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## STUDIES ON ORAL CANDIDOSIS IN PUPPIES

BY

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### INTRODUCTION

Oral candidosis (Oral candidiasis, moniliasis, thrush, sore) has been recognized particularly in poultry and human infants (Eberth, 1858 and Wilson and Plunkett, 1965). Reports of oral candidosis in swine have appeared frequently in recent years (Stedham et al., 1967). As in poultry and man the infection in swine occurs in the very young piglets which is sometimes fatal (Kovalev, 1947; Quin, 1952; McGréa and Osborne, 1957).

As data concerning canine and feline candidosis is very rare (Jungerman and Schwarzman, 1972), it was of great interest to carry out this study on oral candidosis under natural and experimental conditions in puppies.

### MATERIALS AND METHODS

#### 1. Animals

A total of 9 puppies of 2-3 months old, were admitted to the clinic of Vet. Med. Dept., Faculty of Vet. Med., Cairo University from 1983 to 1985 with a previous history of antibiotic therapy and a complaint of off food. Clinical examination of these puppies revealed buccal lesions.

#### 2. Direct smear examination

Samples were collected from the buccal lesions by means of sterile swabs, from which thin films were made and examined microscopically.

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### **3. Isolation**

Swabs from the buccal lesions were streaked on Sabouraud dextrose agar plates, 2 plates for each swab. The plates were incubated at 37 °C for 5-7 days, then examined daily for the evidence of growth.

### **Identification of the isolated yeasts**

Isolates were identified by direct smears, culture characters and suspected yeasts were subjected to the following tests as described by Refai (1969):

- a. The morphological characters on rice agar plates.
- b. The biochemical reactions: Sugar fermentation and assimilation tests using glucose, maltose, sucrose, lactose, and galactose as well as nitrate assimilation test.

### **Pathogenicity test**

One ml saline suspension of 24 hours yeast culture containing approximately  $4 \times 10^8$  living micro-organisms (estimated by opacity tubes) was inoculated intravenously in rabbits (Weighing about 1 kg), 2 rabbits for each isolate (Huppert et al., 1963). The post-mortem picture was recorded, in addition the yeast was reisolated from heart blood, brain, spleen, lungs, kidneys and livers of dead animals.

Histopathological sections were prepared from the brains, spleen, lungs, livers and kidneys.

### **Therapeutic treatment**

One ml of Mycostatin (SQUIBB-EGYPT, oral suspension ready mixed contains 100,000 units of Nystatin per ml) was dropped into the mouth of each infected puppy 4 times daily for 14 successive days.

### **Experimental study**

Six puppies about 1 month old were used. They were divided into 3 groups, each of two.

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Puppies in group 1 were injected intramuscularly with tetracyclin hydrochloride in a dose rate of 10 mg per kg. body weight daily for 5 successive days, after that, puppies in groups 1 and 2 were streaked on their tongue and cheek mucosa with a pure culture of *C. albicans*. Puppies in group 3 were left as control in contact with the experimentally infected ones. All puppies were kept under observation for a period of one month.

## RESULTS AND DISCUSSION

Clinical findings of the naturally infected 9 puppies revealed that glossitis was the predominant sign. The lesions appeared as white patches on the side and/or the surface of tongue (Fig. 1), while in some puppies these patches appeared scattered over the buccal mucous membrane. It is worthy to mention that the history of previous treatment of these puppies was with either tetracyclin or chloramphenicol during the course of suspected canine distemper or other viral infections.

Mycological examination revealed isolation of *C. albicans* (Fig. 2) from all cases.

Concerning pathogenicity of the isolated *C. albicans* in the present study it was found that all isolates were highly pathogenic and killed rabbits within 2-3 days post inoculation. The post-mortem findings revealed pin-headed yellowish white abscesses scattered in the renal cortex. Moreover, *C. albicans* could be recovered from the heart blood, brain, spleen, kidneys and livers of dead rabbits. These results are in agreement with those of Hasenclever (1959).

Histopathological examination of the renal cortex revealed multiple circumscribed abscesses of varying sizes, surrounded by neutrophils and mono-nuclear inflammatory cells. Various necrobiotic changes were observed also in the renal tubules. Some of the tubular epithelial cells were coalesced to form homogenous acidophilic structureless masses (hyaline casts). Periodic acid Schiff-stained



Fig. 1: Oral lesion in a puppy naturally infected with *C. albicans*.

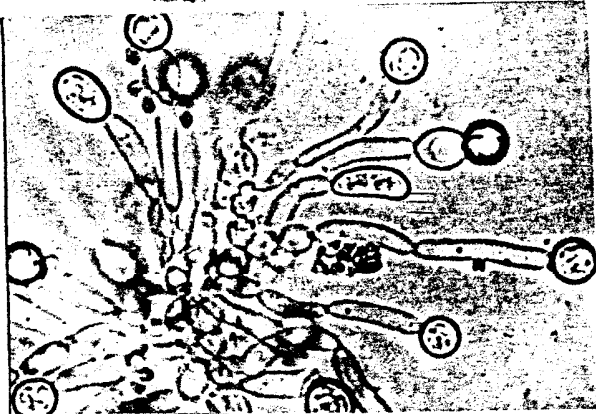


Fig. 2: Chlamydozoospores and pseudohyphae of *C. albicans*. ( x 400 ).

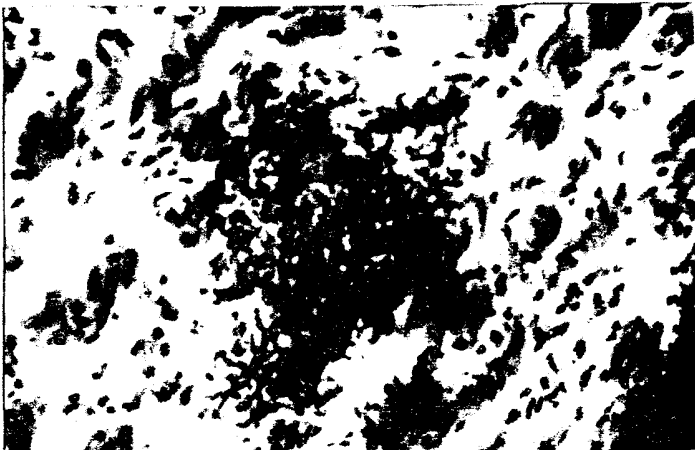


Fig. 3: Kidney of a rabbit inoculated with *C. albicans* showing pseudomycelia and yeast cells. PAS stain ( x 400 ).

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sections showed that yeast cells and pseudomycelia were penetrating the destroyed glomerular structure (Fig. 3). The picture of histopathology is similar to the findings of Evans and Winner (1954), which indicated the destructive effect of *C. albicans* on the kidneys.

In the experimental study, oral lesions appeared only in puppies of group 1 seven days post-infection. The lesions were glossitis with perleche and the tongue was covered with a thick creamy white pseudomembrane which was easily removed leaving a fiery red inflamed surface. *Candida albicans* was reisolated from the oral lesions.

Results of experimental studies, as well as history and clinical findings of the naturally infected puppies clearly indicate that administration of antibiotics specially of long course may play an important role as a predisposing and contributing factor in establishing mycotic infection among puppies. This finding is supported by that of Mills and Hirth (1967).

It is worthy to be mentioned that Nystatin therapy for 12-14 days have a dramatic effect on the recovery of both naturally and experimentally infected puppies.

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### SUMMARY

A total of 9 puppies with a previous history of antibiotic therapy showing oral lesion were examined mycologically. *Candida albicans* was isolated and identified. Puppies experimentally infected with *C. albicans* isolated from the natural cases did not show the typical thrush

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lesion but erosions at the border of the tongue were seen. All naturally and experimentally infected puppies responded well to the treatment with nystatin drops.

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