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Massive septic thrombus formation on a superior vena cava indwelling catheter following *Torulopsis* (*Candida*) *glabrata* fungemia

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Abstract Fungal endocarditis is an exceedingly rare complication of indwelling central venous catheters in adults. Here we describe what appears to be the first case of a right atrial thrombus superinfected with the yeast *Torulopsis* (*Candida*) *glabrata* and attached to an indwelling superior vena cava catheter that was not used for parenteral nutrition. A large vegetation-like mass adherent to the catheter tip was visualized by transesophageal echocardiography in a patient who presented with signs of septic pulmonary embolism. Following open-heart surgery, the definitive diagnosis was established by histopathologic examination of the surgical specimen.
Sir: Fungal endocarditis is an exceedingly rare complication of indwelling central venous catheters in adults. Here we describe what appears to be the first case of a right atrial thrombus superinfected with the yeast *Torulopsis* (*Candida*) *glabrata* and attached to an indwelling superior vena cava catheter that was not used for parenteral nutrition.

Case report

A 48-year-old woman with a history of insulin-requiring diabetes mellitus and idiopathic thrombocytopenic purpura treated with splenectomy and intermittent oral prednisone was admitted to the hospital with a bacterial infection of her hip prosthesis.

Two months after initiation of long-term wide-spectrum antibiotic therapy via an indwelling central venous port catheter, she developed a sudden onset of shortness of breath. Her ECG revealed sinus tachycardia, right axis deviation and new T wave inversions in leads $V_{1–3}$ suggestive of an acute right ventricular strain. A ventilation-perfusion scan suggested a high probability of pulmonary embolism. Transthoracic echocardiogram showed a dilated right heart, elevated pulmonary artery systolic pressure (45 mmHg) and a round mass in the superior portion of the right atrium. Multiplane transesophageal echocardiogram revealed a catheter in the superior vena cava with a large, highly mobile excrescence emerging from the catheter tip and extending deep into the right atrium (see Fig.1).

The patient underwent open-heart surgery with successful removal of both the permanent catheter and the adherent friable irregular mass, which measured 3.2×1.2 cm. Microscopic examination of the surgical specimen revealed yeast colonies on a fibrin thrombus. Blood cultures drawn just prior to the surgery grew *Torulopsis* (*Candida*) *glabrata*. After intravenous amphotericin B therapy was initiated, there was a rapid sterilization of blood cultures and a complete resolution of clinical symptoms.

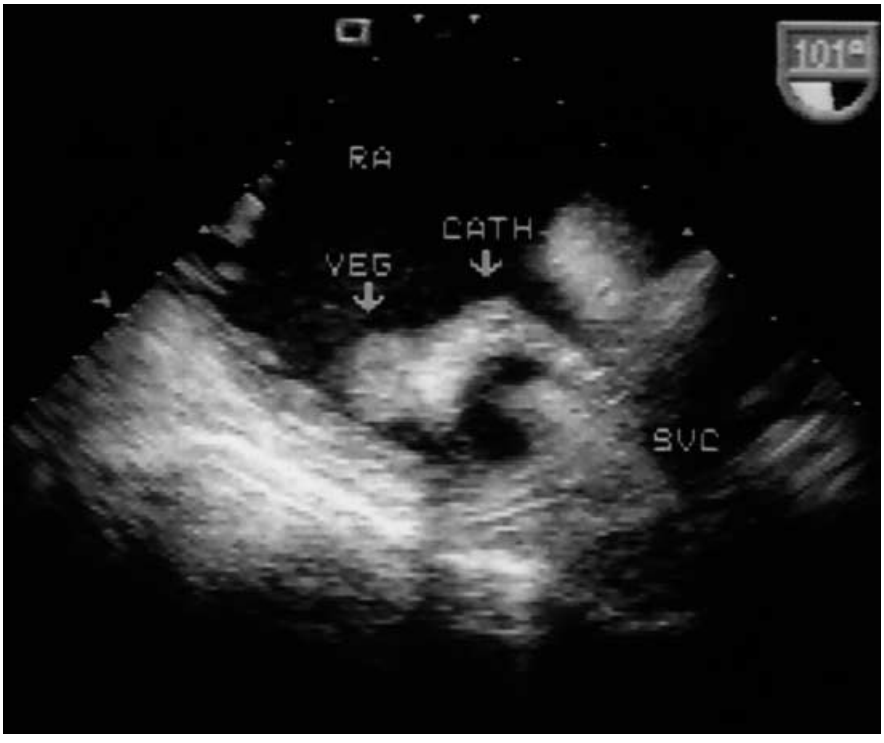

Fig. 1 Multiplane transesophageal echocardiogram in the vertical axis showing an indwelling catheter (*CATH*) in the superior vena cava (*SVC*). A large vegetation (*VEG*) attached to the tip of the catheter extends deep into the right atrium (*RA*). Histopathology of the surgical specimen revealed the mass to be a thrombus superinfected with the yeast *Torulopsis* (*Candida*) *glabrata*

Discussion

Indwelling central venous catheters (ICVC) are used extensively to administer chemotherapy, parenteral nutrition and long-term antimicrobial therapy. In general, the rate of catheter-related complications is low. For instance, in a 5-year prospective study, the overall incidence of complications was 0.09 per 100 days. Most complications were due to either infection (0.02 per 100 days) or thrombosis (0.03 per 100 days) [1].

Superinfection of ICVC-related right atrial thrombi is not uncommon in children [2] but is exceedingly rare in adults [3, 4]. In the few reported cases of septic right atrial thrombi in adults, staphylococci and *Candida albicans* were the most commonly encountered microbial agents [5]. Aside from our patient, it appears that only two other cases of ICVC-adherent septic right atrial thrombosis due to *Torulopsis* (*Candida*) *glabrata* have been reported in English. In both patients the ICVC was used for total parenteral nutrition and in only one case was the infected thrombus visualized by echocardiography [6, 7]. Here we report

what appears to be the first case of a right atrial thrombus infected by *Torulopsis* (*Candida*) *glabrata* and adherent to an indwelling central venous catheter not used for parenteral nutrition.

Torulopsis (*Candida*) *glabrata* is a low-virulence opportunistic pathogen that normally inhabits the skin and the mucosal surfaces of the oropharynx, gastrointestinal tract, urethra and vagina [8]. Most infections are nosocomial and the risk factors include immunosuppression, indwelling catheters, prolonged antibacterial treatment, diabetes mellitus and total parenteral nutrition [9]. The clinical spectrum of disease caused by *Torulopsis* (*Candida*) *glabrata* ranges from asymptomatic fungemia to life-threatening complications. In the case of septic right atrial thrombi, the potentially fatal complications include pulmonary embolism (as seen in our patient) and tricuspid valve obstruction [6]. Since the right atrial septic thrombi are often clinically silent, a high degree of suspicion is required for the correct diagnosis. Transesophageal echocardiography is an excellent imaging modality capable of visualizing the catheter and the adherent septic thrombus directly as well as its impact on surrounding cardiac structures.

When catheter-adherent right atrial septic thrombi are large, and thus prone to potentially life-threatening complications, a combination of surgical thrombectomy, catheter removal and prolonged antifungal treatment are the recommended forms of treatment [10].

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