CASE REPORT

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Management of squamous cell carcinoma on the thigh of a Nigerian Albino horse

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Abstract

The albino horse is the choice horse traditionally for ceremonial parade amongst the military and the police force in Nigeria because of their bright and attractive appearance on parade ground. Incidentally, squamous cell carcinoma (SCC) is the most common neoplasia of the skin in horses especially the albinos. An 8-year old albino parade stallion of Nigerian breed was presented with the chief complaint of growths on skin of right thigh and a tentative diagnosis of SCC was made. This case reports a successful management of SCC in albino horses with a view to improving management of the condition especially in veterinary settings with limited facility. The horse was restrained in standing position using hobbles and xylazine sedation. Local anaesthesia was achieved using Lidocaine hydrochloride. Growths were debulked in two surgeries, conducted 60 days apart. Vincristine 2 mg was administered intravenously twice at 3 weeks apart after each surgery but additionally, 1g was infiltrated at site after the second surgery, necessitated by re-growth of lesion. Wound was regularly cleaned and dressed. Blood and tissue samples were collected and analyzed for haematological and histopathological alterations respectively. Pre-treatment, haemogram showed neutropenia, lymphocytosis and hyperproteinemia. Histopathological examination revealed focal areas of keratin pearls**,** massive undifferentiated tumour cells at different stages of mitosis. It was concluded that surgical excision of lesions and vincristine therapy should be used in squamous cell carcinoma management in horses. Therefore, it was recommended that surgeons should be patient as multiple surgeries may be indicated depending on severity of squamous cell carcinoma.

Keywords: Albino, Carcinoma, Horse, Management, Nigerian, Squamous Cell, Thigh

Introduction

Traditionally, albino horse is the choice for ceremonial parade amongst the military and the police force in Nigeria because of their bright and attractive colour on parade ground, thereby, beautifying parade. Squamous cell carcinoma (SCC), a neoplasia of squamous epithelial cells, which affects the limbus, conjunctiva and eyelid in horses and cattle (Dreyfus *et al*., 2011) and appears as thickened area of skin, rough surfaced, pinkish to red in colour and ulcerated especially in older animals (Conceicao *et al*., 2010). The predisposing factors to SCC include age, decreased skin pigmentation, light colored coats and increased exposure to ultraviolet (UV) light (Clode *et al.,* 2018). The differential diagnosis for SCC in horses includes; sarcoid, melanoma, papilloma and lymphoma. The treatment options available include; ablative (surgery and laser vapourisation), cytotoxic (radiotherapy and chemotherapy) and biological

(immunotherapy) methods. The prevention and control measures advised in practice include; avoidance of chronic exposure to UV light especially in tropical areas when animal is at rest, regular examination of aged and albino horses for early detection of SCC lesion (Barbara, 2008). The authors' experience showed that use of creams considered not harsh on skin such as petroleum jelly (Vasline Blueseal®, Unilever, Nigeria) for treatment of facial burns in albino horses after every prolonged exposure to sunlight as in military parade rehearsals, helps in reducing effect of UV light on light-skinned areas of the horse's body. Success of treatment depends upon the anatomical location of lesion, spread and early detection of tumour (Clode *et al.,* 2018). The essence of reporting this case is to bring to the knowledge of practitioners and horse owners, the health challenge posed by SCC in horses in Nigeria so that appropriate treatment measures can be instituted to save the lives of the vulnerable horses especially the albinos.

Case Management

Case history

An albino stallion of Nigerian indigenous (*Arewa*) breed used for military ceremonial parade was presented to the Veterinary Clinic, Nigerian Defence Academy, Kaduna with the chief complaint of two growths observed on the posterior aspect of the right thigh. The horse weighed 311.5kg on digital scale (Model: PS3000, Breaknell, China). The age was estimated to be 8 years based on absence of well defined (worn out) dental star on the lower (central, lateral and corner) incisors of the permanent set of teeth (Wayne & Melvin, 2000). The growths increased in size despite treatments and dressing using Oxytetracycline-gentian violet spray before presentation.

Clinical examination revealed growths of about 2.5 cm base-widths and 1.5cm length each. There was alopecia, rough contour of lesion, painful to touch and involved skin and subcutaneous tissue on palpation. The resting value of respiratory rate was 12 (normal=8-12) cyrcle/minute, pulse rate 33 (normal=24-40) beats/minute and rectal temperature of 38.3^0C (normal=37.5-38.6^0C) (Wood, 2013). Body condition score of the stallion was 6 (moderately fleshy) of the Nine Points Scale of KER (2011).

Management

The horse was in a herd of 53 horses housed in a stable with full capacity of 100. The stable blocks have sufficient drainage, terrazzo-floored loose boxes measuring 12x12ft and the ventilation vents and doors were fitted with fly-proof nets. Wood-shavings was used as bedding material and changed as soon as it got soiled. The stable was cleaned daily.

The routine feeding, comprised of bailed *Chloris sp* hay, water and salt lick provided *ad libitum*. Whole grains mixture in equal quantities of sorghum/millet totaling 1.1kg, wheat bran (0.75 kg)/ maize bran (1kg) mixture and concentrate feed supplement (groundnut cake, vitamins, fat and oil) of about 28.5g were served per animal per day in two divided rations for morning (10.00am) and evening (5.00pm). This feeding regimen was maintained during the period of nursing care.

Jugular vein blood (5ml) anticoagulated with Ethylene diamine tetra-acetic acid and excised growth preserved in 10% formaldehyde were used for haemogram analysis and histopathology respectively. Samples were analyzed in the Department of Veterinary Pathology, Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria.

The horse was restrained using hobble applied to the right-side forelimb and hindlimb (affected side) with the animal held in standing position by a groom (assistant) familiar to the horse. About 1cm skin was shaved from base of the growth and around it. The area was swabbed with methylated spirit. The sedative used was Xylazine Hcl 2% (Xylased®, Biovets, Czech Republic) administered intravenously (IV). Local anaesthesia was achieved with lidocaine-adrenaline 2%, using 5mL infiltrated around each of the growths. With the animal in standing position, elliptical incision was made around each of the growths. The skin and subcutaneous tissues, including discoloured portions, were removed. Single, simple interrupted stitch was applied to the lower, larger, surgical wound using Nylon size 1 to reduce wound size. This first surgery was followed up using Vincristine (Paucocristine®, Pauco Pharma Ltd, Nigeria) 2mg administered IV and repeated 3 weeks later. Re-growth of lesion was observed and by day 60 post-surgical, a second surgery was conducted (Plate IA,B,C). This was followed up again using Vincristine 2mg for IV injection and 1mg for local infiltration at site (total= 3mg) twice at 3 weeks apart. After each surgery, post-surgical care included daily wound cleaning with diluted chlorhexidine for the first 3 days and dressing with oxytetracycline spray (Oxypharma®, Chengshengtang Anim. Pharm. Co. Ltd, China), twice daily (morning and afternoon) when fly activity was high. Subsequently, wound cleaning was reduced to once

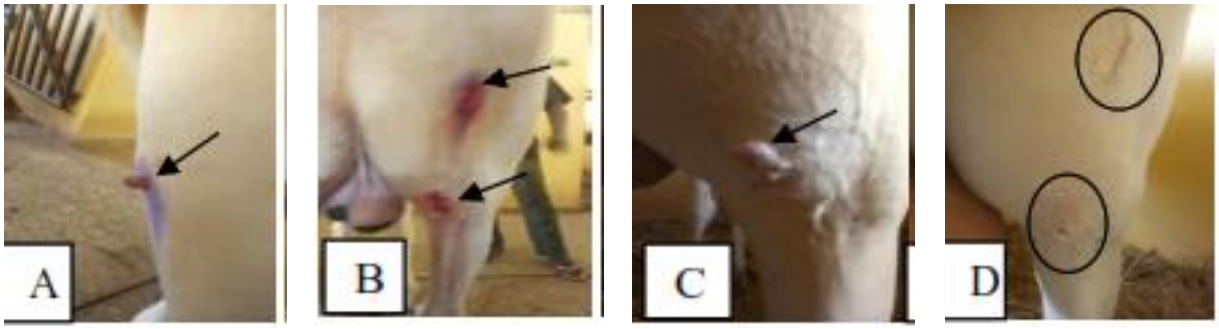

Plate I: Arrowed are; the lower (bigger) growth on posterior aspect of thigh (A), wound after first surgery (B), re-growth of lower thigh-lesion at 60 days after first surgery (C) and healed surgical sites at day 180 after second surgery/treatment (circled in D)

in 2 days until wound closure was achieved (plate ID).

Results and Discussion

The gross features of the lesion in this case study coupled with its location on the skin are in line with earlier description of squamous cell carcinomas (SCC) by Dreyfus *et al*. (2011). This strongly suggested our tentative diagnosis of SCC.

The haematological parameters observed pre-surgical/chemotherapy showed presence of neutropenia, lymphocytosis and hyperproteinemia in this case report. These suggest chronic disorder with elevated total protein that is predominantly due to immune complexes build up during host immune response to cancer cells proliferation (Sow *et al.,* 2014). However, after first surgical intervention, the horse showed normal blood picture but hyperproteinaemia persisted. Again, this finding suggests the incomplete cure of the SCC because of non-application of chemotherapy in the first

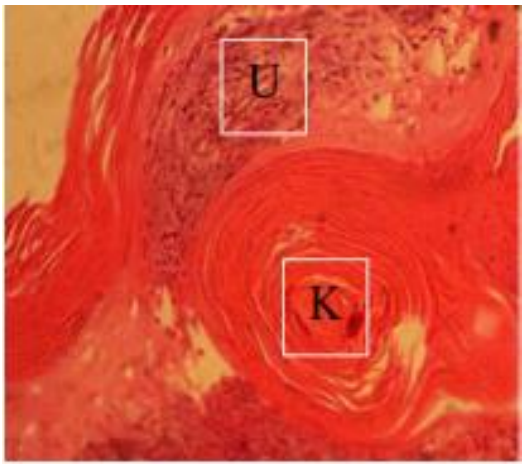

Plate II: Focal areas of keratin pearls surrounded by a concentric aggregation of cornified squamous epithelial cells, horn pearl (K)**.** Undifferentiated tumour cells at different stages of mitosis and inflammatory cells(U). H-E Stain, X400

treatment regimen but showed reduced severity of the disease. This is supported by the accumulation of immune complexes as shown by persistence of hyperproteinaemia (Table 1). In the present case, the histopathological features observed were focal areas of keratin (keratin pearls), concentric aggregation of cornified squamous epithelial cells (horn pearl), massive undifferentiated tumour cells at different stages of mitosis (anisocytosis and anisokaryosis) and presence of inflammatory cells (Plate II). These are typical findings in metastatic tumour of squamous cells in horses as described for preputial sheath SCC case in mixed breed dog by Manesh *et al*. (2014). This, therefore, confirms the diagnosis of SCC. The first surgical excision of growth alone, conducted on the animal did not result in cure of the ailment and instead, re-growth of the lesion occurred. Conceicao *et al*. (2010) reported that SCC is treatable successfully using a combination of surgical excision of growth and chemotherapy. The re-growth of lesion after first surgery in this case might largely be due to absence of chemotherapy. This point is buttressed by the fact that following a second surgery that is accompanied with a course of Vincristine treatment, the animal did not show re-growth of lesion and hence cured. Also delay in presentation time of any SCC case can also make success of treatment more difficult as earlier reported by Clode *et al.* (2018).

It was concluded that surgical excision of growth does not result in cure of SCC in albino horse. However, a combination of surgical excision of lesions and vincristine therapy administered by local infiltration and intravenous injection twice at 3 weeks apart only or more doses given at similar intervals, depending on severity of SCC is an effective cure regimen in management of SCC in albino horses.

It is recommended that in managing SCC, growth should be surgically removed and accompanied with chemotherapy. It was recommended that surgeons

Table 1: Pre and post-treatment of haematological parameter of horse with Squamous cell carcinoma

Haematological parameters	Normal Reference Range*	Observed Values	
		1 day before first surgery/treatment	240 days after first surgery/treatment
Haemoglobin (g/dL)	10.1-16.1	10.6	14.0
Packed cell volume (%)	27-43	32	42
White blood cells ($x10^9$/L)	5.6-12.1	8.6	8.8
Bands (%)	0-1	05	00
Neutrophils (%)	52-70	28	68
Lymphocytes (%)	21-42	64	30
Monocytes (%)	0-6	03	02
Eosinophils (%)	0-7	00	00
Basophils (%)	0-2	00	00
Total protein (g/dL)	6.0-8.5	10.4	10.8

* For horses, as reported by Susan (2018) in *MSD Veterinary Manual*, online version

should be patient as multiple surgeries may be indicated depending on severity of squamous cell carcinoma.

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Conflicts of Interest

The authors declare no conflicts of interest.

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