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EQUINE FIBROBLASTIC SARCOIDOSIS IN A SIX YEAR –OLD DONKEY- JACK: HISTOPATHOLOGICAL CHANGES: A CASE REPORT

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ABSTRACT

A 6 year- old Jack weighing 140 kg was presented to the Animal Health Unit of a livestock farm with the chief complaint of an out- growth on the shoulder area of the right fore- limb just latero-ventral to the neck. The outgrowth measured 2cm length and 4cm width, tubular in shape and hard on palpation. Tissue biopsy was surgically taken from skin lesion and subjected to histopathological investigation, stained with Haematoxilin and Eosin (H & E) and examined by routine histopathological examination at X 400 magnification. The result revealed fibroblastic sarcoid characterized by complete necrotized epithelial tissues, an area of fibrosis and the infiltration of inflammatory cells consisting mainly of neurtrophils. The condition was promptly treated by surgical excision. Lidocaine® (LidocaineHcl 20mg/ml, epinephrine 0.01mg at dose rate of 2- 50ml) was locally infiltrated around the sarcoid. The skin was sutured using nylon® by simple continuous pattern and followed- up with procaine penicillin (penicillin G procaine 300, 000 i.u with methyl paraben 1.00mg and propyl paraben 0.10mg at dose rate of 6000 i.u per kg of body weight or 1ml/50kgi.m),phenylarthrite®(phenyl butazole 20g,benzyle alcohol 1ml and disodium edentate 0.004g at dose rate of 20- 30ml i.m day 1, 20ml i.m day 2 and 10ml i.m day 3) and flyrepellant; Limoxin- 25 spray®(Oxytetracycline hydrochloride 2mg spray topically one or two times per day).The surgical site healed and the animal returned to normal function.

Key words: Jack, Fibroplastic sarcoid and histopathological changes

INTRODUCTION

The sarcoids are benign tumors of fibroblastic skin origin that are regarded as the most common skin tumor in horses, mules and donkeys which mostly affects young to middle-aged horses of 2-6 years old of all types and breeds where it represent 12% to 67% of all equine tumors and 36% to 70% of all skin tumors in horses (Bergvall, 2013). Sarcoids are locally invasive and may occur in any part of the body either as solitary or multiple lesions, but the most common regions are the head, ventral abdomen and the limbs (Bogaert*et al.*, 2008). They occur at sites of previous injury due to harness, grooming tools or scarring and could be contracted from other affected equids through body contact or fomites but may develop spontaneously where higher tendency of

development might be attributed to hot climate, poor hygiene and insect vector (flies) irritations (Shokry*et al.,* 2015). Although, sarcoids are non -metastatic, they can remain static or become very aggressive locally and can severely compromise the use and value of the animal which may lead to euthanasia (Bergvall, 2013).The sarcoids in donkerys are locally aggressive and non- regressing compared to Bovine Papilloma Virus (BPV) infection in cattle which is known to produce benign lesions that may regress (Sala*et al.,* 2010).

AETIOLOGY

Bovine papilloma virus (BPV1) has been implicated by the finding of a genome that resembles that of the bovine virus in sarcoids (Lohr*et al.,* 2005). Both BPV-1 and BPV-2 have been detected in sarcoid tumours with the BPV-1 being the predominant type (Bogaert *et al.,* 2008). Six BPV types (BPV 1-6) have been characterised to be associated with different histopathological lesions. These are further reclassified into three groups (Bogaert *et al.,* 2007): Xi-papillomaviruses encompassing the pure epitheliotropic BPV-3; BPV-4 and BPV-6; Delta papilloma viruses encompassing BPV-1 and BPV-2 associated to fibropapillomas (benign tumors of both epithelium and underlying derma) and Epsilon-papillomavirus comprising the BPV-5 whose genome seems to share similarities with the formers two BPV groups. Recently BPV was reported as having ability for cross species infection in the water buffalo (*Bulbalusbulbalus*) (Silvestre *etal*. 2009).

Types of sarcoids

Sarcoids are classified in to six distinct clinical forms based on variable microscopic appearance: occult (obscure), nodular, fibroblastic (Proud flesh), verrucous (watery), malevolent (malignant) and mixed (a mixture of the preceding first four types) (Martens *et al.,* 2000 and Knottenbelt, 2005).

Occult sarcoids are characterized by absence of erosions or ulcerations. The epidermis shows variable keretinization from normal, mild or moderate melanine granules in large number (hypermelanosis). The picket fence pattern or cystic hair follicles are not detected. Warty proliferated fibroblasts in the superficial layer are observed with spindle shape elongated hyperchromatic nuclei (Shokry*et al.,* 2015).

Nodular sarcoid are characterized by mild to moderate hyperkeratosis, in epidermis and parakeratosis (thin prickle cell layer proliferation and hypermelanosis in basal cell layer). Neither ulceration of epidermis nor formation of picket fence are observed. Rete pegs are short and few in numbers (Shokry*et al.,* 2015).

Fibroblastic sarcoids are characterized by complete ulceration of epidermis. The superficial dermal layer in some areas shows haemorrhage, calcification, inflammatory cells infiltration mainly of neutrophils, lymphocytes, macrophages and oesinophils with granulation tissue formation. In deeper layers of the dermis, there is proliferation of fibroblasts which are spindle or satellite in shape. The proliferated fibroblasts are arranged in tangles or interlacing bundles running in a wavy pattern, forming a whorl like appearance (Shokry*et al.,* 2015).

Verrucoussarcoids are characterized by moderate hyperkeratosis of the epidermis associated with diffuse or focal hyperplasia of epithelial cells. Large polyhedral cells containing fine granular eosinophilic cytoplasm with ballooning degeneration of mild or moderate degree are seen. The basal cell layer at the basement membrane shows long thin rete pegs of pseudoepitheliomatous hyperplasia descending into the proliferated dermal fibroblasts, destructing the hair follicle, sweat gland and sebaceous gland by collagen bundles and proliferated fibroblasts and few whorls of keratine could be seen. At the dermo-epidermal junction, fibroblasts are arranged perpendicular to the basement membrane forming picket fence

which are characteristic for verrucoussarcoid (Shokry*et al.*, 2015).

Mixed sarcoids are characterized by partial ulceration of epidermis which composed of moderate hypertrophy and hyperkeratosis of the epidermis. These cells are polyhedral in shape, large size containing eosinophilicgranules in cytoplasm and pyknotic nuclei. There is ballooning degeneration. The basal cell layer is proliferated and arranged in more than one layer perpendicular on the basement membrane and few keratin whorls and cystic hair follicles. Other parts of the epidermis send very long thin rete pegs into the dermis with picket fence formation. The ulcerated epidermis shows ulceration with necrosis, haemorrhage, infiltration of inflammatory cells and proliferation of small blood vessels with excess fibrous connective tissues. The dermis showed proliferation of spindle shaped fibroblasts forming whorls (Shokry*et al.*, 2015).

Diagnosis

This can be assessed in three different ways: Clinical examination, biopsy followed by histopathological, and detection of BPV DNA (Sala *et al.*, 2010).

Treatment

The reported treatment methods include: surgical excision (total excisional biopsy), cryosurgery, laser surgery, radiofrequency, hyperthermia, topical cytotoxic and antimitotic drugs, immunotherapy or a combination of all therapies to treat different equine sarcoid forms (Carr, 2009).

Case history and clinical examination

A 6 year- old Jack weighing 140 kg was presented to the Animal Health Unit of a livestock farm with the chief complaint of an out- growth on the shoulder area of the right fore- limb just latero- ventral to the neck. History revealed that, the animal was under semi- extensive management with no housing. However, there was no any history of previous exposure and there was no treatment attempted by the client prior to presentation. On Physical examination, the vital parameters were within their normal ranges while the outgrowth measured 2cm length and 4cm width (Plate I), tubular in shape (Plate II) and hard on palpation. Tissue biopsy was surgically taken from skin lesion and subjected to histopathological investigation by fixing the tissue sample in 10%formlalinefor 24 hours, then dehyderated in ethyl alcohol, cleared in xylol and embedded in paraffin and sectioned into 4-5 micron in thickness stained with Haematoxilin and Eosin (H & E). The sample was examined by routine histopathological examination at X 400 magnification. The investigation revealed fibroblastic sarcoid characterized by complete necrotized epithelial tissues, an area of fibrosis and the infiltration of inflammatory cells consisting mainly of neurtrophils (Plate III).



Plate I: Fibroblastic sarcoid (2cm length and 4cm width) on the shoulder aspect of the right fore-limb just latero- ventral to the neck of Jack from a livestock farm.



Plate II: A shaved site of the tubular Fibroblastic sarcoid(prepared for excision)on a Jack from a livestock farm.

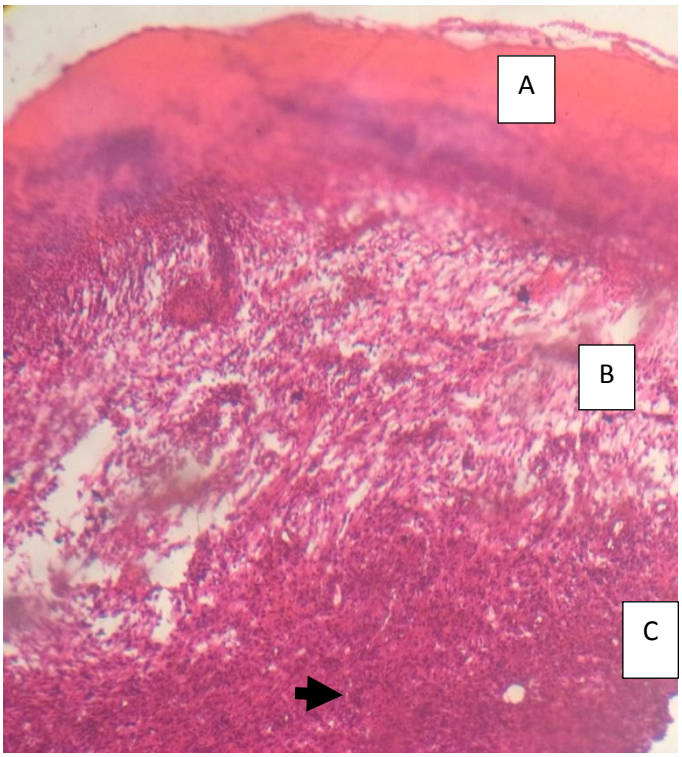


Plate III: Histopathological changes charecterised by Necrotised epithelial tissues with presence of fibrocytes at the mucosa and infiltration of neutrophils at the submucosa.Note (A) The necrotized epithelial tissues, (B) An area of fibrosis and (C) The infiltration of inflammatory cells (Neutrophils). H and E Stain. X 400.



Plate IV: The clear healed site following succesfull excision of the sarcoid on a Jack from a livestock farm.

Treatment

The sarcoid was subjected to treatment by surgical excision. An aseptic preparation of the affected site was done followed by shaving. Lidocaine® (LidocaineHcl 20mg/ml, epinephrine 0.01mg at dose rate of 2- 50ml) was locally infiltrated as local anaesthesia. The skin was sutured using nylon® by simple continuous pattern and followed- up with procaine penicillin (penicillin G procaine 300, 000 i.u with methyl paraben 1.00mg and propyl paraben 0.10mg at dose rate of 6000 i.u per kg of body weight or 1ml/50kg i.m), phenylarthrite® (phenyl butazole 20g,benzyle alcohol 1ml and disodium edentate 0.004g at dose rate of 20- 30ml i.m day 1, 20ml i.m day 2 and 10ml i.m day 3) and fly repellant; Limoxin- 25 spray® (Oxytetracycline hydrochloride 2mg spray topically one or two times per day). Daily monitoring of the surgical site was performed for 4- weeks until the area was completely healed (PlateIV) and the animal returned to its normal function.

DISCUSSION

Equine sarcoid is a common occurance in donkey and the findings of this report agreed with the finding of Shokry *et al.,* (2015) who reported sarcoid as the most common cutaneous tumors in equids in Egypt where it was reported to affect all age groups. Although other studies found an incidence peak between 3 and 6 years of age (Torrontegui and Reid, 1994; Knottenbelt, 2005). However, gradual increase in incidence is observed up to the age of 15 years followed by a decrease in prevalence (Mohamed *et al.,* 1992). Other researchers have reported a higher prevalence in younger animals (Carstajen*et al.,* 1997; Clottu, 2008).

The occurance of equine sarcoid could be attributed to combined grazing with cattle which is agreed with the finding of Shokry*et al.,* (2015) who observed that many of the presented patients were cohabited in places with animals of bovine species and this seems to confirm the intimate relation between the bovine papilloma virus (BPV-DNA)and the pathogenesis of equine sarcoids.

The fibroblastic type of sarcoid encountered in this case agreed with the finding of Shokry*et al.,*(2015) who reported fibroblastic sarcoidas the most dominant type in horses and donkes as he reported from Egypt as (36.5%) followed by the mixed type (28.9%). The nodular, verrucous and occult type were also recorded in proportions (17.6%, 12.6% and 4.4%) respectively byShokry*et al.,*(2015) which could be attributed to the fact that sarcoids develop initially as benign and small of other types, then transform into severe and aggressive fibroblastic form.

The possible explanation for the occurrence of sarcoid on legs as found in this case report could be due to the fact that, legs are more exposed to different kinds of injuries. This is in line with the finding of Shokry*et al.,* (2015) who reported localization pattern of sarcoidsas the limbs (40.9%), the paragenital and anal regions (22.0%), the periorbital (15.7%), the neck (11.3%) and other body areas (10.1%). These findings are consistent with those mentioned by Martens *et al*., (2001) and Clottu, (2008). Other authors; Brostrom, (1995) and Martens *et al.,* (2001) reported the trunk and head area as predominantly affected rather than the extremities.

CONCLUSION

Equine sarcoidsare major global challenges to donkey production causing great economic losses to farmers due to hide damage, cost of treatment and possible mortality.

RECOMMENDATIONS

Equids should not be sharing grazing lands with bovine species of animals. There is need for effective fly control in areas where equids are living. Early treatment is recommended to prevent expansions. Minor skin injury should be also early attended to. Appropriate treatment options should be selected according to the location, size and type of sarcoid for getting good results.

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