

Observation of squamous cell carcinoma in a goat flock in Iran

Omidi, A.^{1*}, Namazi, F.², Pourmirzaei, HR.³, Mohebbi-Fani, M.¹

¹Department of Animal Health Management, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

²Department of Pathobiology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

³Veterinary Master Bureau of Yazd province, Yazd, Iran

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Correspondence

Omidi, A.

Department of Animal Health Management, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

Tel: +98(71) 36138745

Fax: +98(71) 32286940

Email: aomidi@shirazu.ac.ir

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Case History

Squamous cell carcinoma (SCC) is a malignant tumor of squamous epithelial cells (Ladds and Entwistle, 1977). It is observed more frequently among cattle and horse, affecting horn and the eye, but it is also seen in other species. Signs of ulceration and hemorrhage from SCC lesions have been described with various locations in the body including lumbar back of a ewe (Najarnezhad and Aslani, 2014), frontal region of the head in a ewe (Almeida e Macedo, et al., 2013), floor of the mouth of a sheep (Namjoo et al., 2012), maxilla of a ewe (Al-Kennany and Qathee, 2013), the nasal cavity of a cow (Baniadam et al., 2010), the dorsal part of the neck of an Iranian buffalo (Kohli

Abstract:

Squamous cell carcinoma (SCC) is a tumor consisting of squamous epithelial cells. This tumor is relatively uncommon in goats. In this report, we discuss clinical, gross and histopathological features of SCC in six goats. The goats were referred to the veterinary clinic with a progressive ulcerative and hemorrhagic mass located in the perineal area. The vital signs (temperature, pulse rate, respiration rate) were normal. Biopsy specimens were taken and histopathological examinations were done. The tumor cells were large and had an abundant eosinophilic cytoplasm, ovoid nuclei with a prominent nucleolus. Keratin tonofibers and keratin pearls were also seen. The mitotic figures were moderate. The mass was found to be a moderately differentiated SCC. Ulceration with infiltration of neutrophils was observed on the surface of the tumors. The SCC tumors are uncommon in goats and have multi-factorial etiology. Age, ultraviolet (UV) light exposure, lack of epidermis pigmentation, and viruses may be involved in the presence of SCC.

and Ghadrnan Mashadi, 2008), the ventral aspect of the abdominal wall of a Magha-teer female camel (Al-Sobayil and El-Amir, 2013), and the oral cavity of an opossum (*Didelphis virginiana*), (Kim et al., 2002). Ulrich et al. (2014) described an oral SCC extended from the oral cavity into the right maxilla, nasal turbinates, and nasal septum of a red deer (*Cervus elaphus*). In Merino ewes, a high prevalence of vulvar SCC has been attributed to chronic exposure to solar radiation of the skin with poor pigmentation or with sparse hair cover (Baipoledi, 2001). SCC is a common neoplasm in the old dog and cat, found on the skin in various locations (Zachary and McGavin, 2013). The tumor is uncommon in goats, although Yeruham et al. (1993) reported perineal

SCC in two aged goats existing for long periods of time (1 to 3 years). Ocular SCC in twin goats (aged 3 years, one male and one female) was described by Mara et al., (2005). Etiology of the SCC is multi-factorial. Age, ultraviolet (UV) light exposure, lack of epidermis pigmentation, and viruses may involve in the presence of SCC (Tsujita and Plummer, 2010). In this report, we describe the clinical, gross and histopathological characteristics of an outbreak of perineal and cutaneous SCC in a goat flock from Yazd Province, Iran, with a look at the epidemiological occurrence of the disease. In June 2013, a goat owner referred six adult goats with the obvious perennial and cutaneous lesions to the last author of this article. The whole flock consisted of 160 mixed breed goats (40 males and 120 females) and was ranches in the Bondorabad village of Saduq city (32° 1' 48" North latitude, 54° 6' 36" East longitude) in Yazd province, central Iran. The area has a dry climate with temperatures up to 45 °C in summer and annual rainfall about 120 mm. Throughout the year, the flock grazed on poor pastures and stubbles and received some supplementary feeds such as the residues of cucumber plant (obtained from greenhouses in the village), wheat straw, alfalfa hay and barley grain. White salt lick was the only mineral supplement offered to the goats. Oral Albendazole was drenched twice a year for treatment and prevention of parasitic infections.

Clinical Presentation

The lesions were observed in six goats during one year on the skin of perineal region and were similar in shape and developing features in all affected goats. At first, the lesion looked like a mass of blood clot

under the tail inducing an appearance like a cabbage flower (Figure 1, A and B) within a few days. The animals felt itching and repeatedly rubbed the lesion on objects like walls. The lesions were very fragile and bled with minor palpation. Except in one goat that the lesion occupied the entire perineal area, the lesions were 20-30 mm in diameter and 5 to 20 mm in height (Figure 1, C). After a while, the lesions were covered by a black keratinous exudate (Figure 1, D) and had a bad odor. The vital signs (temperature, pulse rate, respiration rate) of mentioned goats were normal. Several drugs like spray and parenteral antibiotics (such as oxytetracycline and penicillin) were tried by the owner to treat the lesions. There were no obvious changes in feeding behavior and quantity of milk in affected goats.

One or two weeks after the initiation of the main lesions in the perineal and/or tail region, hairless areas (30 to 50 mm in diameter) were formed on areas such as the back and the lateral sides of the body of affected goats from neck to flank (Figure 2, A), over time (one month), hairless areas were keratinous in shape (Figure 2, B). In the field evaluation of the flock, the remainder of the goats were examined for the perineal and skin lesions, but no lesions were detected.

Diagnostic Testing

Tissue samples were taken from masses found on the perineal and/or tail regions under local anesthesia in the first step. Tissue samples from the lateral sides of body postponed the second step. Tissue specimens were removed by excisional biopsy, fixed in 10% neutral buffered formalin, processed routinely and embedded in paraffin. Sections were made at 5 µm, stained with he-

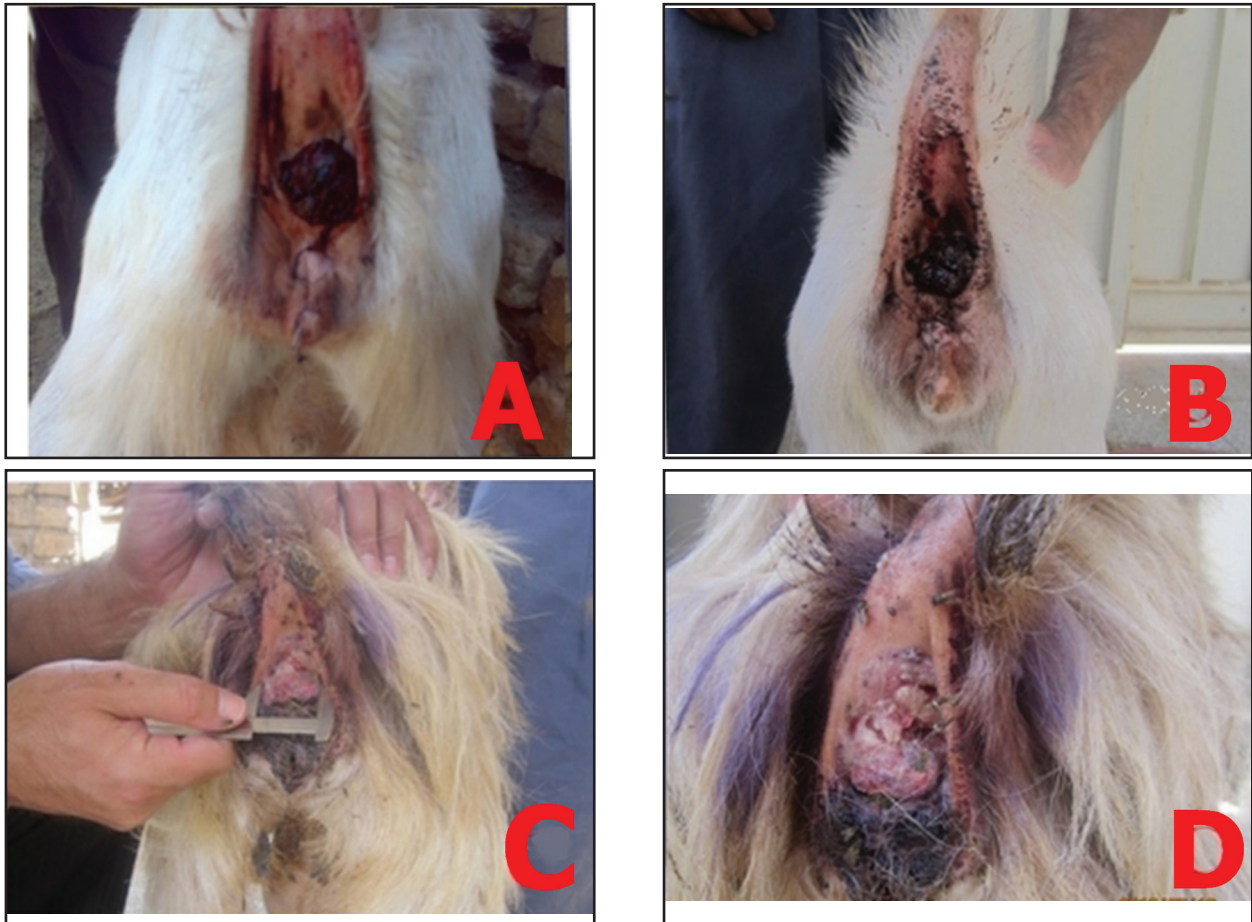


Figure 1. Squamous cell carcinoma (SCC) of the perineal and/or tail region of the goats, cabbage flower appearance masses (A&B), the lesions were 20-30 mm in diameter and 5 to 20 mm in height (C), and with black keratinous exudate (D).



Figure 2. Hairless areas (30 to 50 mm in diameter) were formed one or two weeks after initiation of the lesions in the perineal and/or tail region, keratinous shaped lesions were formed on areas such as the back and the lateral sides of the body of affected goats from neck to flank (A&B).

matoxylin and eosin (H&E) and studied by light microscope. Grossly, the masses were irregularly shaped, cauliflower-like and ulcerated. Histopathological features revealed

the cords and islands of squamous epithelial cells, which extended into the dermal layer (Figure 3A). The tumor cells were large and had an abundant eosinophilic cytoplasm,

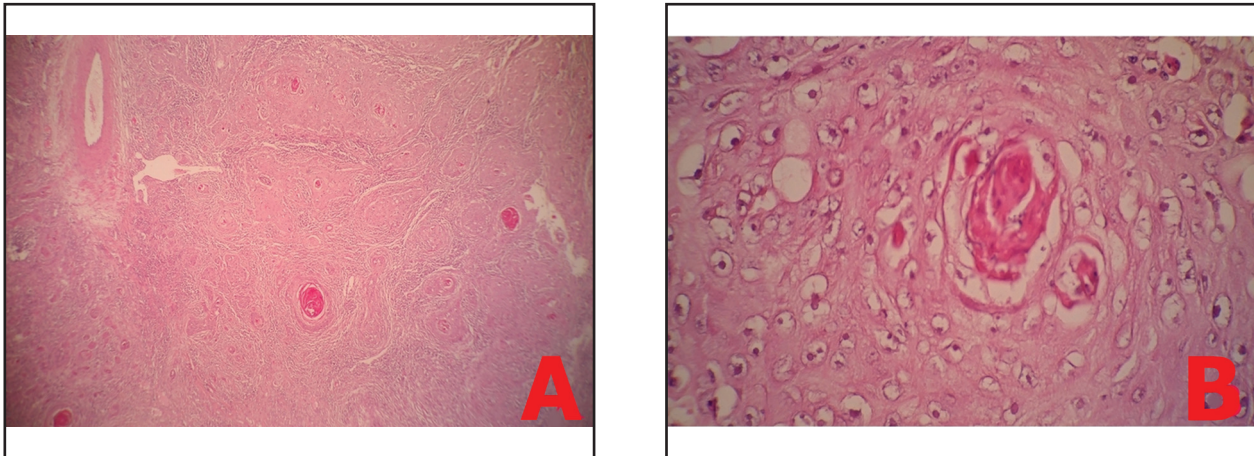


Figure 3. A) Cords and islands of squamous neoplastic cells with “keratin pearls”. H&E.×72. B) The large cells with abundant eosinophilic cytoplasm, ovoid nuclei and a prominent nucleolus are seen in the tumor section, H&E. ×720.

along with large ovoid nuclei with a prominent nucleolus (Figure 3B). Keratin tonofibers and keratin pearls were also seen. The mitotic figures were moderate. The masses were found to be moderately differentiated SCC. Ulceration with infiltration of neutrophils was also observed on the superficial part of the tumor.

Assessment

Neoplasms are rare in goats compared with other farm or zoo animals (Namjoo et al., 2012; Zubaidy, 1976). The reason for the low prevalence of SCC in goats is not known, but it has been suggested that goats are usually slaughtered before cancer age is attained (Zubaidy, 1976). The perineum has been reported to be a common location of SCC in goats (Yeruham et al., 1993). In the present study, six goats out of 160 (3.7%) were visibly affected with SCC during one year. Similar to our findings, Vandegraaff (1976) stated that 12 ewes in a 385-head flock (3.1%) were affected with SCC. SCC is multifactorial in etiology with several risk factors including prolonged exposure to UV light and lack of pigment within the epidermis at the sites of tumor development

(Meuten, 2008). In the present study, all affected goats were white (4 goats) or amber (two goats) in color. In Merino ewes, a high prevalence of vulvar SCC has been attributed to chronic exposure to solar radiation of the skin with poor pigmentation or with sparse hair cover (Baipoledi, 2001).

SCC is most commonly found in adult or aged animals (Baipoledi, 2001) and the strong association between age and the presence of lesions may be a direct function of the length of exposure to solar radiation (Swan et al., 1984). In the present investigation, affected goats were >4 years old. The shape and the posture of the tail of the goats, and lack of pigmentation of the underside of the tail, predisposed them to perineal SCC (Baipoledi, 2001). In a survey on the prevalence of cancer of the perineal region of ewes, the majority of SCC lesions involved the vulva (88.9%), the tail (23.8%) and the perineum (12.8%) (Hawkins et al., 1981). It has been suggested that papovavirus and papilloma virus infections may be predisposing factors to ovine SCC (Aitken, 2008; Omer, et al., 2006).

Sampling of the lesions in the hairless skin could not be performed in the second step, since 60 goats of the flock, including

the affected goats died of an organophosphate poisoning in the next month. The survivors of poisoning were under monitoring for evidence of new cases, but till one year later no cases were observed. Whether or not these lesions were due to viral infections that coincided with SCC remains ambiguous. Fungal infections could be ruled out because of the dry climate of the area particularly during summer. In conclusion, histopathological examination was a definitive diagnosis of perineal SCC. The infiltrative nature, central areas of keratinization and cord of neoplastic cell or pearl shape, are characteristics of perineal SCC. The epidemiology and geographical distribution of SCC of goats needs further investigation.

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Conflict of interest: The authors declare that they have no conflict of interest.

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مشاهده کارسینوم سلول‌های سنگفرشی در یک گله بز در ایران

آرش امید^۱، فاطمه نمازی^۲ حمیدرضا پور میرزائی^۳ مهدی محبی فانی^۱

(۱) گروه مدیریت بهداشت دام، دانشکده دامپزشکی، دانشگاه شیراز، ایران

(۲) گروه پاتوبیولوژی، دانشکده دامپزشکی، دانشگاه شیراز، ایران

(۳) اداره کل دامپزشکی استان یزد، یزد، ایران

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چکیده

کارسینوم سلول‌های سنگفرشی (SCC) تومور متشکل از سلول‌های اپیتلیال سنگفرشی است. این تومور در بزها نسبتاً غیرمعمول است. در این گزارش ما در مورد ویژگی‌های بالینی، چهره قابل مشاهده و هیستوپاتولوژی SCC در شش بز بحث می‌کنیم. بزها به کلینیک دامپزشکی به دلیل داشتن توده با خصوصیات اولسراتیو و هموراژیک پیش‌رونده در ناحیه پرینه، ارجاع شدند. علائم حیاتی (دما، ضربان قلب، میزان تنفس) طبیعی بود. نمونه‌های بیوپسی گرفته شد و آزمایش‌های هیستوپاتولوژی انجام شد. سلول‌های توموری، بزرگ با سیتوپلاسم آئوزینوفیلی فراوان، هسته‌های تخم‌مرغی و هستک‌های برجسته بودند. تونوفیبرهای کراتینه و اشکال مرواریدی کراتینه دیده شد. چهره میتوتیک متوسط بود. توده‌ها به‌عنوان SCC نسبتاً تمایز یافته تشخیص داده شدند. زخم بانفوذ نوتروفیل‌ها در سطح تومورها مشاهده شد. تومور SCC در بزها غیرمعمول است و اتیولوژی چندعاملی دارد. قرار گرفتن در معرض نور (ماوراءبنفش)، رنگ‌دانه‌های پوست و ویروس‌ها ممکن است در ایجاد SCC دخالت داشته باشند.

واژه‌های کلیدی: بز، هیستوپاتولوژی، توده، کارسینوم سلول‌های سنگفرشی (SCC)، اولسراتیو

* نویسنده مسئول: تلفن: ۳۶۱۳۸۷۴۵ (۷۱) ۹۸+ نمابر: ۳۲۲۸۶۹۴۰ (۷۱) ۹۸+ Email: aomidi@shirazu.ac.ir