

## MOLLUSCUM CONTAGIOSUM IN A HORSE

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### ABSTRACT

An adult stallion presented with a severe papular dermatitis of especially the neck, chest and genitalia. A marked scrotal oedema was present. Histopathological examination of skin biopsies, revealed the presence of numerous intracytoplasmic molluscum bodies in areas of focal epidermal hyperplasia. Electron microscopical examination showed the presence of typical pox virions in affected epidermal cells. Attempts at viral isolation were unsuccessful. This is believed to be the first reported case of molluscum contagiosum in a horse in the Republic of South Africa.

**Key words:** Pox virus, horse pox, molluscum contagiosum, Uasin Gishu disease, equine.

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### INTRODUCTION

Molluscum contagiosum is a benign, mildly contagious poxviral dermatitis in man. A similar condition has been described in chimpanzees<sup>2</sup>, kangaroos<sup>9</sup>, South American sea lions<sup>13</sup> and horses<sup>1 8 10 11</sup>. In Africa, the disease has been reported in Zaire<sup>10</sup> and Zambia<sup>8</sup>, while a form of horsepox known as Uasin Gishu disease has been reported from Kenya<sup>4 5 6 7</sup>. To the best of our knowledge the disease has not been reported as yet in the Republic of South Africa, although cases may have been observed but not recognised.

The disease is characterised by small raised papules that may occur anywhere on the body, but seem to occur more frequently on the skin of the face, neck, chest (trunk), inguinal region and, in males, the genitalia. The papules vary in size from 2 to 8 mm in diameter, are hypopigmented and covered by tufts of raised hair<sup>1 10 11</sup>. If detached, they leave small craters which may bleed. The microscopical picture characteristically consists of a focal, abrupt proliferation of

keratinocytes with numerous large intracytoplasmic inclusions known as molluscum bodies, which ultra-structurally consist of numerous pox virions.

### CASE HISTORY

An adult Boerperd stallion from the Hammanskraal district, Transvaal, was presented to the Department of Medicine, Faculty of Veterinary Science, University of Pretoria, showing a widespread papular dermatitis of 2-months duration. In addition, a severe scrotal oedema was evident. The horse had been kept on natural grazing, which it had shared with several other horses. It was the only affected animal on the premises.

Clinical examination of the horse revealed numerous non-pruritic grey-white papules, covered by raised tufts of hair and varying in diameter from 2 to 8 mm on the ventral neck and thorax, proximal limbs, ears, muzzle, scrotum and prepuce. The superficial layers of the papules were dry and flaky. Papules could easily be detached by manual manipulation, leaving small non-haemorrhagic craters. No vesicles or pustules were observed and there was no involvement of the mucous membranes. Although thin, the stallion was otherwise in good health.

Haematological examination showed a leukocytosis, neutrophilia with a left shift



Fig. 1: Widespread papular dermatitis particularly noticeable on the ventral neck



Fig. 2: Close-up view of the neck lesion

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and eosinophilia. Aspiration of the scrotal oedema yielded a straw-coloured exudate, containing large numbers of neutrophils and eosinophils. Dourine was excluded serologically. Skin scrapings were negative for parasites and skin cultures were negative for bacterial and fungal pathogens.

Punch biopsies of the papules were fixed in 10% buffered formalin and in 4% glutaraldehyde for light- and electron-microscopical examination respectively. These tissues were processed in a routine manner. Sections for light microscopy were stained with haematoxylin and eosin and the Feulgen reaction for DNA according to standard procedures.

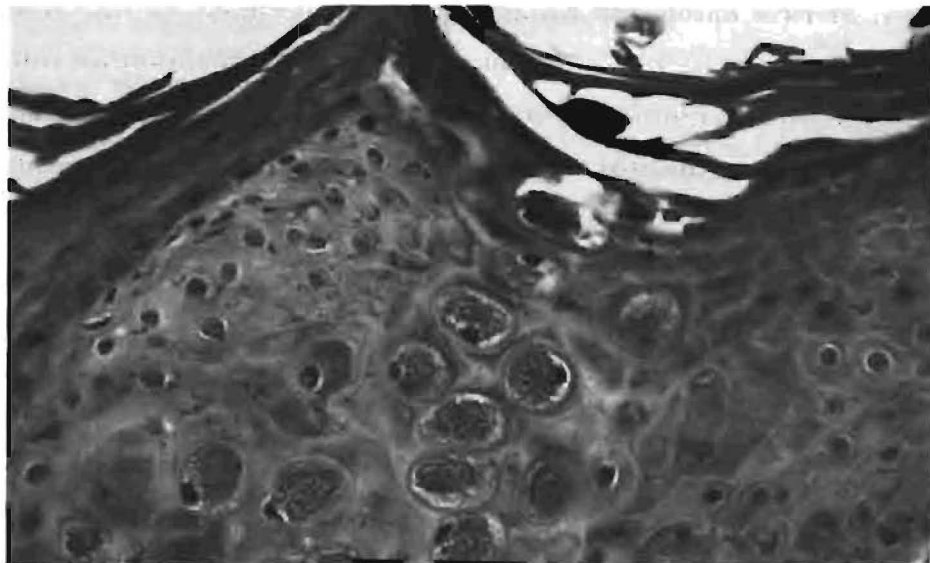
Ultra-thin sections were stained with 1% uranyl acetate and 0.2% lead citrate for electronmicroscopical examination. In addition, a number of papules were manually removed from the skin for further investigation. Some were homogenised and adsorbed onto 400 mesh grids before being negatively stained with 3% phosphotungstic acid and examined electronmicroscopically.

A 10% suspension of papule material was prepared in a neutral buffer and clarified by centrifugation at 2 000 rpm for 20 min. The resulting supernatant was used to inoculate primary and low passage calf-kidney cell cultures. Infected and control cultures were maintained at 37°C and observed daily for a cytopathic effect.



**Fig. 3: Focal hyperplasia of stratum spinosum with molluscum bodies in the majority of the keratinocytes. Note release of cells containing molluscum bodies from the epidermal surface. HE X 100**

Histopathological examination of skin biopsies revealed sharply demarcated areas of papillomatous hyperplasia of the stratum spinosum of the epidermis, which projected above the surrounding normal epidermis and extended somewhat below the basement membrane into the dermis (Fig. 3). Many of the keratinocytes contained large molluscum bodies, which, in many instances, compressed the somewhat pyknotic epidermal nuclei to one side of the cell (Fig. 4). These bodies stained mildly basophilic in the suprabasilar layers and became larger, more basophilic and granular in the outermost layers. They stained positively for DNA with the Feulgen reaction. In some biopsies the cells containing molluscum bodies were being discharged from the surface (Fig. 3). The dermal reaction was mild and consisted of focal infiltrations of a few lymphocytes and plasma cells.



**Fig. 4: Large molluscum bodies in epidermal cells compressing the nuclei. HE X 400**

Isolation attempts on tissue culture were unsuccessful.

Ultrastructural examination of sections, as well as the negatively-stained material, revealed the presence of numerous viral particles, which conformed to the characteristics of pox viruses. In sections, the virions were mostly oval to rectangular and consisted of a biconcave, dumbbell-shaped electron-dense nucleoid and two less electron-dense lateral bodies (Fig. 5). Negatively-stained particles showed C (capsule) and M (mulberry) forms with the irregular arrangement of surface fibrils and the serrated outline clearly visible in the M forms. The particles measured 239,66 x 178,53 nm (mean of 20 particles measured).

## DISCUSSION

Poxvirus infection is rare in horses. Classical horsepox allegedly occurs only in Europe, is highly contagious and is characterised by the development of papules progressing to vesicles and pustules on the skin in the "greasy heel type" (contagious pustular dermatitis) or on the face, nares, oral and nasal mucous membranes in the "buccal type" (contagious pustular stomatitis)<sup>3, 12</sup>. The latter was recently reported in a donkey from a zoo in Kansas, USA<sup>3</sup>.

Viral papular dermatitis, which may be a variant of horsepox, is described as a highly contagious disease of horses in the United States and New Zealand<sup>4, 12</sup>. The disease is characterised by a papular reaction only. The causative virus has not yet been characterised and the histopathology not described. The cause of Kenyan horsepox, also known as Uasin Gishu skin disease, has been isolated and cha-

acterised<sup>4, 5, 6</sup> and is related to the vaccinia group of pox viruses.

Equine molluscum contagiosum on the other hand is only mildly contagious, if at all, and although lesions may appear anywhere on the skin, they are apparently more common on the face, neck, chest and trunk, innerlegs and on the genitalia. The similarities in the clinical appearance, protracted course of the disease and identical morphological characteristics of the causative virus, have prompted some authors to regard Uasin Gishu skin disease and molluscum contagiosum as the same disease<sup>8, 10</sup>. However, the relative ease with which the virus causing Uasin Gishu skin disease can be grown on primary calf-kidney cultures<sup>5</sup> and the inability



Fig. 5: Pox virion showing the rectangular shape and biconcave electron-dense nucleoid. Electron micrograph Bar 50 nm

ty to isolate the virus of molluscum contagiosum on such cultures, suggest that the 2 conditions are caused by related, but different viruses.

In humans molluscum contagiosum is a contagious skin disease with a worldwide distribution. It is characterised by single or multiple cutaneous nodules, 2-5 mm in diameter anywhere on the body. The clinical course of the condition, extends over weeks to several months. The histopathology is characterised by focal epidermal hyperplasia and the presence of large eosinophilic intracytoplasmic inclusions located in a cytoplasmic cavity<sup>10 11</sup>. (Routine haematoxylin and eosin staining techniques used in our laboratory, stained the inclusions mildly basophilic.) The virus has not yet been isolated and therefore remains unclassified.

Similar conditions have been described in several animal species including chimpanzees<sup>2</sup>, kangaroos<sup>9</sup>, sea lions<sup>13</sup> and equines<sup>1 8 10 11</sup>, and probably represent accidental infections in debilitated or immune-compromised hosts. The disease

under these circumstances is not regarded as being contagious.

The Kenyan horsepox may have originated as a spill-over into the horse population from the small pox eradication vaccination programme, with conceivable adaptation of the virus to its new host. Since small-pox vaccination ceased in 1980 when the disease was eradicated, any pox in equines in the Republic of South Africa would have to have been imported into the country as there is no naturally-circulating vaccinia virus. As molluscum contagiosum occurs naturally in the human population, it seems possible that the horse described in this paper may have picked up the virus from a human carrier.

Although this is the first description of equine molluscum contagiosum in the Republic of South Africa, an apparently identical clinical syndrome was observed previously (B J Erasmus 1990 Veterinary Research Institute, Onderstepoort and S R van Amstel 1990 Faculty of Veterinary Science, University of Pretoria, personal communication). According to Erasmus, the scrotal oedema, which was very pronounced in the case reported in this paper, is a common finding in affected stallions. He also states that the assumed identical condition seen by him, could be transmitted to other horses by the intravenous injection of blood or saline suspensions of skin material from infected cases (which were not confirmed to be molluscum contagiosum). No transmission studies were attempted with material from the case reported in this paper. Normally, the disease has a prolonged course and spontaneous recovery may take place after several months. According to Erasmus, the administration of corticosteroids results in a flare-up of the condition in such animals. This strongly supports the view of other authors that the disease is predisposed to by immune-incompetence and debilitation<sup>1</sup>. The stallion reported in this paper arrived in an emaciated condition and improved during hospitalisation on a proper diet without any other specific treatment. Unfortunately, contact with the owner has been lost since the discharge of the patient and the present condition of the horse is unknown.

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