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CASE REPORT

A Case of Prosthetic Infection with Candida Growth in the Knee Joint

Diz Ekleminde Candida Üreyen Protez Enfeksiyonu Olgusu

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ABSTRACT

Introduction: Fungal prosthetic joint infections constitute a small part of all prosthetic infection cases, and Candida species are the causative agent in most cases. Most fungal prosthetic joint infections occur after revision arthroplasty.
Case: A 77-year-old male patient underwent a total knee prosthesis operation for the right knee due to Gon arthrosis. About five months later, he was hospitalized and treated due to a bacterial prosthetic joint infection. Eight days after discharge, he reapplied with complaints of swelling, pain, temperature increase, and redness in the right knee. He was hospitalized again due to a prosthetic joint infection. Antifungal treatment was started for the patient due to the growth of Candida albicans in the knee joint. A total of 2.5 months of antifungal treatment was given. The recovered patient continues to be followed up in the outpatient clinic.
Discussion: In this case report, we wanted to emphasize that in the presence of risk factors in prosthetic joint infection, we should not forget that the factor may also be fungus. During the operation, a culture should be taken, and antifungal treatment should be given for effective and long-term fungal-related prosthetic joint infections.

Keywords: Candida, prosthetic joint infection, knee joint

ÖZ

Giriş: Mantar protez eklem enfeksiyonları, tüm protez enfeksiyonu vakalarının az bir kısmını oluşturur ve candida türleri de bu vakaların çoğunluğunda etkendir. Mantar protez eklem enfeksiyonlarının çoğu revizyon artroplastisinden sonra ortaya çıkar.
Olgu: Yetmiş iki yaşında erkek hasta, gonartroz nedeniyle sağ dizine yönelik total diz protez operasyonu uygulanmış. Yaklaşık 5 ay sonra bakteriyel protez enfeksiyonu nedeni ile yatırılarak tedavi edildi. Taburculuktan 8 gün sonra sağ dizde şişlik, ağrı, ısı artışı ve kızarıklık şikayetleri ile tekrar başvurdu. Protez enfeksiyonu nedeni ile tekrar yatırıldı. Hastanın diz ekleminde Candida albicans üremesi olması nedeni ile hastaya antifungal tedavi başlandı. Toplamda 2.5 ay antifungal tedavi verildi. Sorunsuz şekilde iyileşen hasta poliklinik takiplerine devam etmektedir.
Tartışma: Biz bu olgu sunumunda protez enfeksiyonunda risk faktörleri varlığında etkenin mantar da olabileceğini unutmamamız gerektiğini, operasyon esnasında mutlaka kültür alınması gerektiğini ve sonuçta mantar ilişkili protez enfeksiyonlarında etkili ve uzun bir süre antifungal tedavi verilmesi gerektiğini vurgulamak istedik.

Anahtar Kelimeler: protez enfeksiyonu, diz eklemi, Candida

Introduction

Prosthetic joint infection is the leading cause of arthroplasty failure, occurring in 1-2% of cases with prosthetic joint implantation (1). The most common microorganism isolated in all prosthetic joint infections is staphylococci which is seen at approximately 50% (2). Fungal prosthetic joint infections account for <1% of all prosthetic infection cases. Candida species are also a factor in at least 80% of these cases (3).

This article presents a case of prosthetic infection with Candida albicans growth in the knee joint.

Case

A 72-year-old male patient had a total knee prosthesis operation for the right knee due to Gon arthrosis in an external center. He had no history of chronic disease. About five months after the operation, he applied again with the complaint of knee pain. Considering prosthetic joint infection in the evaluation, total knee prosthesis revision first stage operation was performed. The prosthesis was replaced, and a spacer with antibiotics was placed. Due to the growth of methicillin-resistant Staphylococcus aureus in his culture, imipenem and teicoplanin were given for 28 days of treatment and rifampicin for 9 days. The patient, who did not respond to the treatment clinically and laboratory, was referred to our hospital. In our hospital, the infected spacer was replaced by the Orthopedics and Traumatology department, and a new spacer was placed. Cultures were taken during surgery. The consulted patient was started on meropenem 3×1 g intravenous (iv) and daptomycin 1×450 mg IV treatments. On the sixth day of the treatment, the patient was transferred to our service for the continuation of antibiotic therapy. On the 25th day of the treatment, the Orthopedics and Traumatology department was consulted because no treatment response could be obtained. The Orthopedics and Traumatology department replaced the antibiotic spacer, and a new antibiotic spacer was placed. Meropenem treatment was stopped, and daptomycin treatment was continued. Moxifloxacin and tigecycline treatments were started. When the patient was on the 39th day of daptomycin, 14th day of

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moxifloxacin and 13th day of tigecycline, the patient underwent a second-stage operation for total knee prosthesis revision by Orthopedics and Traumatology. The patient, who was treated for another ten days postoperatively, did not have any complaints, so his treatment was stopped, and he was discharged.

Eight days after discharge, the patient applied to the Orthopedics and Traumatology Polyclinic again with complaints of swelling, pain, temperature increase, and redness in the right knee. The Orthopedics and Traumatology department considered prosthetic joint infection, and the patient was hospitalized again. The patient underwent a joint debridement operation. Intraoperative cultures were sent from the joint fluid found in the knee joint. The patient consulted us, so meropenem and daptomycin treatments were started. Yeast fungus grew in the patient's three knee joint fluid cultures on the fifth day of the treatment. The microorganism was identified as Candida albicans by conventional methods (germ tube test, Corn-meal agar microscopy) and VITEK 2 automated system (Biome Rieux, France). Antifungal susceptibility tests were also performed with the VITEK 2 automated system, and it was sensitive to Amphotericin B, caspofungin, micafungin, flucytosine, fluconazole, and voriconazole. The patient consulted us again. The antibacterial treatment of the patient was stopped, and caspofungin treatment was started. In the follow-up, he was transferred to our service, and caspofungin treatment was given for 30 days. He was then discharged with Posaconazole tablets. The treatment was continued for another 1.5 months. The total treatment period of the patient was completed in 2.5 months. The patient's complaints improved.

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İnceleme Yorum / Makroskopik İnceleme

Candida albicans Üredi

Antibiyotik Sonuçları

Bakteri Adı	Antibiyotik Adı	Duyarlılık	MIC	Koloni Sayısı
CANDIDA ALBICANS	AMFOTERISIN B	S	0,5	
CANDIDA ALBICANS	CASPOFUNGIN	S	<=0,12	
CANDIDA ALBICANS	FLUKONAZOL	S	<=0,5	
CANDIDA ALBICANS	FLUSITOZIN	S	<=1	
CANDIDA ALBICANS	MICAFUNGIN	S	<=0,06	
CANDIDA ALBICANS	VORIKONAZOL	S	<=0,12	

Figure 1: Culture result from the synovial fluid in the knee joint

Discussion

Prosthetic joint infection is an expensive and nasty complication after arthroplasty. Fungal prosthetic joint infection is rare following total knee arthroplasty. In a recent review of the English literature in the last 30 years, only 94 cases of fungal infection were reported in knee arthroplasty (4). Although the current incidence of fungal prosthetic joint infections is not known precisely, it is estimated to constitute approximately 1% of all prosthetic joint infections (5). Candida species are also factors in at least 80% of these cases (3). The reason is that among all fungal pathogens, Candida species form a biofilm layer more frequently and quickly in the host compared to other fungal species (6). In our case, it is seen that the microorganism that reproduces in fungal prosthesis infection is Candida albicans, in line with the literature.

Most fungal prosthetic joint infections occur after revision arthroplasty. Risk factors include bacterial prosthetic joint infections, antimicrobial use, immunosuppressive therapy, and diabetes (7,8). In addition, fungal-related prosthesis infections may develop in chronic medical conditions such as kidney disease, malignancy, rheumatoid arthritis, chemotherapy, and liver diseases (9,10). In our patient, bacterial prosthetic joint infection developed first, and then revision arthroplasty was applied. In the following application, there was Candida albicans reproduction. It was seen that our patient had a risk factor for the development of fungal prosthesis infection.

There are no guidelines for the treatment of fungal prosthetic joint infections. Although there are no extensive prospective studies on Candida prosthetic joint infections, the treatment is accepted as a two-stage revision surgery with an antifungal agent (11). However, many different treatment modalities, such as one-stage replacement arthroplasty, debridement procedure, resection arthroplasty, or only antifungal treatment, have been reported, but the results of these treatments are variable (11,12). Surgical intervention was not considered necessary for our patient by the Orthopedics and Traumatology department. Therefore, no surgical procedure was performed. We gave only antifungal treatment to our patient.

Merrer et al. presented an 81-year-old case of prosthetic infection in the left hip. There was Candida albicans growth in the patient's culture. Oral fluconazole (400 mg/day for three months and then 200 mg/day for seven months) was given for ten months. No surgical procedure was applied to the patient. In the follow-up, it was observed that the patient recovered and continued walking healthily (13). In the study of Cobo F. et al., only antifungal therapy was given in the treatment of 11 cases of fungal prosthetic joint infection, and the patients were followed for 3 to 72 months. No adverse results were obtained in any of them (11). Consistent with the literature, our patient was also treated with only antifungal therapy and it was observed that the patient recovered.

The choice of agent for the antifungal treatment of fungal prosthetic joint infections has not been defined. However, echinocandins are the first treatment option because of their broad-spectrum fungicidal activity against Candida species, improved biofilm penetration, and safety profile (14). In the study of Anagnostakos et al., two-stage revision surgery and caspofungin treatment were given for six weeks, and a cure was achieved (12). Hall et al.'s study gave caspofungin treatment for six weeks together with resection arthroplasty. The patient responded positively to the treatment (15). We also gave our long-term patient treatment with caspofungin from the echinocandin group. Afterward, posaconazole treatment was given on an outpatient basis, and a total of 2.5 months of treatment was given. He benefited from the treatment and did not develop any complaints afterward.

In conclusion, Candida infections are rare in prosthetic joint infections. The diagnosis should always be confirmed microbiologically, and antifungal susceptibility testing of Candida strains should be performed. More experience is needed as there is no treatment algorithm in the literature. In this case report, we wanted to emphasize that in the presence of risk factors in prosthetic joint infection, we should not forget that the factor may also be fungus. In addition, cultures should be taken during the operation, and practical and long-term antifungal treatment should be given in fungal-related prosthesis infections.

Authorship Contributions

Conception: Ş.Ç., N.A.D., Ş.S., O.U., Design: Ş.Ç., Ş.S., N.A.D., O.U., Supervision: Ş.Ç., O.U., N.A.D., F.Ç., Resource: Ş.Ç., F.Ç., Ş.S., O.U., Materials: Ş.Ç., H.T.D., F.Ç., Data Collection and/or Processing: Ş.Ç., N.A.D., Analysis and/or Interpretation: Ş.Ç., Ş.S., O.U., Literature Review: Ş.Ç., O.U., N.A.D.i Writer: Ş.Ç., F.Ç., Ş.S., Critical Review: Ş.Ç., H.T.D., O.U.

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