

Ultrasonographically Diagnosed Bicipital Fasciitis: The Importance of Ultrasonography for Early Diagnosis and Emphasis on Aseptic Technique

Ultrasonografi ile Tanı Konulan Bisipital Fasiit: Erken Tanıda Ultrasonografinin Önemi ve Aseptik Tekniğe Vurgu

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Abstract

Here, we present a case of bicipital fasciitis after intraarticular injection of the shoulder joint. Bicipital fasciitis was diagnosed using real-time ultrasonography. The infection was probably due to non-compliance with aseptic conditions. Therefore, we also want to emphasise the importance of using an aseptic technique.

Öz

Bu makalede gerçek zamanlı ultrasonografi ile tanı koyduğumuz, eklem içi enjeksiyon sonrası gelişen bir bisipital fasiit olgusu sunduk. Enfeksiyon muhtemelen aseptik koşullara uyulmaması nedeniyle gerçekleşmişti. Bu yüzden bu yazıda aseptik tekniğin önemini de vurguladık.

Introduction

There are few publications on the bicipital fascia infections in the literature, most of them are on necrotizing fasciitis (NF) of the fascia. It is reported that bicipital fascia infections leads to confusion in differential diagnosis (1). There is a paucity of signs separates necrotising fasciitis from non-necrotising soft tissue infection or inflammation. Patients complain of pain, erythema, and swelling in both conditions, but tense oedema and/or bullae or skin necrosis are reported as diagnostic for necrotising fasciitis (2). Making early diagnosis of NF and making differential diagnosis from non-necrotising fascia infection is important because NF is a condition with significant mortality rate. Mortality for NF has been observed to be approximately 30% and it is reported that delay in definitive treatment because of failure to recognise and diagnose the condition at first presentation is the most common cause

of mortality (3,4). We reported here a case of bicipital fasciitis diagnosed at early stage using real-time imaging with ultrasonography (US) who underwent ultrasound guided aspiration simultaneously. We think, infection was most likely related to non-compliance with aseptic conditions. So, we also want to emphasize the importance of aseptic technique.

Case Report

A 53-year-old female patient was admitted with a complaint of severe pain spreading from her right shoulder to her elbow. Intraarticular sodium hyaluronate injection had been performed one month before due to right shoulder pain. Two days after the injection, the pain began spreading from the shoulder to the volar side of the arm and swelling developed in the volar aspect of the forearm.

The patient had not been able to sleep because of the pain for the past week and was suffering from sweating and fever at night. She did not describe a trauma to the arm or an infection. Locomotor system examination of the neck and upper limbs revealed the following: Right shoulder flexion was limited and painful in the middle of the joint range of motion. Passive movements of the elbow passive were in normal limits but painful. The voluntary flexion and supination of the elbow could not be made due to pain. She had a slight reddening on the skin over the biceps brachii muscle and a 10 cm x 8 cm swelling which was painful in palpation.

The patient underwent ultrasonographic evaluation. Ultrasonographic examination shows intense effusion around the biceps tendon. When the probe was moved towards the biceps muscle, the appearance of the effusion around the tendon disappeared, but a little later, a collection of liquids measuring about 11cm x 6 cm and 15 mm in depth was observed in the biceps fascia (Figure 1A, 1B). Inflammatory tissue gave ++ Doppler signal. Real-time US guided aspiration was performed. Because of the purulent nature of the aspirated liquid (Figure 2), the patient was referred to infectious diseases clinic.

Methicillin sensitive *Staphylococcus aureus* (*S. aureus*) was isolated from the aspirate culture. The patient was hospitalized. Laboratory findings were as follows: Erythrocyte sedimentation rate: 87 mm/h; C-reactive protein: 7.78 mg/dL, white blood cell count: 18,300/mm³, urine culture: contaminant,

biochemical analysis: normal, and brusella agglutination test: negative. 4x1.5 gr/day Sulbactam + Ampicillin treatment was started to the patient. After 11 days, significant improvement was observed and the patient was discharged with oral Amoklavin 2x1 gr/day treatment. At 3 weeks after discharge from hospital, his clinical symptoms declined; pain decreased and range of motion of the shoulder joint increased significantly. Signed consent form was obtained from the patient.

Discussion

The causes of necrotising soft tissue infection in the extremities are usually related to trauma, chronic wound infections, diabetes, obesity, chronic liver disease, immune suppression, alcoholism, intravenous injections, etc. It is usually a polymicrobial rather

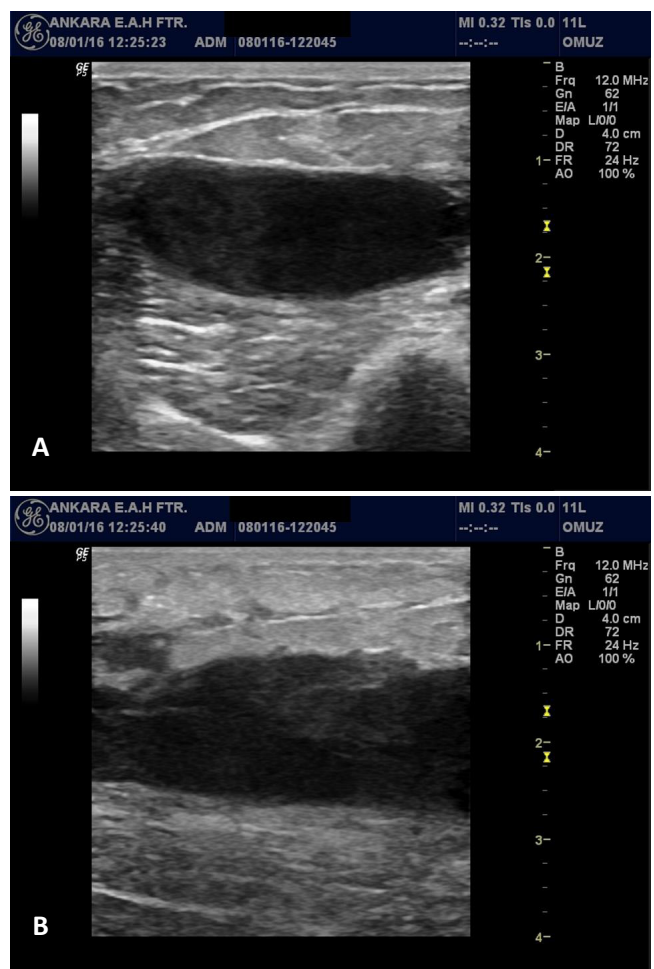


Figure 1. Liquid collection and synovial hypertrophy observed in the biceps fascia. **A)** Sagittal imaging, **B)** Axial imaging



Figure 2. A sample of aspirated fluid

than a monomicrobial infection (5,6). Polymicrobial NF is usually caused by enteric pathogens, whereas monomicrobial NF is usually due to skin flora. Yoshii et al. (7) reported a case of NF due to the injection of oral flora. Monomicrobial infection with *S. aureus* has been rarely reported as a cause of necrotising fasciitis. McHenry et al. (8) reported monomicrobial infections in 12 of 65 patients with NF. Only two of them had *S. aureus* infections. In another study, two of 6 patients with monobacterial infections had *S. aureus* infections among 83 patients with NF (9). *S. aureus* is a ubiquitous pathogen and one of the most common causes of severe community-associated infections of skin and soft tissue (10). It was also isolated from the oral cavity (11). In our case, *S. aureus* may be contaminated from the the patient's skin or oral flora. Moreover it may be contaminated from the oral flora of physician applying the injection procedure to the shoulder. So, we think that, it is important to use aseptic technique while injecting, as well as to use masks especially during periods when upper respiratory tract infections are increasing.

In our case, infection may have reached to bicipital fascia from injection site at the shoulder using fascial way. Stecco et al. (12) described that the pectoralis major fascia appeared to continue with the axillary, deltoid and brachial fascia. They reported that the fascia covering pectoralis major continued with the brachial fascia in two distinct ways: 1. the fascia overlying the clavicular part of pectoralis major had a thickening of collagen fibres extending in direction of the anterior brachial fascia; 2. the fascia covering the costal part continued with the axillary fascia and then with the medial brachial fascia.

US is the most practical and rapid method of obtaining images of the musculoskeletal system. It provides diagnostic benefits in daily clinical practise because it is portable and relatively inexpensive (13). US offers many advantages for patients and physicians. It is well accepted by the patients because

it is a noninvasive method with a quick scan time and without radiation. US also provide several advantages for clinicians. The ability to visualize needles and target structures in real time makes it an ideal tool for the guidance procedures used in diagnosis and management of musculoskeletal diseases. Its flexibility, availability, and low cost make it the best tool to guide interventional therapeutic procedures in musculoskeletal system lesions such as drainages of abscesses, bursitis, treatment of cystic lesions (ganglions, Baker's cysts), arthrocentesis, injection of substances in joints and soft tissues, and aspiration of calcific tendinitis (14).

The early diagnosis of musculoskeletal lesions using US can sometimes protect the patient from serious mortality. Testa et al. (15) reported a case of nonclostridial NF with extensive myonecrosis attributable to infiltrative procedure and detected early by bedside US in emergency department. They concluded that the bedside US may save time for the prompt management of life-threatening necrotising infections. Similarly with this report, in our case, the early diagnose of fasciitis was made possible through US. As shown in the images, blind aspiration of the fasciitis coludn't be possible due to synovial reaction. We able to get fluid sapmls through the US guided technique and thus, we able to make early detection of pathogen. In this way, we can be prevented the development of severe NF which may cause severe mortality.

In this article, we aimed to emphasize the importance of aseptic technique during injection and the use of US in the early diagnosis of soft tissue infections.

Ethics

Informed Consent: Signed consent form was obtained from the patient.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: H.G., B.N., Design: H.G., B.N., Supervision: B.D.Ç., F.Ş.E., Fundings: A.K., Data Collection or Processing: H.G., B.N., B.D.Ç., Analysis or Interpretation: H.G., B.N., F.Ş.E., Literature Search: H.G., B.D.Ç., Critical Review: B.D.Ç., B.N., Writing: H.G.

Conflict of Interest: No conflict of interest was declared by the authors.

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References

1. Dunn F. Two cases of biceps injury in bodybuilders with initially misleading presentation. *Emerg Med J* 2002; 19: 461-2.
2. Wall DB, de Virgilio C, Black S, Klein SR. Objective criteria may assist in distinguishing necrotizing fasciitis from nonnecrotizing soft tissue infection. *Am J Surg* 2000; 179: 17-21.
3. Young MH, Aronoff DM, Engleberg NC. Necrotizing fasciitis: pathogenesis and treatment. *Expert Rev Anti Infect Ther* 2005; 3: 279-94.
4. Bisno AL, Cockerill FR, Bermudez CT. The initial outpatient-physician encounter in group A streptococcal necrotizing fasciitis. *Clin Infect Dis* 2000; 31: 607-8.
5. Kim HJ, Kim DH, Ko DH. Coagulase-positive staphylococcal necrotizing fasciitis subsequent to shoulder sprain in a healthy woman. *Clin Orthop Surg* 2010; 2: 256-9.
6. Green RJ, Dafoe DC, Raffin TA. Necrotizing fasciitis. *Chest* 1996; 110: 219-29.
7. Yoshii Y, Ishii T, Sakai S. Necrotising soft tissue infection of bilateral upper limb caused by the injection of oral bacteria: a case report. *Hand Surg* 2013; 18: 243-6.
8. McHenry CR, Piotrowski JJ, Petrinic D, Malangoni MA. Determinants of mortality for necrotizing soft-tissue infections. *Ann Surg* 1995; 221: 558-65.
9. Brook I, Frazier EH. Clinical and microbiological features of necrotizing fasciitis. *J Clin Microbiol* 1995; 33: 2382-7.
10. Miller LG, Perdreau-Remington F, Rieg G, Mehdi S, Perloth J, Bayer AS, et al. Necrotizing fasciitis caused by community-associated methicillin-resistant *Staphylococcus aureus* in Los Angeles. *N Engl J Med* 2005; 7; 352: 1445-53.
11. Smith AJ, Robertson D, Tang MK, Jackson MS, MacKenzie D, Bagg J. *Staphylococcus aureus* in the oral cavity: a three-year retrospective analysis of clinical laboratory data. *Br Dent J* 2003; 20; 195: 701-3.
12. Stecco C, Gagey O, Macchi V, Porzionato A, De Caro R, Macchi V, et al. Tendinous muscular insertions onto the deep fascia of the upper limb. First part: anatomical study. *Morphologie* 2007; 91: 29-37.
13. Patil P, Dasgupta B. Role of diagnostic ultrasound in the assessment of musculoskeletal diseases. *Ther Adv Musculoskelet Dis* 2012; 4: 341-55.
14. del Cura JL. Ultrasound-guided therapeutic procedures in the musculoskeletal system. *Curr Probl Diagn Radiol* 2008; 37: 203-18.
15. Testa A, Giannuzzi R, De Biasio V. Case report: role of bedside ultrasonography in early diagnosis of myonecrosis rapidly developed in deep soft tissue infections. *J Ultrasound* 2015; 19: 217-21.