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Torulopsis candida, a New Opportunistic Pathogen

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We describe the first documented case of intravenous-catheter-associated fungemia caused by *Torulopsis candida* (*Candida famata*). The microorganism was isolated from two blood cultures and one intravenous catheter tip in a bone marrow transplant patient. Both the intravascular cannula and the immunological status of the patient are believed to have played major roles in predisposing the patient to such an infection. Uneventful recovery occurred after the removal of the catheter and amphotericin B therapy.

Unusual species of yeasts are occasionally reported as etiologic agents of fungemia and other systemic infections (7, 11, 12). These infections are usually nosocomial in origin. Immunosuppression, intravenous catheters, and broad-spectrum antibiotics are considered to be among the major predisposing factors (14). The yeast involved in this case report can indeed by considered a reluctant pathogen. Although *Torulopsis candida* (*Candida famata*) was isolated previously from humans, it has never been documented as an etiological agent (4).

The patient was a 34-year-old male for whom a diagnosis of chronic myelogenous leukemia was made in May 1985. A remission was achieved with chemotherapy, and on 18 August the patient underwent an allogeneic bone marrow transplantation. As a pretransplantation routine procedure, a large-bore intravenous catheter was inserted in the subclavicular vein 8 days before the operation. By day 21 after the transplantation, engraftment had been noted. Ten days later, the patient became febrile and lethargic. A physical examination failed to reveal any abnormalities at the site of insertion of the intravenous catheter. The leukocyte count was 3,200/mm^3. Two blood specimens were drawn, one from a peripheral vein and the other from the intravenous catheter. They were cultured in commercially prepared blood culture bottles containing 50 ml of tryptic soy broth with 0.03% SPS (sodium polyanethosulfonate) and CO_2 (Institut Armand-Frappier Inc., Laval, Quebec, Canada). Only one bottle was prepared per specimen, and it was not vented during incubation. Within 24 h at 37°C, the broth in both bottles became turbid. Gram stains and subcultures on 5% sheep blood agar revealed yeast cells in pure culture. The intravenous catheter was then removed. It was cultured semiquantitatively by rolling the tip across the surface of a blood agar plate as described by Maki et al. (8) and subsequently grew more than 15 colonies of yeast cells. Again, a pure culture was obtained, and the organism appeared to be macroscopically and microscopically similar to those isolated from the two blood cultures. The patient was put on intravenous amphotericin B and improved rapidly. Repeat blood cultures during therapy were sterile. Follow-up after completion of a course of amphotericin B (total dose, 500 mg) failed to reveal any relapse.

Identification of the three yeast isolates was first attempted with the API 20C yeast identification system (Analytab Products, Plainview, N.Y.). The resulting biocode number for all three isolates was 6556173. This code number corresponded to a very doubtful identification for *Candida tropicalis*, *Candida lusitaniae*, *Rhodotorula glutinis*, or *Candida parapsilosis* and was considered inconclusive. We realized later that this questionable identification was mainly the result of the inability of this particular strain to assimilate cellobiose and arabinose. By using Wickerham assimilation tests, we confirmed the identity of the yeast in our laboratory as *T. candida*. Our findings were further confirmed by the National Reference Center for Human Mycotic Diseases, Edmonton, Alberta, Canada, and the Fungus Reference Unit at the Centers for Disease Control, Atlanta, Ga.

On Sabouraud dextrose agar the yeast appeared as smooth, cream-colored colonies after 24 h of incubation at 30°C. Microscopic examination revealed round-to-oval cells ranging in size from 3.7 to 5.0 by 2.7 to 4.7 μm. Cultures on cornmeal-Tween 80 agar failed to show any pseudomycelium when inoculated by the Dalmau method. The germ tube test performed in human serum was negative. Glucose and trehalose were weakly fermented after 10 days at 30°C. Wickerham assimilation tests for carbon compounds were positive for galactose, sucrose, maltose, trehalose, raffinose, starch, xylose, ribose, ribitol, mannitol, succinic acid, and citric acid and negative for cellobiose, lactose, L-arabinose, rhamnose, erythritol, and inositol. Both the nitrate assimilation and the urease tests were negative. Susceptibility testing was performed by the broth dilution method. Amphotericin B and flucytosine were tested in M3 broth (Difco Laboratories, Detroit, Mich.) and supplemented yeast nitrogen base (Difco), respectively, as described by McGinnis (9). Ketoconazole was tested in synthetic amino acid medium for fungi (GIBCO Laboratories, Grand Island, N.Y.) instead of Casitone broth (Difco) by a method otherwise similar to the one described by McGinnis for miconazole (9). *Saccharomyces cerevisiae* ATCC 36375 was used as the control strain with all three antifungal agents. The resulting MICs were 0.08 μg/ml for amphotericin B, 0.2 μg/ml for flucytosine, and 0.78 μg/ml for ketoconazole.

Yeasts of the genus *Torulopsis* usually grow on decomposing organic matter (3). *T. candida* was first isolated from air in Japan by Saito in 1922 (10). Since then, it has been isolated from different environmental and animal sources (10). In the clinical laboratory, it is occasionally isolated from the skin (2–4) or the mucosa (3, 5) and is generally regarded as a contaminant (4). In a report on the treatment of 26 cases of fungemia, Albaret et al. (1) indicated that *T. candida* was involved in one case, but they did not provide any clinical or mycological descriptions.

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Kahn et al. (6) demonstrated the ability of *T. candida* to produce systemic disease in cortisone-treated mice, thus indicating a potential to cause disease in immunosuppressed patients. It has also been established that infections in humans caused by other unusual yeasts, through either an intravenous catheter (12) or a penetrating injury (11), can occur in the absence of immunological abnormalities. Our patient was not neutropenic at the onset of fungemia. Nevertheless, he was recovering from a bone marrow transplantation, and both a degree of immunosuppression and the presence of an intravascular device probably contributed to this clinically significant fungemia. Our therapeutic approach was identical to that normally used for the treatment of similar infections caused by commonly encountered yeasts (13). The removal of the catheter and intravenous administration of amphotericin B resulted in complete resolution of the infection.

We have described what to our knowledge is the first documented case of intravenous-catheter-associated fungemia caused by *T. candida*. Although this organism is generally considered a saprophyte, it can also be an opportunistic pathogen. As it colonizes the skin and mucosa, it is likely, with the increase in the number of immunocompromised patients and more frequent use of instrumentation, to be occasionally involved in systemic infections.

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