

## A Case of Equine Endometritis Caused by *Candida albicans*

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**Abstract :** A seven-year old mare had endometritis after history of abortion and repeated intra-uterine infusion of antibiotics. She showed hyperemia and oedema of the cervical mucosa with grayish white purulent discharge. *Candida albicans* was determined to be the causative agent of the endometritis. The diagnosis was established by the direct demonstration of the pathogen in the uterine exudate and its isolation in pure, heavy and luxuriant growth. *In vitro* disc diffusion test showed the organism was sensitive to all the four antifungal drugs tested, which are amphotericin B, clotrimazole, fluconazole and nystatin. The intrauterine nystatin infusion was found very effective as *C. albicans* could not be recovered 7 days after the last treatment.

**Key words :** *Candida albicans*, endometritis, mare, PHOL

### Introduction

Endometritis, a sporadic infectious disorder of the female genitalia, is one of the important causes of reproductive failure. Numerous bacteria of the genus *Bacillus*, *Corynebacterium*, *Enterococcus*, *Escherichia*, *Klebsiella*, *Proteus*, *Pseudomonas*, *Salmonella*, *Staphylococcus* and *Streptococcus* are found to be associated with reproductive disorders of animal<sup>2,7,9,11,12</sup>. The role of fungi in endometritis is little studied. Therefore, the authors wish to place on record a case of mycotic endometritis in a 7-year-old indigenous mare due to *Candida albicans*.

### Case

A seven-year old mare had endometritis after history of abortion and repeated intra-uterine infusion of streptomycin-penicillin combination and tetracycline, respectively for 4 consecutive days after an interval of one week. On physical examination, the animal showed hyperemia and oedema of the cervical mucosa with grayish white purulent discharge.

The uterine discharge was examined directly under light microscope in wet (squash) preparations and in 15% KOH mounts. Smears prepared from the uterine discharge was stained with Gram & PAS stains. Many yeast cells with and without budding and pseudohyphae were demonstrated in wet preparations and KOH mounts. Similar fungal elements which were morphologically simulating to *Candida* were also seen in Gram's and PAS stained smears.

The material was cultured onto the plates and slants of nutrient agar, blood agar, MacConkey agar, Sabouraud dextrose agar with chloramphenicol (50 mg/L) and Pal's

sunflower seed medium (pulverised sunflower seed 450 g, agar 20 g, chloramphenicol 700 mg, distilled water 1000 ml) and incubated at 25 and 37°C (except Pal's medium which was kept at 25°C). The organism grew luxuriantly in pure form on Sabouraud dextrose agar and Pal's medium. No bacterial growth was observed on nutrient agar, blood agar and MacConkey's medium. The growth of the yeast was rapid on Sabouraud dextrose medium and showed many cream-coloured, pasty and smooth colonies at 25 and 37°C. Large, thick-walled, terminal chlamydo-spores and pseudohyphae were seen on corn-meal agar(CMA) at 25°C. The isolate produced germ tube in human serum at 25°C. The detailed morphological, cultural and biochemical examination confirmed the identity of the isolate as *C. albicans*<sup>6</sup>.

Antifungal sensitivity test was conducted using Hi-media (India) discs as described by Bauer and co-workers<sup>1</sup>. Four antifungal discs which comprised of amphotericin B, clotrimazole, fluconazole and nystatin were used against the isolate of *C. albicans*. The degree of inhibition was measured by zone of complete inhibition. The isolate was found sensitive to amphotericin B, clotrimazole, fluconazole and nystatin when tested *in vitro*.

Based on the sensitivity report, the mare was treated by intrauterine infusion of nystatin (400,000 units daily for 4 days). Response of treatment was assessed by collecting uterine swab seven days after the last medication. The sample was subjected for direct microscopy as well as cultural isolation. The animal showed good clinical and mycological responses with nystatin as no yeast could be detected in the specimen after the last treatment.

### Discussion

*C. albicans*, a polymorphic and opportunistic fungus, is implicated in various clinical disorders of human as well as

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animals. The pathogen may infect mucosa, nail, eye, ear, oesophagus, stomach, lung, brain, heart, joint, bone, uterus and mammary gland, etc. The isolation of the organism in pure growth, its direct demonstration in the clinical material, absence of bacteria, presence of oedema, hyperemia with purulent discharge, and good response with antifungal drugs conclusively proved that *C. albicans* was incriminated in the etiology of equine endometritis in the present case.

The pathologic role of *C. albicans* can only be confirmed by isolation in heavy and pure growth and its detection in the clinical material. The mere recovery of the yeast in the absence of direct microscopy cast doubts on its diagnostic significance. In the present case, all the standard criteria of confirming an unequivocal diagnosis was followed. The authors are of the opinion that potassium hydroxide technique can be easily employed in the field remote areas to facilitate an early diagnosis of fungal infection. This may help the physician to start antifungal treatment. However, the isolation of the pathogen can be attempted in good laboratory. Presently, polymerase chain reaction (PCR) is used to make an early diagnosis of the disease. Unfortunately, PCR facility was not available in the Veterinary Public Health Laboratory. We still believe that conventional method of diagnosis interpreted by a well experienced mycologist is still remained as golden standard and can be employed by the laboratories which can not afford sophisticated modern molecular tools for the diagnosis.

The causative significance of *C. albicans* in equine endometritis has been reported earlier by some of the investigators<sup>2,3,4,8,11</sup>. In India, *C. albicans*, *C. tropicalis* and *C. pseudotuberculosis* (*C. Rebya*) have been isolated from the abortions in equines<sup>5,10</sup>. The repeated use of intrauterine antibiotic infusion should be avoided as it may predispose the animals to fungal endometritis. The role of fungal agents in the etiology of endometritis and other reproductive disorders should be further investigated.

### Conclusion

*Candida albicans* was determined to be the causative agent of endometritis in the mare. The diagnosis was established by the direct demonstration of the pathogen in the uterine exudate and its isolation in pure, heavy and luxuriant growth.

*In vitro* disc diffusion test showed that our isolate was sensitive to all the four antifungal drugs tested, which are amphotericin B, clotrimazole, fluconazole and nystatin.

The intrauterine nystatin infusion for 4 consecutive days was found very effective as *C. albicans* could not be recovered 7 days after the last treatment.

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## *Candida albicans*에 의한 말의 자궁내막염 1예

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**요 약** : 유산 후 반복적인 자궁내 항생물질 주입의 병력이 있는 7세의 말이 자궁내막염을 나타내었다. 이 말은 자궁경관 점막의 충혈과 부종을 보였고, 회백색의 화농성 삼출액이 배설되었다. *Candida albicans*가 원인균으로 증명되었으며, 이 진단은 자궁 삼출액의 직접 현미경 검사와 순수 배양물의 검사에 의해 증명하였다. 실험실적 디스크 확산실험에서 병원체가 amphotericin B, clotrimazole, fluconazole 및 nystatin 등 네 가지의 항진균제에 모두 감수성을 나타내었다. 4일간 nystatin 400,000 단위씩을 자궁내 주입하였더니 성공적으로 치유되었으며, 마지막 주입 후 7일에 직접도말 검사와 배양에서 병원체가 다시 발견되지 않았다.

**주요어** : *Candida albicans*, 말, 자궁내막염