

Short Paper

Pathological study of the uterine tubes in non-pregnant camels (*Camelus dromedarius*) slaughtered in Yazd province, Iran

Nourani, H.^{1*}; Khodakaram Tafti, A.^{2,3} and Kafi, M.³

¹Department of Pathobiology, School of Veterinary Medicine, University of Shahrekord, Shahrekord, Iran;

²Department of Pathobiology, School of Veterinary Medicine, University of Shiraz, Shiraz, Iran;

³Department of Clinical Sciences, School of Veterinary Medicine, University of Shiraz, Shiraz, Iran

*Correspondence: H. Nourani, Department of Pathobiology, School of Veterinary Medicine, University of Shahrekord, Shahrekord, Iran. E-mail: Nourani@vet.sku.ac.ir

Summary

This study was undertaken to investigate the prevalence and characteristics of uterine tubes abnormalities in dromedary camels. The uterine tubes of genital tracts of 96 slaughtered non-pregnant camels were examined grossly and microscopically. The pathological changes observed were salpingitis (2.08%), uterine tube duplication (1.04%), accessory uterine tubes (1.04%), segmental aplasia and hydrosalpinx with cystic hyperplasia of the uterine tubes, ovary and uterus (1.04%). The effects of these abnormalities on fertility of these camels were not detected because the history of their reproduction was not available. In the present study, for the first time, uterine tube duplication, accessory uterine tubes and simultaneous occurrence of cystic changes in uterine tubes, ovary and uterus were reported in dromedary camel.

Key words: Dromedary camel, Uterine tubes, Pathology

Introduction

A clinical diagnosis of uterine tube abnormalities can be made on rectal palpation or ultrasonography if there is gross enlargement and thickening of the tube or severe adhesions involving the tube and adnexa (Kessy and Noakes, 1985; Tibary and Anouassi, 1997). However, less severe abnormalities are not detectable and are only identified on post mortem examination of the genital tracts (Kessy and Noakes, 1985).

There are only a few reports about pathological studies on the uterine tubes of dromedary camels in the literature (Ali *et al.*, 1992; Tibary and Anouassi, 1997; Tibary *et al.*, 2001). Various congenital and acquired abnormalities were diagnosed in these studies including: segmental aplasia, hydrosalpinx, pyosalpinx, salpingitis, infundibular and mucosal cysts (Ali *et al.*, 1992; Tibary and Anouassi, 1997; Tibary *et al.*, 2001).

This study, for the first time, was undertaken to investigate the prevalence and

characteristic gross and microscopic uterine tube abnormalities of non-pregnant dromedary camels in Iran.

Materials and Methods

In this study, the total numbers of 96 non-pregnant genital tracts of female camels slaughtered in Yazd province of Iran were collected. The uterine tubes of these tracts examined grossly for presence of any abnormalities. For histopathological examination, tissue samples were taken from different parts of uterine tubes of 96 cases. The tissue specimens were fixed in 10% neutral buffered formalin, processed and embedded in paraffin, sections of 5 μ m thickness were cut and stained with Haematoxylin-Eosin (H&E) and studied microscopically.

Results

Congenital abnormalities and acquired pathological changes of the uterine tube in

the present study are summarized in Table 1.

Uterine tube duplication was identified in the left uterine tube of one camel (1.04%). The duplicated uterine tubes were separated from each other towards uterus and one of them was incomplete and had blind end in mesosalpinx (Fig. 1). Microscopically, it was similar to normal structure but duplicated. Accessory uterine tubes were diagnosed in one of genital tracts. This accessory tubes measured 10 cm in length and was located in parallel to left uterine tube and joined it at the ampullary region but the other end of this tube was blind in mesosalpinx (Fig. 2). Microscopically, these tubular structures were lined by columnar epithelium.

Segmental aplasia and hydrosalpinx were diagnosed in 1.04% of camels. The right uterine tube was affected with thin and fluctuating wall and was distended by accumulation of about 20 ml clear fluid due to segmental aplasia (Fig. 3). Histopathological examination of the uterine tube with hydrosalpinx showed formation of numerous cysts in the mucosa as cystic hyperplasia. These cysts were lined by cuboidal to columnar epithelium, which showed papillary projections toward the lumen. The lumen of cysts was filled with serous fluid (Fig. 4). The right ovary, left uterine tube and uterus of this genital tract also had cystic changes. The ovary had a luteinized hemorrhagic cyst.

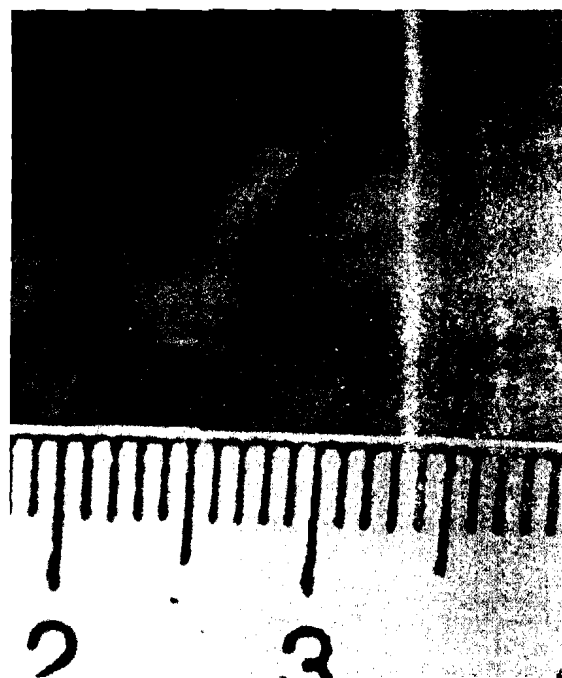


Fig. 1: Duplication of uterine tube in a camel. The apparently normal tube (upper) and the incomplete tube with blind end (arrow) are visible

Salpingitis or inflammation of uterine tube was diagnosed in two cases (2.08%) bilaterally without any gross lesion but they were associated with endometritis. Microscopically, loss of cilia, desquamation of epithelial cells, infiltration of neutrophils and mononuclear inflammatory cells into the lumen and lamina propria of the folds were seen.

Table 1. Different pathological changes observed in 96 uterine tubes of slaughtered camels

Type of abnormality/anomalies	Number of affected camels	Affected camels (%)
Uterine tube duplication	1	1.04%
Accessory uterine tube	1	1.04%
Segmental aplasia and hydrosalpinx	1	1.04%
Salpingitis	2	2.08%
Total	5	5.2%

Discussion

In the present study, a few congenital and acquired abnormalities (5.2%) were diagnosed in uterine tubes of non-pregnant slaughtered camels. Uterine tube duplication and accessory uterine tube were seen in 2.08% of slaughtered camels. These lesions were considered to be congenital anomalies. Congenital abnormalities of the uterine tubes

are rare in domestic animals (Parkinson, 2001). They result from faulty development of the paramesonephric (mullerian) ducts during embryogenesis and may also be associated with certain uterine abnormalities, especially when they occur in association with various forms of intersex (Jones *et al.*, 1997). However, uterine tube abnormalities are not detectable clinically and are only identified on post mortem.

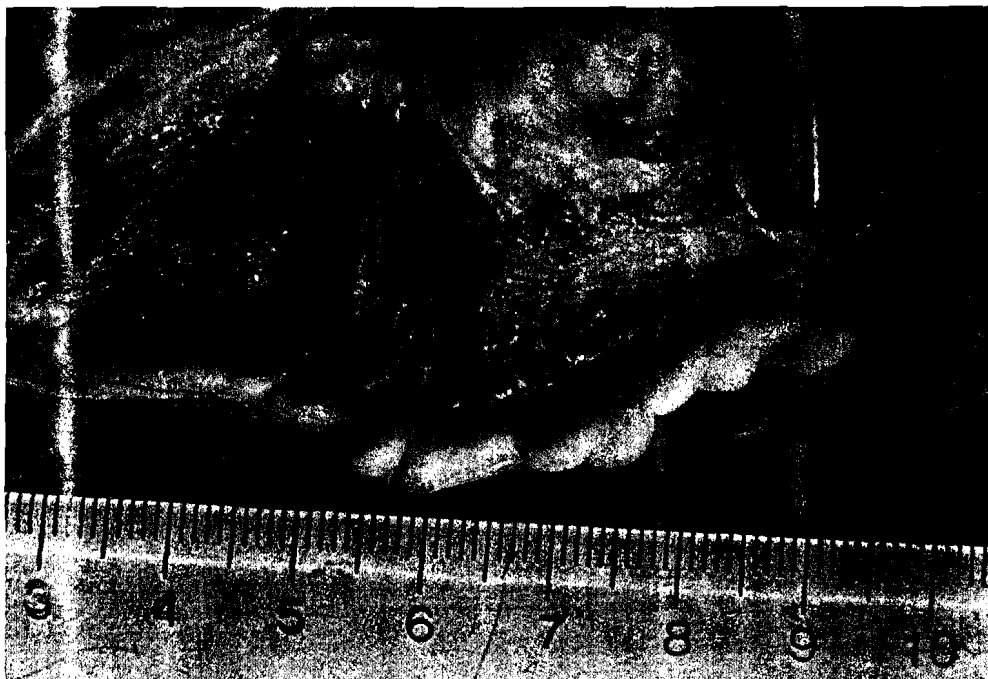


Fig. 2: Accessory uterine tube in a camel. It is very thinner than normal tube and located parallel to the major uterine tube with blind end (arrow)



Fig. 3: Segmental aplasia of uterine tube (arrow head) and hydrosalpinx (arrow) in a camel

examination of the genital tracts (Kessy and Noakes, 1985).

Segmental aplasia of uterine tube and hydrosalpinx was diagnosed in 1.04% of the cases. This is believed to be the first report of segmental aplasia associated with

hydrosalpinx in Iranian dromedary camels. In the dromedary, Tibary and Anouassi (1997) reported occurrence of hydrosalpinx due to segmental aplasia of the uterine tube. The congenital type of hydrosalpinx is more likely due to segmental aplasia of the uterine

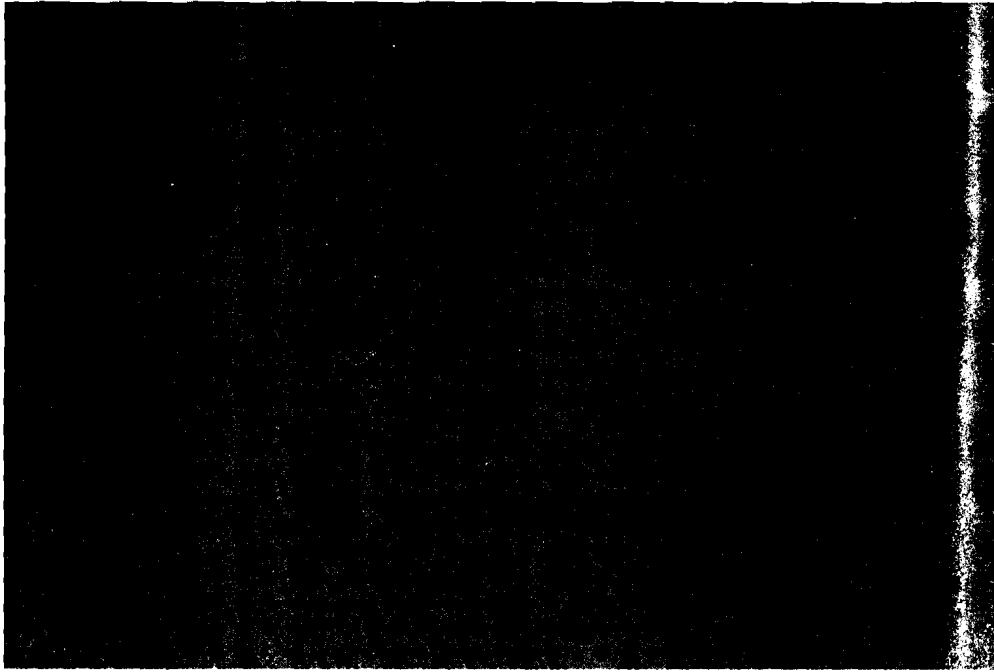


Fig. 4: Cystic hyperplasia of uterine tube in a camel. Multiple cysts are present in the lamina propria (H&E, $\times 40$)

horn. The acquired type is secondary to trauma or chronic inflammation (Kennedy and Miller, 1993; Jones *et al.*, 1997; Acland, 2001). In this study, histopathological examination of the uterine tube with hydrosalpinx showed cystic hyperplasia. In addition to this uterine tube, cystic changes also were seen in the other uterine tube, the ovary and uterus of the camel affected with hydrosalpinx and segmental aplasia. There is no report about simultaneous occurrence of cystic changes in ovary and uterine tubes of domestic animals but Joyner (1994) reported in the cases of cystic hyperplasia of the oviduct in hens, ovary is also involved so that this lesions may be due to an endocrine abnormality (Joyner, 1994). In the case reported here, cystic hyperplasia of the oviduct was associated with luteinized hemorrhagic cyst in the right ovary and also cystic hyperplastic endometritis so that may be due to an endocrine abnormality and this is in agreement with suggestion of Joyner (1994). However, this comment remains to be verified.

In this study, hydrosalpinx was induced due to congenital segmental aplasia of uterine tube. Parkinson (2001) reported secondary infection of hydrosalpinx by *Actinomyces pyogenes* produce pyosalpinx

(Parkinson, 2001).

Salpingitis was identified in 2.08% of the camels studied in present study. Tibary *et al.*, (2001) diagnosed salpingitis in 12 of 366 old world camelids (3.28%). The most common disorders of the uterine tube in Camelidae are inflammations with occlusion or accumulation of fluid in the form of pyosalpinx or hydrosalpinx (Tibary *et al.*, 2001).

In this study, even though the effects of these abnormalities on fertility of camels are not detectable (because the absence of their reproductive history) but most probably they may be a cause of camel infertility. In the present study, for the first time, uterine tube duplication and accessory uterine tubes are reported in dromedary camel.

Acknowledgements

The authors are grateful to the support of Research Council of Shiraz University for providing financial assistance, grant No. 80-VE-1471-2149. Profound gratitude to Mr. L. A. Shirvani and Mr. G. Khatami for their technical assistance.

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