

## Occurrences of Candidiasis in a Fisher's Lovebird and a Budgerigar

Yoshihiko SATO<sup>1)</sup>, Takahiro AOYAGI<sup>1)</sup>, Takashi KOBAYASHI<sup>2)</sup> and Jun INOUE<sup>3)</sup>

<sup>1)</sup>Matsumoto Livestock Hygiene Service Center, 6931 Shimauchi, Matsumoto, Nagano 390-0851, <sup>2)</sup>Kobayashi Animal Clinic, 1338-4 Miwa, Nagano 380-0816 and <sup>3)</sup>Alure Memorial Animal Hospital, 1744 Imachi, Nagano 380-0901, Japan

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**ABSTRACT.** Two cage birds, a two-month-old Fisher's lovebird (*Agapornis fischeri*) and a one-year-old budgerigar (*Melopsittacus undulatus*), manifested clinical symptoms with general weakness, loss of appetite and ruffled feathers, then died. Pathological findings revealed a large quantity of yellowish-white pseudomembrane on the mucosal membrane of the esophagus and crop in these two birds. Histopathologically, blastospores (5.5  $\mu$ m long  $\times$  3.4  $\mu$ m wide) and pseudohyphae were detected in the lesions of conspicuous parakeratosis and moderate acanthosis in the stratified squamous epithelium. These two birds were diagnosed as having had candidiasis.

**KEY WORDS:** cage bird, candidiasis, esophagus.

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Avian candidiasis of the digestive tract is considered to be rare [5], since it is difficult to diagnose clinically in many cases. According to reviews of avian candidiasis [7, 8], serious outbreaks have been recorded in chickens and turkeys, and also in cage birds such as peach-faced lovebirds, pigeons, cockatiels, Amazon parakeets and peacocks [4, 5, 7, 13]. As with other deep-seated mycoses, the diagnosis was usually confirmed by histopathologic examinations [5].

This paper deals with two cases of candidiasis in a Fisher's lovebird (*Agapornis fischeri*) and a budgerigar (*Melopsittacus undulatus*). As far as we know, this is the first report of candidiasis in these species.

**Cases:** Case 1 was a two-month-old Fisher's lovebird with clinical signs of general weakness, loss of appetite and ruffled feathers. The bird was medicated with doxycycline hydrochloride and vitamin complex containing vitamins A, D, E, K<sub>4</sub>, B<sub>2</sub>, B<sub>6</sub> and B<sub>12</sub> subcutaneously. One week later, the bird manifested facial edema, unilateral conjunctivitis and nasal discharge. Despite treatment with metronidazole

orally for suspected trichomoniasis, the bird died three days later. Case 2 was a one-year-old budgerigar which died soon after the onset of clinical signs such as general weakness, loss of appetite and ruffled feathers.

**Pathological examination:** A large quantity of yellowish-white pseudomembrane was seen on the mucosal membrane of the oral cavity, esophagus and crop in Case 1, and of the esophagus and crop in Case 2 (Fig. 1). A moderate number of white foci were observed on the liver in Case 1. Fresh wet smear samples and imprint smear samples from the esophagus and crop were stained by the Giemsa and Gram methods, and examined microscopically. A large number of oval budding yeast-like fungi were seen in Case 1 (Fig. 2) and Gram-positive cocci in Case 2. A moderate number of *Trichomonas* were also seen in Case 1 (Fig. 2). No bacteria and fungi from the liver, heart, spleen, lungs and kidneys were isolated.

Pieces of the esophagus, crop, gizzard, proventriculus, liver, spleen, heart, lungs, kidneys, and intestines were fixed

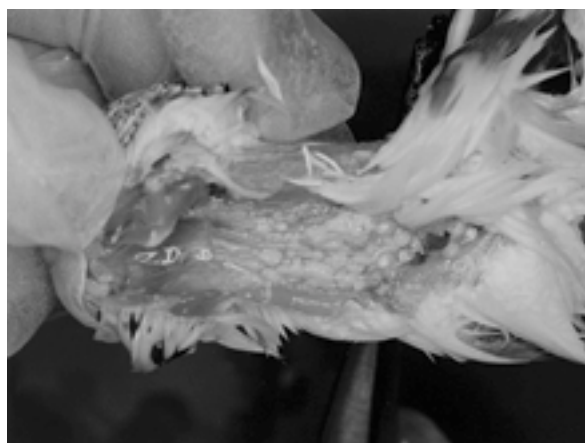


Fig. 1. A large quantity of yellowish-white pseudomembrane was seen on the mucosal membrane of the esophagus (Case 2).

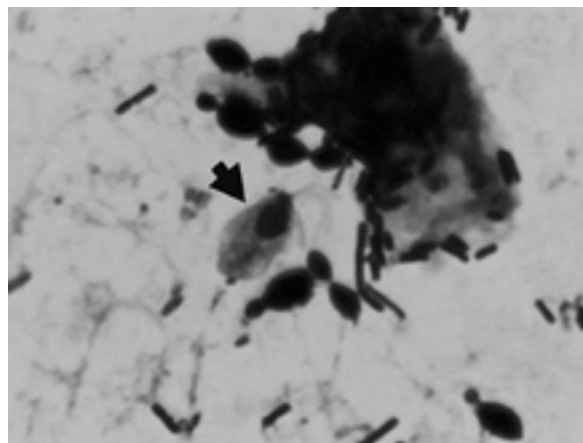


Fig. 2. Oval budding yeast-like fungi were observed in a stained smear sample of the esophagus and a *Trichomonas* cell (arrow) was also seen (Case 1). Giemsa staining,  $\times$  1,200.

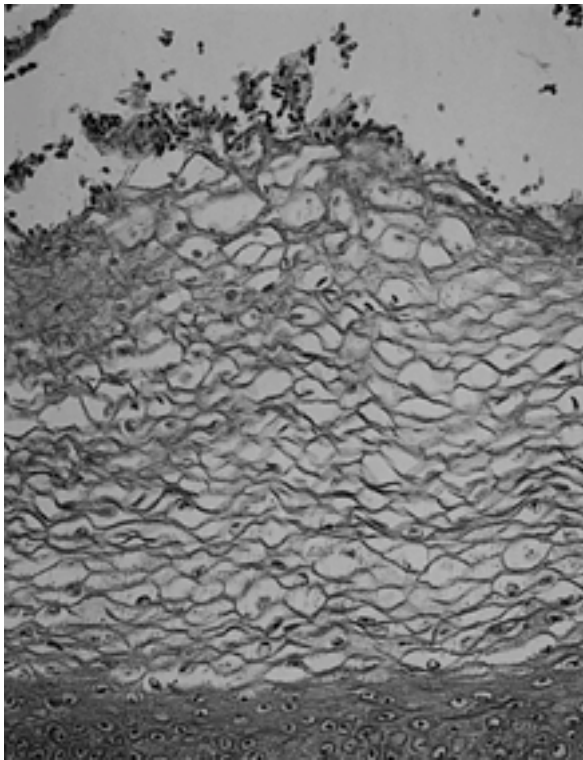


Fig. 3. A large number of oval yeast-like fungi were seen on the surface of the epithelium (Case 1). Conspicuous parakeratosis and moderate acanthosis of the stratified squamous epithelium were also observed in the crop. HE staining.  $\times 270$ .

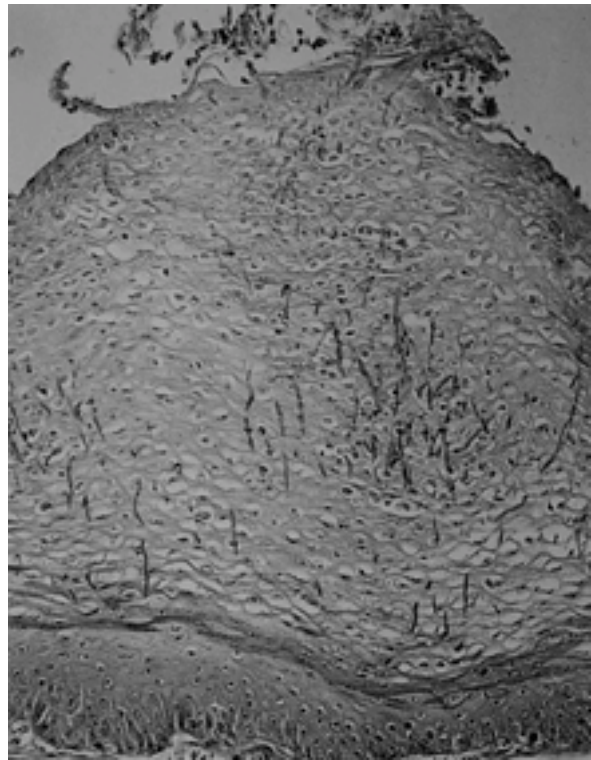


Fig. 4. Proliferation of pseudohyphae of the fungi were observed in the hyperkeratotic layer of the crop (Case 2). PAS staining.  $\times 200$ .

in 10% formalin and paraffin sections were prepared and stained with hematoxylin and eosin (HE), periodic acid-Schiff (PAS) reaction and Gram method. Histopathologically, a large number of oval yeast-like fungi was detected on the surface of the epithelium in the esophagus and crop, and some of them were budding (Fig. 3). Conspicuous parakeratosis and moderate acanthosis of the stratified squamous epithelium were also observed in the esophagus and crop in both birds. Proliferation of pseudohyphae of the fungi were observed in the hyperkeratotic layer (Fig. 4). The characteristics of blastospores (approximately  $5.5 \mu\text{m}$  long  $\times 3.4 \mu\text{m}$  wide) and pseudohyphae were considered to correspond to as genus *Candida* [8]. In Case 1, a small and moderate number of yeast-like fungi with pseudohyphae were also seen in the mucosal membranes of the gizzard and of the duodenum, respectively.

*Candida albicans*, the major causative agent in avian candidiasis [8, 14], has been frequently isolated from the feces of healthy psittacine birds [2]. The infection is generally regarded as an opportunistic infection. In Case 1, *Trichomonas* which is one of the most common protozoan diseases in young cage birds [1, 6, 9, 11, 12] was also detected. Trichomoniasis in birds usually shows caseous lesions in the upper digestive tract [3, 10], which are quite similar to those of candidiasis [7, 8, 14]. However, the organism was not

detected in the lesions of the present cases and typical lesions of trichomoniasis were not observed histopathologically. Also submucosal inflammatory response is seen in trichomoniasis [1, 10, 12]. The two birds were finally diagnosed as having had candidiasis based on the histopathological findings which showed typical lesions of candidiasis in the upper digestive tract.

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