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Unilateral pyelonephritis associated with chronic endometritis in a mare

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Abstract

A 14 years old, Thoroughbred mare with the history of chronic endometritis was presented for post-mortem examination at the Department of Veterinary Pathology, Veterinary College and Research Institute, Salem. Septicaemic lesions, unilateral pyelonephritis and endometritis were diagnosed based on the necropsy findings. Grossly, petechial haemorrhages in the pericardium, mild bronchopneumonic changes, a moderately enlarged pale liver with focal infarct, a splenic infarct, purulent discharge in the renal pelvis and a thick, hemorrhagic endometrial wall filled with blood-tinged fluid were observed. A cytological smear from a cervical swab showed marked lymphocytic infiltration. Culture of the renal swab revealed growth of *Enterobacter* and *Staphylococcus* sp. Histopathological examination of endometrium and kidney revealed multifocal congestion, inflammatory cell infiltration predominantly lymphocytes with very scarce neutrophils in the endometrial mucosa and mild periglomerular fibrosis, tubular degeneration and lymphocytic infiltration in the interstitium.

Keywords: Culture, cytology, endometritis, histopathology, necropsy, pyelonephritis

Introduction

Equine endometritis is a major cause of infertility and 60% of mares have been diagnosed with bacterial endometritis (LeBlanc and Causey, 2009) [8]. Generally, if a mare fails to resolve physiological endometritis, it can lead to severe inflammation especially when combined with pathogenic organisms (Christoffersen and Troedsson 2017) [5]. Sometimes, these organisms invade the endometrial glands resulting in infectious endometritis (Petersen *et al.*, 2018) [9]. Bacterial infections in the renal pelvis and parenchyma can lead to pyelonephritis which may be of descending (haematogenous) or ascending origin (Reed *et al.*, 2018; Sprayberry and Robinson, 2015) [10, 15]. The present case describes the occurrence of the unilateral pyelonephritis associated with chronic endometritis in a mare.

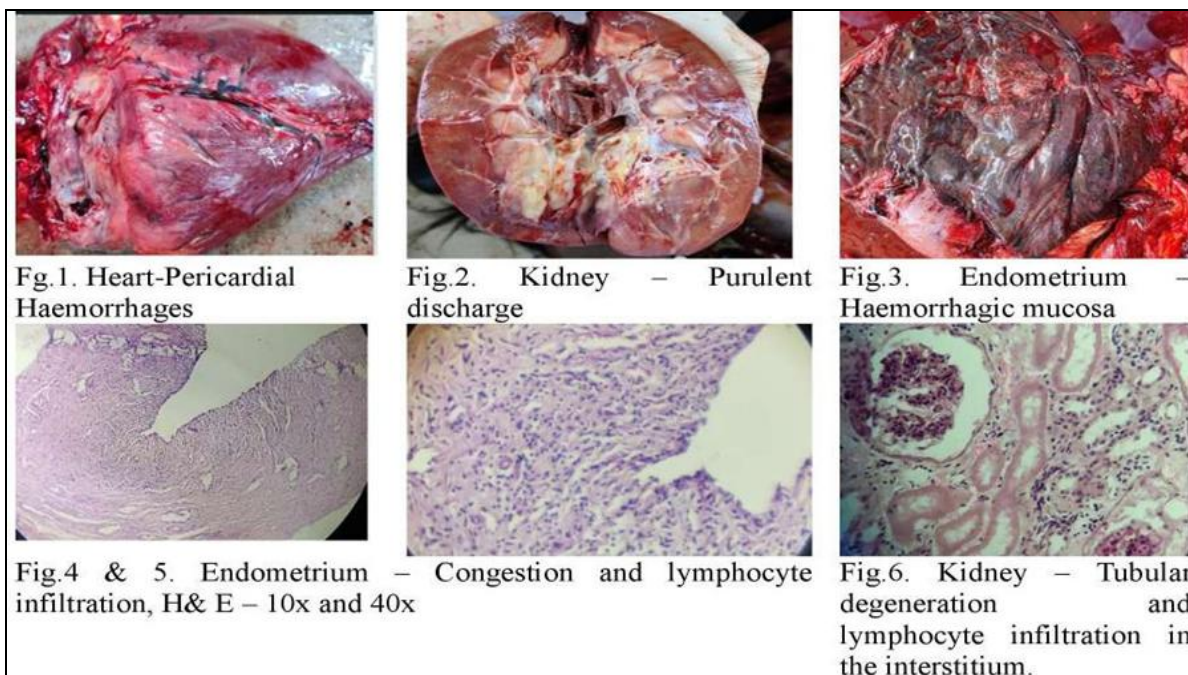
Case history and observations

A 14 years old, Thoroughbred mare with a history of chronic endometritis was presented for post-mortem examination at Department of Veterinary Pathology, Veterinary College and Research Institute, Salem with the clinical history of chronic vaginal discharge for two months and pneumovagina. It was detected by the presence of foamy exudates in the vagina during the rectal examination. The animal was treated with antibiotics and a Caslick's operation/vulvoplasty was performed at the Veterinary Clinical Complex, Veterinary College and Research Institute, Salem, to prevent pneumovagina. Although, the animal initially responded positively to treatment, it eventually succumbed to chronic infection, likely exacerbated by old age and collapsed. Cytological smears were prepared from cervical and vaginal discharge and stained by the Giemsa-Leishman staining method. Sterile swabs from the purulent material in the renal pelvis were collected for bacterial culture. Kidney and endometrium samples were fixed in 10% formalin, processed and stained with Hematoxylin-Eosin (H&E) following the method described by Bancroft and Gamble (2008) [2].

Results and Discussion

Pneumovagina/wind sucking is a common underlying problem in mare that predisposes them to ascending contamination (Samper *et al.*, 2007) [13]. In this condition, the vaginal lumen becomes distended with air and foamy exudates, which interferes with the uterus's protective mechanisms, allowing bacteria, debris and foreign objects to enter the genital tract (Brinsko, 2011a; Brinsko, 2011b) [3, 4]. Ascending bacterial infection and debris accumulation can result in chronic endometritis. Cytological smears from a cervical swab showed marked lymphocytic infiltration, consistent with the observations of Rudolph *et al.* (2017) [12] in case of endometritis. In this case, failure of medical treatment was largely attributed to old age, which reduces uterine clearance; older mare is less resistant to infection and

require longer periods to eliminate irritants from the uterus compared to younger, healthy mares (Samper *et al.*, 2007) [13]. Grossly, petechial haemorrhages were observed in the pericardium and endocardium (Figure 1), along with mild bronchopneumonic changes, a moderately enlarged pale liver with a focal infarct, a splenic infarct, purulent discharge in the renal pelvis (Figure 2) and a thick, hemorrhagic endometrial wall filled with blood-tinged exudate (Figure 3). Histopathological examination revealed multifocal congestion and infiltration of inflammatory cells, predominantly lymphocytes with very few neutrophils, in the endometrial mucosa (Figure 4 & 5) as well as mild periglomerular fibrosis, tubular degeneration and lymphocytic infiltration in the renal interstitium (Figure 6).



In this study, the cardiac lesions confirmed the presence of septicaemic and toxæmic conditions. The mare, clinically diagnosed with chronic endometritis and pneumovagina, succumbed to septicaemia due to chronic bacterial infections and old age. Culture of the renal swabs revealed growth of *Enterobacter sp.* and *Staphylococcus sp.*, findings similar to those reported by Jennifer (2007) [7] and Parveen *et al.* (2020) [14]. Septic nephritis, resulting in abscess/ pus and purulent discharge leads to pyelonephritis which can further cause sepsis, renal failure and death in both humans and companion animals (Ross, 2011; Gorsane *et al.*, 2018) [11, 6]. Therefore, the present case was diagnosed as pyelonephritis associated with chronic endometritis in mare.

In this case, renal lesions may have occurred due to bacterial toxins delivered via the hematogenous route, as well as ascending infections associated with chronic endometritis. The kidney, being a highly vascularized organ, is particularly susceptible to bacterial invasion during septicaemia, placing horses at high risk for septic nephritis (Auer and Stick, 2019) [1]. The observed microscopic lesions in the kidney correlate with these pathophysiological mechanisms.

Conclusion

Based on the results, the mare died due to septicaemic shock by pyelonephritis and chronic endometritis.

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Reference

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