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PATHOLOGICAL AND BACTERIOLOGICAL STUDIES ON MAMMARY GLAND AFFECTIONS IN ONE HUMPED SHE CAMEL 9DROMEDARIES0

By

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SUMMARY

Ninty out of three hundred mammary quarters of seventy five she-camel udders were affected (30%). Eighty eight out of the ninty were recognized as mastitic (97.8%) and as a pre-cancerous in two 2.2%). The former were classified as subacute interstitial mastitis (45.6%), chronic interstitial mastitis (22.2%), haemorrhagic mastitis (17.8%), acute necrotic mastitis (3.3%), chronic granulomatous mastitis (3.3%), acut ulcerative galactphoritis and mastitis (2.2%), acute diffuse fibrinous mastitis (1.1%), suppurative mastitis (1.1%) and mycotic mastitis (1.1%).

INTRODUCTION

Despite of the importance of the mammary gland in she-camel (dromedries) as a source of milk for calves nutrition, milk breeds, meat breeds and milk for human consumption, very few researches were done on the mammary gland affections. In Egypt, studies on that affection were relatively scanty.

Staph. aureus and strept. species were the main primary microorganisms leading to subacute and chronic interstitial mastitis (Heirdrich and Renk, 1967 and Jubb et al., 1985), *Pseudomonas aeroginosa, Staph. aureus* and *E. coli* were considered the main single bacteria causing haemorrhagic mastitis in mammary gland of she-camel (Moustafa et al., 1987). Other investigators recorded that *staph. aureus* was the most bacterial agents isolated from acute ulcerative mastitis in she-camel (Ramadan et al., 1987).

This work was planned to secure the correlation between the histopathological changes and the bacterial isoaltes in the mammary glands of one humped she camel (Dromadries).

MATERIAL AND METHODS

A total of 300 quarters of lactating mammary tissue were grossly examined from 75 slaughtered she-camel at Cairo abbatoir during the peroid from april, 1991 up to August 192.

Double tissue samples were collected from every quarter, the first for bacteriological investigation under aseptic condition according to krieg and Holt (1984), and the second was in 10% formol saline and processed to paraffin sections and stained by haematoxylin and eosin (H & E) (Carleton et al., 1967) and periodic acid Schiff (PAS) according to Pears (1968).

RESULTS

Ninty out of three hundred mammary quarters of seventy five she-camel udders showed different pathological alterations with a ratio of 30 percent. Macroscopically, viscous material was oozed from the cut surface of the mammary tissue. Grey to yellow discolouration with hard consitency were predominent findings in all affected cases.

Histopathological and bacteriological findings:

Eighty eight out of the ninty quarters (97.8%) were nized as mastitic and as a neoplastic in two (2.2 percent). According to the histopathological and bacteriological findings, the mastitic cases could be identified into nine groups.

Group one (41 cases, 45.6%): The stromal mammary tissues showed focal lymphocytic aggregations with nacrophages, plasma cells and neutrophils infitration together with moderate fibroblastic proliferation (Fig.1). *Staph. aureus,* strept. species and *Corynbacteirum ovis* were isoalted.

These changes suggested subacute interstitial mastitis.

Group two (20 cases, 22.2%): Focal lymphocytic aggregations were replaced some of the individual mammary lobules. Leucocytic inflammatory cell infiltration, in association with fibroblastic proliferation, were seen in the stromal tissues (Fig. 2). The lactiferous ducts were cystically dilated in some areas, while the other showed epithelial cell proliferation forming fingerlike projections proturded in the ductual lumenae. Corpora amylacea was detected in a scattered areas. Strept. Species and *Staph. aueus* were the main bacterial isolates.

The previous pathological changes were judged as chronic interstitial mastitis.

Group three (16 cases, 17.8%): In mammary parenchyma and the stroma, many erythrocytes, neutrophils, macrophages and plasma cells were noticed (Fig. 3). *Pseudomonas aeroginosa, staph. aureus* and *E. coli* were isolated.

This picture was identified as haemorrhagic mastitis.

Group four (3 cases, 3.3%): Focal coagulative necrotic area in the mammary parenchyma in asociation with oedema, polymorphnuclear leucocytic inflammatory cells and thrombosis of the blood vessels were observed in also in the connective

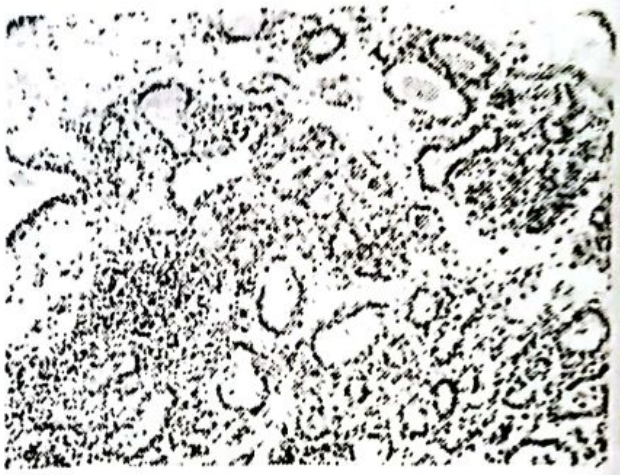

Fig. 1: Mammary gland (M.G.) of she-camel (1st group) showing focal lymphocytic aggregation in association with different inflammatory cells infiltration and fibroblastic proliferation in interstitial connective tissue stroma. H & E stain, x 40.

Fig. 2: M.G. (2nd gp) showing infammatory cell ifniltration and fibroblastic proliferation in the connective tissue stroma. (H & E stain, x 40).

tissue stroma (Fig. 4). Mixed infection of *staph aureus* with *coryn ovis,* Enterococci of *E. coli* were recovered.

The former picture represented acute necrotic mastitis.

Group five (3 cases, 3.3%): Focal circumscribed structureless necrosed area surrounded by epithelloid cells and lymphocytes was noticed in the mammary lobules (Fig. 5). *Pseudomonas aeruginosa* was identified as a single isoalte.

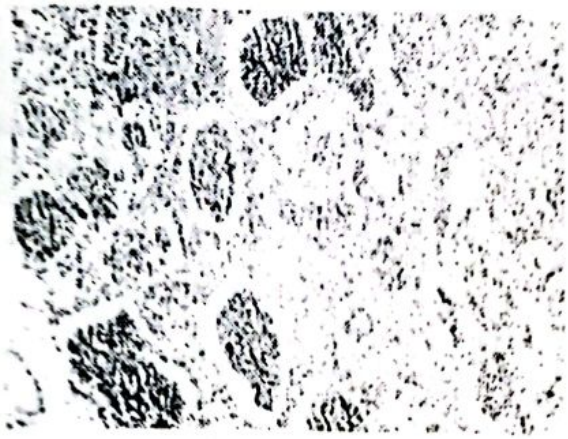

Fig. 3: M.G. (3rd gp) showing massive number of extravasated blood and inflammatory cells in the connective tissue stroma and inflammatory cells in the acinar luminae. (H & E stain, x 40).

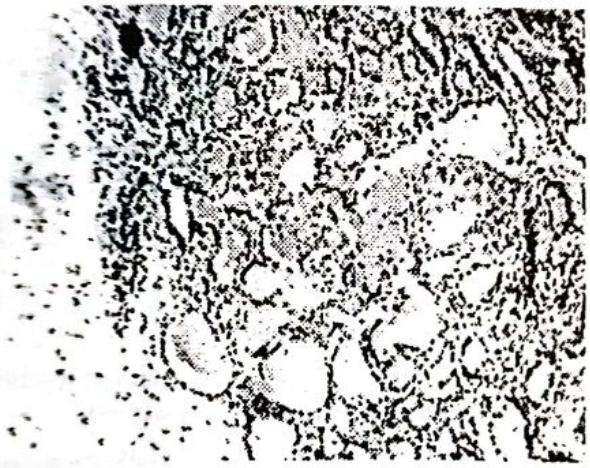

Fig. 4: M.G. (4th gp) showing pyknotic nuclei of the acinar epithelial cells with inflammatory cells with distortion of the lobular pattern. (H & E stain, x 40).

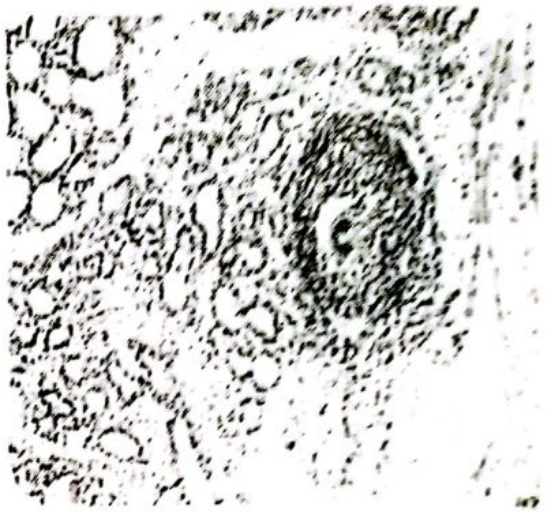

Fig. 5: M.G. (5thgp) showing focal circumscribed structureles necrotic area surrounded by epithelioid cells and lymph ocytes. (H & E stain, x 40).

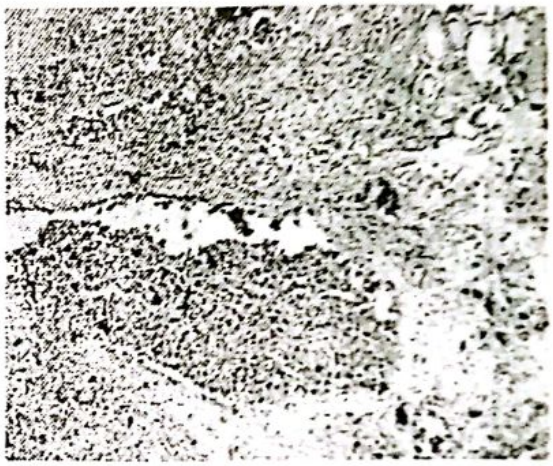

Fig. 6: M.G. (6th gp) showing loss of both acinar basement membrane and epithelium while the duct luminae were impacted

The histopathological picture of the previous cases were identified as chronic granulomatous mastitis.

Group six (2 cases, 2.2%): There was extensive destruction of the basement membrances of both ducts and acini associated with loss of the epithelium. Massive number of different leucocytic inflammatory cells were detected in the stroma (Fig. 6). *Staph. aureus, Coryn. bovis* and micro-cocci were isolated.

This pathological picture was classed as acute ulceratice mastitis and galactophritis.

Group seven (one case, 1.1%); scattered focal areas of liquification with the presence of many polymorphonuclear leucocytes and necrotic cellular debris were seen in the mammary parenchyma (Fig. 7).. Moreover, focal oedematous areas and dilated blood vessels were noticed. Such finding wa noticed in one case (1.1%). *Staph aureus, Coryn. bovis* and micro-cocci were isoaled from it .

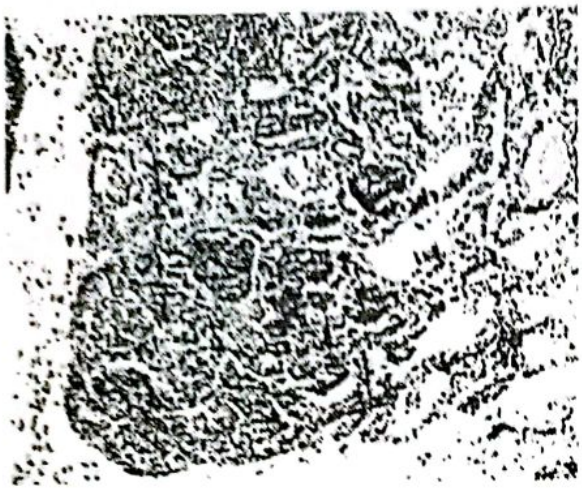

Fig. 7: M.G. (7th gp) showing liquifactive necrosis with the appearance of large number of neutrophils (H & E stain, x 40).

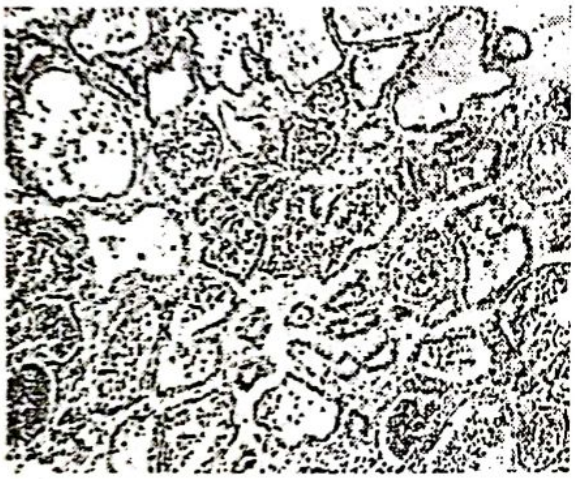

Fig. 8: M.G. (8th gp) showing impaction of the acinar lumen by inflammatory cells and fibrin threads. (H & E stain, x 40).

This group indicated acute suppurative mastitis.

Group eight (one case, 1.1%): The acinar and ductal lumenae were filled by a mash of fibrin threads and different leucocytic inflammatory cells (Fig. 8).

Staph. aureus and *E. coli* were discovered as a mixed isolates. This reaction indicated acute diffuse fibrinous mastitis.

Group nine (one case, 1.1%): Eosinophilic round and PAS positive bodies were observed intra-and extra-cellularly in the mammary tissue (Fig. 9). There was few number of leucocytic inflammatory cell infiltration. No bacterial isolates could be recovered. This picture suggested mycotic mastitis.

Two cases showed proliferation of epithelial cells linging the acini and ducts. Clustering and dysplasia of the acinar epithelium with loss of basement membrane associated with focal lymphocytic aggregation were noticed (Fig. 10).

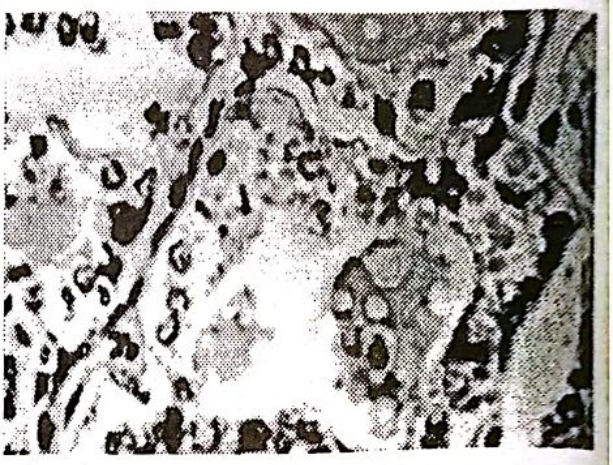

Fig. 9: M.G. (9th gp) showing intra-and extra-cellular PAS positive bodies. (PAS stain, x 40).

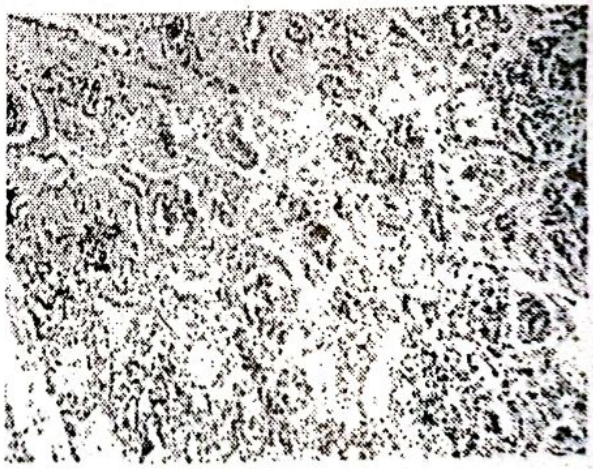

Fig. 10: M.G. (10th gp) showing loss of the basement membrane of the mammary acini with the appearance of clusters of cells in the acinar centre. (H & E stain, x 40).

Strept. species and pasteurella species were iolated from them. The former picture suggested mammary dysplasia and pre-cancerus state of the mammary tissues.

DISCUSSION

In the present study, the inflammatory reactions and the pre-neoplastic changes were the main affections in the mammary glands of she-camel.

The first group of the inflammatory reaction was identified as a subacute interstitial mastitis in 45.6% of the affected cases. It was considered as an intermediate stage between the acute and chronic forms thus the high number of affected cases were recorded in this gorup. This finding agreed with that mentioned by Bolbol (1982) and Ramadan et al. (1987).

The second gorup identified as chronic interstitial mastitis (22.2%) and this form is always a sequallae of various types of mastitis. Strept. species and *staph. aureus* were considered the main primary isolates micro-organisms. Such findings coincides with that reported by Jubb et al. (1985) and Hungerford (1989).

Focal haemorrhagic mastitis (17.8%) was reported in the third gorup, in which focal haemorrhages besides the inflammatory reaction due to *Pseudomonas aeruginosa, Staph. aureus* and isolated in those cases.

Acute focal necrotic mastitis (3.3%) in which *Staph. aureus* was the primary isolated bacteria leading to vascular thrombosis followed by necrosis dur to bacterial exotoxin. his results is in harmony with that mentioned in cattle mastitis by schalm et al., (1971) and Jubb et al. (1985).

Although granulomatous reaction is very rare in camel, the present study revealed chronic granulomatous mastitis (3.3%) in the fifth gorup. The granuloma could not be detected grosslym in contarary to that reported by Schalm et al. (1971) and Jubb et al. (1985) who noticed many granuloma of staph. mastitis grossly and microscopically in the mammary gland of cows.

Acute ulcerative galactophoritis and mastitis (2.2%) identified in the sixth group was accompanied by the isolation of *Staph. aureus* as the only micro-organism present from the affected tissue. That fact was previously recommended by Bolbol (1981) and Moustafa et al. (1987).

Focal liquification of the mammary tissue associated with pus cells and other inflammatory cells were the characteristic suppurative mastitis (1.1%). *Staph. aureus, Coryn. bovis* and micrococci were isoalted. Similar results were also reported by packer (1977).

Acute diffuse fibrinous mastitis (1.1%), in which the severity of the reaction lead to the presence of fibrin in the mammary tissues. The pathogenicity of such condition is depending of *E. coli* endotoxin which increases the vascular permeability, and consequently injury of the vessels wal, in contrary to the direct vaso-constrictor effect of *Staph. aureus* exotoxin. Thus *E. coli* isolated in this gorup was considered as the primary isolated organism, while staph is the secondary bacterial invador.

No bacterial isolate was recovered in the ninth group, however, the histopathological findings revealed intra- and extra-cellular PAS positive bodies associated with mild inflammatory reaction and could be mycotic mastitis (1.1%). This finding was going parallel with the results of Heidrich and renk 91967) in mycotic bovine mastitis.

Neoplastic activity of the mammary parenchyma was recorded in two cases (2.2%) and were identified as adenoma with dysplastic changes. Such finding was not reviewed int he avaliable literatures.

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