

***Candida Parapsilosis* Arthritis Involving the Ankle in a Diabetes Patient: A Case Report¹**

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Candida parapsilosis is a rare opportunistic fungal pathogen of the musculoskeletal region. Immune function of almost all patients is severely disturbed. Most reported cases of septic arthritis of joints by *Candida* involve the knee, especially *Candida parapsilosis*. To our knowledge, there has been only one case report of *Candida parapsilosis* involving the ankle presented on only plain radiography. We report a case of *Candida parapsilosis* arthritis involving the ankle in a diabetes patient which was shown on MR imaging.

Index words : Mycoses

Ankle joint

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Diabetes Mellitus

Magnetic Resonance Imaging

Candida arthritis is a rare disease which usually occurs in immunocompromised conditions such as AIDS, organ transplantation, hematologic malignancy, and diabetes (1). Among the joints affected by *Candida*, the knee is the most commonly involved joint and few other joints (elbows and hips) have been reported (2). To our knowledge, there was only one report of *Candida parapsilosis* arthritis involving the ankle, but it had radiographic findings only. We present a case of *Candida parapsilosis* arthritis involving the ankle in a diabetes patient and describe the MR imaging findings for the first time.

Case Report

A 63-year-old woman with a 13-year history of diabetes mellitus and hypertension presented at our hospital with right ankle pain and swelling for 4 months. She underwent a trans-sphenoidal adenoidectomy for the pituitary macroadenoma one year previously and had been taking anti-diabetic (metformin) and anti-hypertensive drugs, as well as receiving an insulin shot once a day. She had no history of trauma.

Upon physical examination, the lateral aspect of the right ankle was swollen with joint effusion and tenderness. However, no external wound was evident. Range of motion was nearly full and laboratory findings revealed no definite abnormality except for the mild anemia (hemoglobin of 10.2 g/dL).

On radiographs of the right ankle (Figs. 1A, B), diffuse periarticular soft tissue swelling around the ankle was noted, with joint space narrowing and subchondral

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bone erosion at posteromedial aspect of the tibiotalar joint. An initial MR imaging without contrast enhancement (Figs. 1C, D) showed diffuse synovial thickening

of the tibiotalar joint with joint effusion. Localized fluid collections were also seen along the posterior tibialis, flexor digitorum longus, flexor hallucis longus, and per-



Fig. 1. 63-year-old woman with candida arthritis.

A, B. Anteroposterior (A) and lateral (B) radiographs of the right ankle show asymmetric joint space narrowing and subchondral bone erosion at the posterior and medial aspect of tibiotalar joint (dotted circle). Moderate swelling of soft tissue around the ankle joint is seen.

C, D. Sagittal T1-(C) and fat-suppressed T2-weighted (D) MR images show joint effusion and synovial thickening. Two loose (rice) bodies (open arrows) are seen within the distended joint space, with iso to slightly high signal intensity on T1-weighted image and low signal intensity on T2-weighted image. Distension of the flexor hallucis longus and tibialis posterior tendon sheaths by fluid collection (solid arrows) represents combined tenosynovitis. Subchondral bone erosion was seen at the posterior aspect of the talar dome (arrowheads). Bone marrow edema (asterisks) is noted in the talus as a low and high signal intensity on T1- and T2-weighted images, respectively.

E, F. Four months later, follow-up sagittal T1- (E) and fat suppressed T2-weighted (F) MR images show increased joint effusion and rice bodies within the joint space (open arrows). Destruction of the talar dome by complicated subchondral erosion (arrowheads) is aggravated. Hyperintense bone marrow signals in tibia and talus (asterisks) also progressed, representing concomitant osteomyelitis.

G. Axial fat suppressed T2-weighted image at the tibiotalar joint level more clearly reveals abundant hypointense rice bodies (arrows) and a moderate amount of joint effusion.

oneal tendons. Loose bodies were seen at the distended synovial spaces. These were iso- to slightly hyperintense on T1-weighted images and slightly hypointense on fat-suppressed T2-weighted images. The posterior aspect of the talar dome showed osteochondral lesion. Fluid collections and subtle intrasynovial loose bodies at the posterior subtalar joint and talonavicular joint were also combined. There was prominent hyperintense bone marrow edema in the talus, distal tibia, and calcaneus on T2-weighted images. Mild periarticular soft tissue edema was combined.

Initially, we presumed that the diagnosis was infectious arthritis, such as tuberculous arthritis with associated tenosynovitis and osteomyelitis of the talus. Our differential diagnosis included the pyogenic arthritis or other causes of chronic infectious arthritis including fungal or other bacterial arthritis, neuropathic arthropathy, and inflammatory arthritis such as rheumatoid arthritis.

She underwent open tenosynovectomy and arthroto- my of ankle and hypertrophied synovium was found in the tibiotalar joint. Further, the joint space was filled with a pus-like discharge. Intra-articular rice body-like granulation tissues were found and microscopic examinations revealed chronic inflammatory changes of the synovial tissue. Foreign body reaction was combined and AFB staining and PCR for tuberculosis were also negative.

During the initial empirical antibiotic (3rd generation cephalosporine) treatment, *Candida parapsilosis* was cultured. Despite additional systemic infusion of amphotericin B, right ankle pain and swelling did not subside. Four months later on a follow up MR imaging (Figs. 1E-G), progression of the synovial thickening and loose bodies within the joint space was noted. Gradual progressive destruction of the tibiotalar joint was complicated by the subchondral erosion of the talar dome, and bone marrow abnormality was also noted.

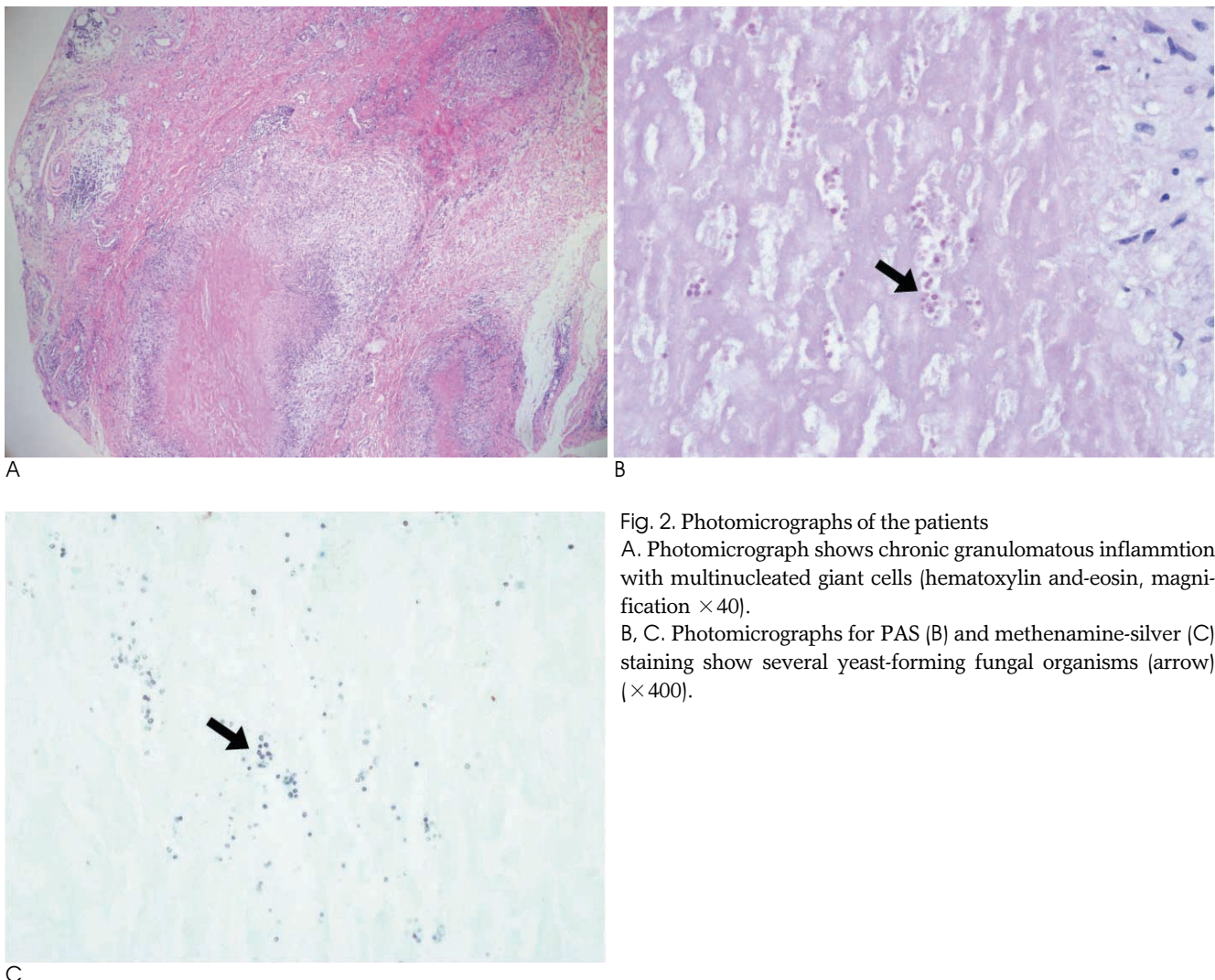


Fig. 2. Photomicrographs of the patients

A. Photomicrograph shows chronic granulomatous inflammation with multinucleated giant cells (hematoxylin and-eosin, magnification $\times 40$).

B, C. Photomicrographs for PAS (B) and methenamine-silver (C) staining show several yeast-forming fungal organisms (arrow) ($\times 400$).

The patient underwent the operative procedure a second time. Microscopic examinations showed chronic granulomatous inflammation with multinucleated giant cells. PAS and methenamine-silver staining revealed several yeast-form fungal organisms (Figs. 2A–C). Despite additional fluconazol treatment, symptoms did not fully subside. Several episodes of pyogenic infection were superimposed, and finally she underwent ankle arthrodesis.

Discussion

Candida infections are very rare in the musculoskeletal system, especially with immunocompetent patients (3). Among them, the most common cases are septic arthritis by *Candida* (3). Many clinical settings where patients are immunocompromised are predisposed to the *Candida* arthritis. Poor immunity triggers the systemic candidemia in patients and finally, inoculation at the targeted joint. On the other hand, direct inoculation by iatrogenic or traumatic events induces septic arthritis by the *Candida* species. Many previous reports showed that variable species of *Candida* are associated with arthritis and spondylitis. Among them, *C. albicans* is responsible for 70% of cases, while the most frequent non-*albicans* species are *C. tropicalis*, *C. parapsilosis*, and *C. krusei*. *Candida parapsilosis* is a relatively rare but emerging opportunistic pathogen, especially when associated with arthroplasty (4).

The knee comprises the majority of involved joint of *C. parapsilosis* throughout the various literature sources. Prosthetic procedures replacing the knee are thought as the crucial point of infection (4). A report suggests another iatrogenic predisposing factor, the intra-articular injection of steroid into a painful knee. Few other joints, such as elbow, hips, and ankle are associated with *Candida* infections (2).

Candida also involves the spine as a form of spondylitis other than synovial joint (5, 6). The sternum is most frequently involved, followed by the vertebrae (5). MR imaging findings of *Candida* spondylitis are similar to those of pyogenic spondylitis (7). Radiographic findings of *Candida* osteomyelitis are nonspecific, including disc space narrowing, irregularity of the end plates, and gradual collapse of the vertebral bodies (6).

Unlike other patients with *Candida* arthritis, diabetes is the only factor contributing the insufficiency of immunity in our patient. No invasive or prosthetic procedure was performed on the ankle of our patient. Most

patients with *Candida* arthritis, especially *C. parapsilosis*, were profoundly immunocompromised, or underwent invasive procedures at the involved joints.

In fact, there is little information about the MR imaging of *Candida parapsilosis* arthritis. As compared with that of more common fungal pathogens, MR imaging of our case disclosed some similar and non-specific findings, including synovial thickening, joint effusion, articular cartilage destruction, subchondral destruction, and marrow edema. However, these findings are not helpful in making a diagnosis. Major differential diagnoses include tuberculosis arthritis and other chronic inflammatory or infectious arthritis. Progressive destruction of joint in our patient is similar to that of pyogenic arthritis. On the other hand, paucity of the cellulitis or sinus tracts around the ankle lowers the probability of pyogenic arthritis. In addition, an indolent but persistent clinical course also contributes to ruling out pyogenic arthritis.

Loose bodies with low signal intensity on T2-weighted images and slightly high to iso signal intensity on T1-weighted images corresponds to the rice body noted on the surgical and pathologic findings. These rice bodies could represent the chronic granulation tissues, especially the proliferation of synovial tissues. These loose bodies could be helpful in differentiating with pyogenic arthritis, one of the major clinical concerns. Rheumatoid arthritis and tuberculous arthritis also have increased synovial inflammation and proliferation, resulting in rice bodies (8). Periarticular cellulitis or abscesses, and articular synovitis is uncommon in fungal disease, which is a minor clue to leading our diagnosis with fungal arthritis rather than tuberculosis (9). In our case, there is tenosynovitis around the ankle, which can be seen in rheumatoid arthritis and tuberculous arthritis. On the other hand, the finding with a lack of periarticular osteopenia on the plain radiography is discriminated from tuberculous arthritis.

Discrimination of the cause of foot pain in the diabetic patients is critical for a successful treatment, and MR imaging could be helpful for the challenging clinical setting. Because of diabetes, some differential diagnoses of our patient are added, such as neuropathic arthropathy.

Large bone marrow edema on the talus was seen in our patient. It can only be a reactive change or combined osteomyelitis. In our case, the extent was large and diffuse, and signal change was prominent on T1-weighted images, which suggests concomitant fungal osteomyelitis. However, this was not confirmed pathologi-

cally (10).

Candida arthritis is treated with surgical debridement and antifungal agents. However, *Candida parapsilosis* arthritis usually has poor prognosis, especially in immunocompromised patients (4). Our patient also has been deteriorated, in spite of aggressive treatment.

In conclusion, we have described a rare case of *Candida parapsilosis* arthritis involving the ankle in a diabetes patient with MR imaging. In patients with immune suppressed condition, especially diabetes, Candida arthritis should be considered in the differential diagnosis of the cause of ankle pain. Imaging features of Candida parapsilosis arthritis are nonspecific with a slow progression. It mimics other chronic infectious or inflammatory arthritis on MR imaging; especially tuberculous arthritis.

References

1. Masoud M, Nasser NJ, Karban A, Edelstein S. Candida parapsilosis septic arthritis in a renal transplant patient. *J Clin Rheumatol*

- 2008;14:56
2. Marmor L, Peter JB. Candida arthritis of the knee joint. *Clin Orthop Relat Res* 1976;133-135
3. Turgut B, Vural O, Demir M, Kaldır M. Candida arthritis in a patient with chronic myelogenous leukemia (CML) in blastic transformation, unresponsive to fluconazole, but treated effectively with liposomal amphotericin B. *Ann Hematol* 2002;81:529-531
4. Trofa D, Gacser A, Nosanchuk JD. Candida parapsilosis, an emerging fungal pathogen. *Clin Microbiol Rev* 2008;21:606-625
5. Miller DJ, Mejicano GC. Vertebral osteomyelitis due to Candida species: case report and literature review. *Clin Infect Dis* 2001;33: 523-530
6. Cha JG, Hong HS, Koh YW, Kim HK, Park JM. Candida albicans osteomyelitis of the cervical spine. *Skeletal Radiol* 2008;37:347-350
7. Munk PL, Lee MJ, Poon PY, O'Connell JX, Coupland DB, Janzen DL, et al. Candida osteomyelitis and disc space infection of the lumbar spine. *Skeletal Radiol* 1997;26:42-46
8. Hsu CY, Lu HC, Shih TT. Tuberculous infection of the wrist: MRI features. *AJR Am J Roentgenol* 2004;183:623-628
9. Parmar H, Shah J, Patkar D, Singrakhia M, Patankar T, Hutchinson C. Tuberculous arthritis of the appendicular skeleton: MR imaging appearances. *Eur J Radiol* 2004;52:300-309
10. Karchevsky M, Schweitzer ME, Morrison WB, Parellada JA. MRI findings of septic arthritis and associated osteomyelitis in adults. *AJR Am J Roentgenol* 2004;182:119-122

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당뇨병 환자의 족관절에서 발생한 *Candida Parapsilosis* 감염: 증례 보고¹

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성진경 · 천경아

칸디다파라프실로시스(*Candida parapsilosis*)는 근골격계에서는 드물게 발생하는 진균 감염으로 흔히 면역기능이 저하된 환자에게 발생한다. 그동안 보고된 증례는 무릎관절이 대부분이었고 족관절은 단 1예로 X-선 사진만 있었다. 저자들은 당뇨병환자의 족관절에서 발생한 *Candida parapsilosis* 감염 증례를 자기공명영상 소견과 함께 보고하고자 한다.