A Man Presenting with Nodules on Hands and Elbows
(See pages 1114–5 for the Photo Quiz)

Figure 1. A skin nodule 3 cm in length on top of the patient’s right third metacarpophalangeal joint.

Diagnosis: protothecosis.

To determine the cause of the nodules on the patient’s hand (figure 1) and elbow (figure 2), culture of fluid obtained from the right olecranon bursa was performed and revealed *Prototheca wickerhamii*. A methylene blue wet mount revealed the characteristic sporangia with internal septations (figure 3).

*P. wickerhamii* is an acrophyllic algae that is ubiquitous in nature. *Prototheca* have been isolated from tree sap, potato peels, and salt and fresh water (including seawater and water from marshes, ponds, streams, and lakes), as well as sewage and soil [1]. Human infection with this organism is very rare; most patients who are affected have impaired immunity [2, 3]. Human protothecosis most often manifests as cutaneous lesions and olecranon bursitis, but cases of pulmonary and hematogenous involvement have been described. Diagnosis can be made through culture of infected fluid in Sabouraud dextrose agar or by visualization of sporangia containing sporangiospores in histological cross-section. The treatment of protothecal infections is not standardized. The majority of isolates described have remained susceptible in vitro to amphotericin B and itra-
Prototheca wickerhamii.

Figure 3. Prototheca wickerhamii, with the characteristic internally septated endospores visible (methylene blue stain; original magnification, ×1000).

conazole. Recent in vitro studies that have compared voriconazole with amphotericin B and older azoles have shown the former to be very active in vitro against *P. wickerhamii* isolates [4]. One patient with a hand infection was successfully treated with itraconazole and voriconazole [5].

For the strain isolated from our patient, susceptibility testing revealed the following MICs: amphotericin B, 0.5 μg/mL; posaconazole, 4 μg/mL; and voriconazole, 2 μg/mL. Our patient initiated treatment with voriconazole at a dosage of 200 mg orally twice per day and experienced improvement of the lesions. We referred the patient to an orthopedic surgeon to undergo right olecranon bursectomy; however, the patient was admitted to the hospital with an acute exacerbation of his pulmonary condition and died after experiencing cardiac arrest.

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**References**