

Disseminated *Trichosporon asahii* infection in a dog



Antina Lübke-Becker¹, Kathrin Schwegler² and Ingrid Allgoewer³

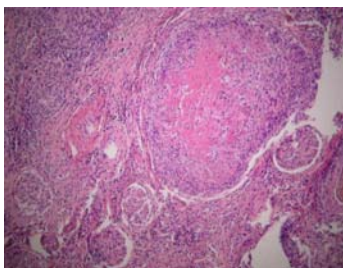
¹Institut für Mikrobiologie und Tierseuchen, Freie Universität Berlin, Philippstraße 13, 10115 Berlin, Germany, ²Institut für Veterinär-Pathologie, Freie Universität Berlin, Robert-von-Ostertag-Str.15, 14163 Berlin, Germany, ³Animal Eye Practise, Spanische Allee 4, 14129 Berlin, Germany

Abstract

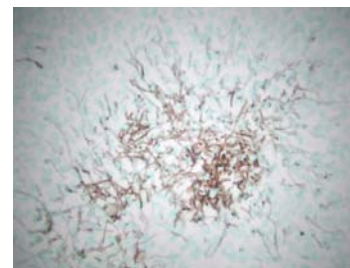
Trichosporon spp. are widely distributed in nature. In humans *Trichosporon* spp. infections are rare but have been associated with a wide spectrum of clinical manifestations, ranging from superficial cutaneous infections and hypersensitive pneumonia in immunocompetent individuals to severe systemic disease in immunocompromised patients. There are only very few case reports of *Trichosporon* spp. infections in animals which are classically associated with intramammary infections in cows. We report the clinical signs as well as the pathological and mycological findings of a disseminated *Trichosporon (T.) asahii* infection in a 4-year-old German Shepherd dog. The most prominent clinical features were unilateral panuveitis with secondary glaucoma, posterior uveitis with subretinal exudate in the other eye and generalized lymphadenopathy. At necropsy, greyish granulomas of different size were present in lymphnodes, spleen, thymus, heart muscle and kidneys. The aortal lumbar lymphnodes were enlarged up to 5 cm in diameter. With Grocott's fungi stain and the periodic acid-Schiff reaction fungal structures were detected inside the granulomas. The hypertrophic and dilated heart showed calcification and a fibrinous endocarditis in the left atrium in which the periodic acid-Schiff reaction revealed fungal structures as well. To our knowledge, this is the first report of an invasive infection caused by *T. asahii* in a dog.



Multiple greyish granulomas in the kidney



Necrotic granuloma in the upper right (kidney, Hämatoxylin-Eosin, x 50)



Fungal structures inside a granuloma (kidney, Grocott, x 250)

Conclusions

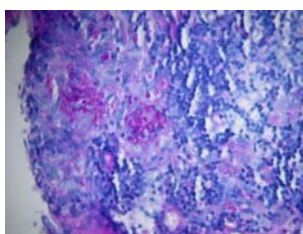
- In cases of generalized lymphadenopathy and panuveitis a spontaneous disseminated infection caused by fungal agents should be considered.
- *T. asahii* is a potential pathogen in dogs causing granulomatous inflammation in multiple organs despite *Trichosporon* spp. are rarely mentioned as animal pathogens and were so far mainly implicated in cases of localized infections. This could be of special interest since the susceptibility of *Trichosporon* spp. to antifungal drugs differs significantly from that of other systemic mycosis causing agents. (Itoh et al. 1996).
- The isolation of *T. asahii* is in accordance to human case reports since this *Trichosporon* sp. is the most common agent of disseminated trichosporonosis.
- Disseminated trichosporonosis can be a principal suspect in differential diagnosis even if the patients do not exhibit common risk factors such as granulocytopenia, impaired phagocyte function, and long-time broad-spectrum antibiotic treatment.

Results

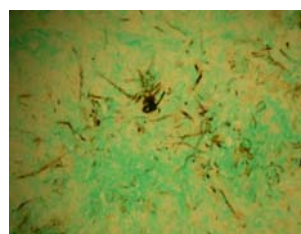
- A disseminated trichosporonosis was diagnosed in a 4-year-old male German shepherd dog.
- Ophthalmologic examination revealed unilateral exsudative panuveitis with secondary glaucoma as well as posterior uveitis with subretinal exudate and hemorrhage in the partner eye.
- General examination showed marked generalized lymphadenopathy.
- Further diagnostics were unable to identify the cause of the disease even though fungal infection was strongly suspected.
- At necropsy granulomatous inflammation was found in multiple organs.
- In lesions of kidney, lymphnodes and heart muscle histochemical staining with Grocott's fungi stain and the periodic acid-Schiff reaction revealed yeast-like cells and septate hyphae along with a few arthroconidia.
- All specimens were culture positive for *Trichosporon* sp..
- Colonies grew within 5 days, initially appearing cream-coloured, smooth, and shiny before becoming slightly dry, heaped-up, and finely wrinkled with an irregular margin.
- Microscopic examination of these colonies as well as of the direct smears revealed oval, yeast-like cells and true hyphae forming cylindrical arthroconidia.
- An excellent *T. asahii* identification profile was obtained with API 20 C AUX.
- The *T. asahii* specific oligonucleotide primers amplified DNA of the isolate and produced an approximately 500-bp fragment.



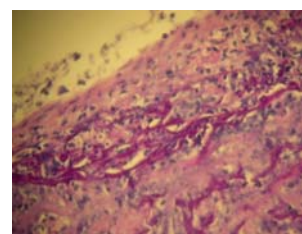
Section of lymphnode with greyish granulomas



Fungal structures in granulomas; (lymphnode, PAS x 400)



Fungal structures in a granuloma (lymphnode, Grocott, x 400)



Fungal structures in the necrotic and fibrinous exudat of the endocarditis (heart, PAS x 400)

Material and methods

Patient

A 4-year-old intact male German Shepherd dog was referred for ophthalmologic examination. The history included a pneumonia 8 months prior to presentation which had been treated with antibiotics and corticosteroids, a pruritic skin condition of unknown cause with a duration of several weeks, marked polydipsia and polyuria as well as weight loss over the last two weeks. Deterioration of the patient's general condition as well as the ocular signs despite treatment lead to euthanasia. The body was submitted for pathologic examination.

Clinical examination

Ophthalmologic and general examination was completed by further diagnostics including repeated fine needle aspiration biopsies of lymphnodes and vitreus for cytologic examination and culturing as well as repeated urine cultures and repeated hemograms and blood chemistries.

Postmortem examination

Specimens of organs with and without granulomatous lesions were fixed in 5% formalin and routinely processed for histopathology. All slides were stained with haematoxylin and eosin (HE). In addition the Grocott's fungi stain and the periodic acid-Schiff reaction were performed on representatively chosen samples.

Isolation of the organism

Specimens of kidneys, spleen, lymphnodes and abdominal granulomas were collected for bacterial and fungal culture at necropsy. For each specimen two plates of Sabouraud dextrose agar were inoculated, with one incubated at 37°C and the other incubated at 28°C. Blood agar (with 5% sheep blood) and Brain Heart Infusion broth also were inoculated and incubated at 37°C.

Identification of the organism

Gram stains were performed directly on all specimens as well as on the resulting colonies. The organism was identified on the basis of morphology, and identification was confirmed by using the commercial identification system API 20 C AUX (bioMérieux) to determine carbohydrate and nitrogen assimilation patterns. Morphologic and physiologic identification was completed by performing a *T. asahii* specific PCR based on sequences of the internal transcribed spacer region according to Sugita et al. (1998). DNA was extracted by the method of de Hoog et al. (2000).

References

- de Hoog et al. (2000). Atlas of clinical fungi. CBS
- Itoh et al. (1996). Mycosis 39: 195-199
- Sugita et al. (1998). J. Clin. Microbiol. 36: 2742-2744