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Pathological evaluation of unilateral seminoma in a marwari stallion: A case report

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Abstract

Testicular neoplasia is rare in equines and more commonly seen in canine and feline group, testicular neoplasia arises from germ cells and sex-cord stromal elements of the testis. One such condition was seen in a six-year-old Marwari breeding stallion presented with a progressive scrotal swelling over 2-3 months. On palpation the testicle was hard and slightly tender. For confirmation of other conditions ultrasound examination was done to rule out inguinal hernia, hydrocele, abscess and haematoma around inguinal region. Unilateral orchidectomy was done on owners request to preserve the breeding status of stallion. Xylazine and butorphanol was administered as premedication for sedation followed by diazepam and ketamine and triple drip; 5% Guaifenesin + Xylazine (0.5 mg per ml + ketamine 1 mg per ml) used for induction and general anaesthesia, respectively. Grossly the testicle was multinodular with a grey-white surface and microscopic observation revealed the testicular tissue had diffuse proliferation of very large, polyhedral cells having sharp borders, vesicular nuclei and prominent nucleoli.

Keywords: Marwari, orchidectomy, polyhedral cells, scrotal, vesicular nuclei

Introduction

Neoplasms of stallions are essentially limited to those of the testes, the penis and prepuce. Testicular neoplasia is rare in equines and more commonly seen in canine and feline group, testicular neoplasia arises from germ cells and sex-cord stromal elements of the testis. Due to early castration practice followed actual incidence of equine testicular neoplasia is difficult to determine. The most commonly reported testicular tumour in equines is "seminoma". Seminomas arise from the germ cells of the testicular spermatogenic epithelium commonly seen in adult or older animals, retained testicles and are considered benign. They also may be single, multiple, unilateral, bilateral, or cystic [2, 6, 12].

Seminomas are soft and grey or light brown. Though they occur in descended testes, seminomas are seen more frequently in cryptorchid testes [4]. On the basis of histological characteristics, the testicular tumours are classified into intra-tubular and diffuse type [1]. Seminomas rarely lead to paraneoplastic syndrome exhibited by alopecia, hyperpigmentation, prostatic squamous metaplasia, diabetes mellitus [7], and bone marrow aplasia due to presence of hyperestrogenism [11]. Clinically the seminomas are characterised by anorexia, lethargy, hyperthermia, vomiting, abdominal and local pain, dysuria, marching dysfunction [8].

Materials and Methods

Case History

A Six-year-old Marwari breeding stallion was presented with a progressive scrotal swelling over 2-3 months (Fig. 1).

Clinical Examination and Diagnosis

On palpation the testicle was hard and slightly tender. Ultrasound examination was used as screening modality for inguinal hernia, hydrocele, abscess and haematoma around inguinal region.

Treatment

Unilateral orchidectomy was decided to be done on owners request to preserve the breeding status of stallion.

Surgical Protocol followed

Following premedication with xylazine and butorphanol the horse was positioned in lateral recumbency with its upper rear limb hauled forward and secured with a rope. For induction of anaesthesia diazepam and ketamine was used and triple drip; 5% Guaifenesin + Xylazine (0.5 mg per ml + ketamine 1 mg per ml) for maintenance of general anaesthesia. Whole scrotal area was aseptically prepared; the scrotum was anesthetized by subcutaneous direct infiltration along the lines of planned incision, using 10 ml of a 2 % Lidocaine solution into spermatic cord. Testicle was compressed against the bottom of the scrotum and 10-cm-long incisions was placed 2 cm on side of the raphe along the line of local anaesthetic from cranial to caudal poles of the testicle. After incising of tunica vaginalis, the ligament of the tail of the epididymis, mesorchium, and mesofuniculum were bluntly transected followed by the exteriorization of testicle, epididymis, and distal portion of the spermatic cord was done. Transfixing ligatures were placed 1 cm apart, as far proximally as possible, on the testicular vasculature and ductus deferens by vicryl suture; Vicryl: 1-0 (Johnson and Johnson). The spermatic cord was crushed for 5 minutes to achieve haemostasis and then removed by using a Reimer emasculator (crushing component was proximal to the cutting blade). And the scrotal incision was left unsutured for healing by secondary intention. Testicle specimen was submitted for pathological study.

For the post-operative medication Penicillin G Sodium I.P. (5,00,000 units), Flunixin meglumine @ 2.2 mg/kg was administered for five and three days respectively and tetanus toxoid was administered soon after the surgery. Excision of the testicle was conducted to reveal the gross abnormalities developed and then tissue sample was fixed in phosphate-buffered formalin (3.5%) for histological examination.



Fig 1: Swelling around scrotum

Results and Discussion

Haemato-biochemical evaluation revealed no abnormal findings and the stallion recovered uneventfully from surgery and completed a successful breeding season, beginning 4 months following surgery, with fair fertility rate. Grossly the left testicle was enlarged measuring 24 x 15 cm, the testicular venous channels were distended with blood, multifocal acute interstitial haemorrhages were present and grossly the testicle

was multinodular with a grey-white surface as depicted in Fig. 2 and Fig. 3, respectively. Histological examination of the tissue sample was done using Hematoxylin and Eosin staining method, suggestive of Seminoma - Diffuse form (Malignant Tumor). Microscopic observation revealed the testicular tissue had diffuse proliferation of very large, polyhedral cells having sharp borders, vesicular nuclei and prominent nucleoli. The cells were having “blastic” appearance and scant basophilic or amphophilic cytoplasm as shown in Fig. 4. The cells were not confined to tubules and arranged as sheets separated by fibrous tissue. Necrosis of individual cells was seen and there were focal areas of lymphocytic infiltration. Mitotic figures were numerous and infiltration of the tumor cells into tissue tunica albuginea was seen.

Seminomas may be unilateral or bilateral, solitary or multiple, and they are more common in the right testicle than the left [1]. Seminomas develop from cells of the spermatogenic series, probably from basal spermatogonia, associated with multiple foci of origin in the affected testis [9]. Proliferation of tumor cells leads to destruction of the seminiferous tubular wall and the development of a diffuse neoplasm [2]. The time that testicular enlargement is detected, neoplastic tissue often occupies most of the testicular parenchyma furthermore seminomas are seen in the older animals and are more commonly seen in the cryptorchid testes of dogs. Equine seminomas seem to be more critical than those of other domestic species as the metastasis is more likely in affected horses [2, 13]. There is no connotation of cryptorchidism and seminoma occurrence proven in the equines [3]. However, seminoma has been mainly reported in the cryptorchid animals [1].

The macroscopic and microscopic findings of the seminoma were analogous to the results of previous studies and seminomas are characterised as benign or malignant on the basis of the pleomorphic changes, mitotic activity and metastatic features [6]. In the present study the pleomorphic change was identified by the high mitotic activity. It has been seen in mammals that there is frequent spread of metastatic features to the regional lymph nodes; however, extensive dissemination can also occur to internal organs [1]. In addition to this, the infiltration of tumor cells into vessels or tissues adjacent to the testicle, such as the tunica albuginea, epididymis, or spermatic cord is indication of malignancy [1]. Radiotherapy and chemotherapy are only therapeutic protocol for the malignant seminoma cases with metastasis, and for the cases without metastasis castration is preferred [10].



Fig 2: Gross distension of testicular venous channel and multifocal haemorrhages



Fig 3: Multinodular with a grey-white surface

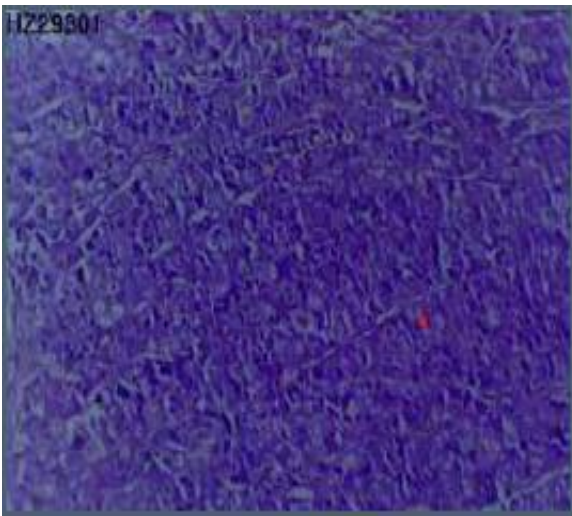


Fig 4: Microscopic observation of the tissue specimen

Conclusion

Equine testicular seminomas are rare which can be single, bilateral or multiple. Clinical examination and history can suggest testicular growth but a biopsy (fine needle or excisional) is indicated for definitive diagnosis in cases where testicular neoplasia is suspected. Orchidectomy is simple, can be both diagnostic and therapeutic in case of testicular neoplasia.

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