reported favorable outcomes with PRP.⁹ Scientific support seems to be limited to the management of muscle strain injuries with PRP. For this reason, physicians should balance the benefits against the potential adverse outcomes.

There is no standardization in the preparation and application of PRP, as well¹ Although PRP injection is claimed to have some antimicrobial effects on *S. aureus* that is resistant-sensitive to methicillin, *Enterococcus faecalis*, and *Candida albicans* in some studies,^{10,11} this obtained effect may be dependent on platelet concentration (P-PRP, L-PRP, P-PRF, and L-PRF). As the antimicrobial activity of PRP is still controversial, the authors of this study think that the complications seen during the process may be due to the mistakes or unstandardized methods of PRP preparation technique.

As the patient admitted to the clinic with an ulcerative lesion on his leg, expressed high levels of pain during the procedure and the bulla was present in the ulcerative region, the patient was treated empirically, which may have prevented the development of necrotizing fasciitis.^{12,13} Possible vascular damage during the PRP injection may have induced this clinical picture.

Consequently, it should be kept in mind that complications after injection are possible even though PRP is safely applied in many clinics. Applying the process under sterile conditions, fully sterilizing the injection area, using known sterile kits during the operation may help to decrease the risk of encountering these complications. The authors of this study believe that further studies should be conducted for the standardization of the methods.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Didem Dincer: manuscript writing, review of the literature, supervision, Efsun Tanacan: review of the literature, manuscript writing, Gul Aslihan Cakir Akay: data collection, manuscript writing, Gokce Kaan Atac: data collection, manuscript writing, Togay Evrin: critical review of the manuscript, manuscript writing.

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