ADENOMA AND ADENOCARCINOMA IN SHEEP AND GOATS

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ABSTRACT

In the present investigation, a total number of 26 sheep and 15 goats were surveyed for abnormal masses showed frequently on the skin areas of both animals (eye lids, ears, lips, nose, trunk and perineal). A characteristic clinical signs represented as cachexia, emaciation and anemia. The excised masses appeared grossly as nodular and papillary of dome-shaped. Cross section was ulcerated, necrotized and bleeding surfaces of some cases. Different kinds of neoplasm showed in the present search, were noticed using the routine technique of histopathology as available method of tumor diagnosis. Also cystic papillary with and/or without epithelial hyperplasia of adnexal sweat glands (apocrine) besides polycysticadenoma and polycysticadenocinarcoma also detected. Finally, intranasal adenocarcinoma as a characteristic nasal epithelial tumor also observed. Surgical excision aimed to treat the case and to decrease the economic losses for the owners owing to the culling of the animals from the herd.

INTRODUCTION

The evidence from published information and short economic life of the sheep and goats would cause one to believe that tumors in both animals were of little significance. A proportion of tumors are symptomless, being early cases found during routine meat inspection, other cause vague ill-health, resulting in culling of animals which are going back in condition (Anderson et al., 1969).

Tumor growth depends on cellular proliferation and cell death, including apoptosis. In tumor pathology, apoptosis is a major factor that limits the growth of neoplasm. The production of tumor cells as a factor that prevent apoptosis is an important mechanism in development of uncontrolled growth (Alan et al., 2002).

An increased frequency of tumors has been reported in human being (Slominiski et al., 1995).

Considering that companion animals may in part be exposed to the same environmental factors as hum-
Ahmed et al., 1999. The interest in these tumors in companion animals is renewed (Roles et al., 1999).

Enzootic intranasal tumor appears glandular in type and has recently been classified as an adenocarcinoma of low malignancy. Morphologic and ultrastructural investigations showed two growth types of enzootic intranasal tumor: i.e., tubular and papillary patterns. Conventional histochemistry revealed the presence of neutral and carboxylated glycoconjugates in the olfactory glands and in the tubular part of enzootic intranasal tumor, as well neutral and sulphated glycoconjugates in the respiratory glands and in the papillary part of enzootic intranasal tumor, suggesting that the papillary pattern tumor arises from the respiratory glands, whereas the tubular portion of arises from the olfactory glands. Origin of enzootic intranasal tumor in the goat (Capra hircus): A glycohistochemical approach (Scocco, et al., 2001).

Enzootic nasal tumor virus and jaagsiekte sheep retrovirus are closely related retroviruses that cause epithelial cancers of the respiratory tract in sheep and goats. (Neal et al., 2005). Jaagsiekte retrovirus causes ovine pulmonary adenocarcinoma, a transmissible lung cancer of sheep. The envelope glycoprotein protein of Jaagsiekte retrovirus functions as a dominant oncoprotein in vitro and in vivo. Mutation of the Jaagsiekte retrovirus open reading frame orfX, for which no function has yet been attributed, did not alter the disease induced by Jaagsiekte retrovirus. (Chris et al., 2007).

Jaagsiekte Sheep Retrovirus is a betaretrovirus infecting sheep. This virus is responsible for a pulmonary adenocarcinoma, by transformation of epithelial cells from the bronchioli and alveoli. This animal cancer is similar to human bronchioloalveolar cancer, a specific form of human lung cancer for which a viral etiology has not yet been identified (Caroline et al., 2007).

MATERIALS & METHODS
Animals:
A total number of 41 animals (26 sheep and 15 goats) of different forms of adenoma and adenocarcinoma were detected. Each animal was studied carefully (history, housing, number of tumors) as well as, each tumor was examined grossly (seat, form, colour, size, surface, bleeding and attachment to the underneath tissue).

Surgical manipulation and sampling:
Total excision of the tumors were performed at the lateral recumbancy position under the effect of xylazine 2% in a dose of 0.1mg/kg I/M and ring block infiltration analgesia around the tumor with lidocaine Hcl 2%.

Specimens were taken from different parts of the excised tissue and fixed in 10 % buffered formalin. Paraffin sections (4μ thick) were cut and stained with haematoxylin and eosin. Some of paraffin sections were
stained with periodic acid Schiff’s (PAS) stain (Bancroft and Stevens, 1975) for demonstrating carbohydrates content.

RESULTS
In the present investigation, the gross picture of the adenoma and adenocarcinoma were single or multiple firm masses. There many shapes when inspected, nodular as well as papillary, dome in shape of smooth, ulcerated and bleeding surfaces. Other cases were superficially necrotized and appeared in many areas of skin mostly ear (Fig. 1), lips (Fig. 2) and eye lids (Fig. 3).

Table (1): Numbers and types of the recorded adenoma and adenocarcinoma:

<table>
<thead>
<tr>
<th>Seat</th>
<th>Number of cases</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sheep</td>
<td>Goat</td>
</tr>
<tr>
<td>Naemi</td>
<td>Nagdi</td>
<td>Native</td>
</tr>
<tr>
<td>I- Head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye lids</td>
<td>2 - 2</td>
<td>2</td>
</tr>
<tr>
<td>Ears</td>
<td>7 5 12</td>
<td>3 2 5</td>
</tr>
<tr>
<td>Lips</td>
<td>1 1 2</td>
<td>2 3 5</td>
</tr>
<tr>
<td>Intranasal</td>
<td>1 - 1</td>
<td>-</td>
</tr>
<tr>
<td>II- Trunk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>5 4 9</td>
<td>-</td>
</tr>
<tr>
<td>IV- Perineal</td>
<td></td>
<td>2 1</td>
</tr>
</tbody>
</table>

| Total      | 16 10 26 | 7 8 15 | 41    |

Eye lids: -
Ocular adenoma and adenocarcinoma were recorded in 4 cases (2 sheep and 2 goats). The breeds of the affected animals were illustrated in Table (1). Surgical removal of the tumor masses were done in all cases under effect of tranquilizer and local infiltration analgesia of the upper and lower eyelids.

Ears: -
Adenocarcinoma of the ears were recorded in 17 cases (12 sheep and 5 goats). The swellings were orange size with dark patches with bleeding surface. They originated at different site of the ear conca. Trimming were performed in the 17 cases.

Lips: -
Lips adenocarcinoma were recorded in 7 cases (2 sheep and 5 goats). The swellings were appeared as a large dome shape with ulceration attached to the lower lip.
Intranasal:—
Intranasal adenocarcinoma was detected in one case of Naemi sheep which was incomplete bilateral one

Trunk: -
All adenoma and adenocarcinoma of the trunk were recorded only at the backof 9 sheep (5 Naemi and 4 Nagdi).

Perineal:—
The tumor was diagnosed in 3 goats (2 Native and one Syrian). The tumor was cauliflower-like in shape, orange in size, originated from the line connecting between the skin of the perineal region and the mucous membrane of the rectum.

Concerning the adnexal tumors of skin, the macroscopical changes were white, raised, multi-lobulated as well as papillated alopecia nodules. Pathological changes represented by adenomatous changes of the sweat glands (Fig. 4).

Poly cyst adenoma in some cases represented by hyper-plastic cystic gland that lined with 1 – 3 layers of tall columnar secretory epithelial cells, dilated lymphatics, periglandular lymphocytic cell infiltration. The lumen of the cystic glands invaded by neoplastic cells and contained eosinophilic fluid (Fig. 5). Other glandular cases showed numerous mitotic figures, vacuolated hyper-plastic cells, vacuolated eosinophilic sebum materials and periglandular signet shape neoplastic cells giving the suppose to cystic adenocarcinoma (Fig 6).

Advanced cases of cystic adenocarcinoma represented by prominent nucleoli, nuclear pleomorphism, nuclear hyperchromacia, abnormal mitotic figures, necrotic glandular structure, cystic hyperplasia, periglandular fibrosis, necrosis with sloughing cells in the lumen. All the previous mentioned micro-anatomical changes give a good chance for cystic adenocarcinomatous tumor (Fig. 7).

Concerning the intranasal tumor showed in the present investigation was diagnosed as nasal adenocarcinoma. The gross picture, noticed was large, bilateral pink nodular mass (Fig. 8). The microscopic picture revealed epidermal necrosis as well as hyperplasia and dermatitis and edematous changes, hypertrophic dilated glandular structures, nuclear hyperchromacia, mitotic figures and extensive periglandular mono nuclear cells infiltration and apoptosis (Fig. 9 and 10).

Other cases showed multifocal glandular dilation with extensive periglandular mononuclear cell infiltration (Fig. 11). Dermatitis, focal eosinophilic necrotic mass replaced the glandular structure noticed. Glandular goblet cells hyperactivation, atrophy, necrosis with severe dermatitis also observed.
Fig. (1): Showing adenocarcinoma of the ear pinna in a Naemi sheep.

Fig. (2): Showing lower lip adenocarcinoma (white arrow) in a syrian goat.

Fig. (3): Showing lower eye lid adenoma in a Naemi sheep.
Fig (4): Skin adnexal changes represented by cystic dilatation of sweat gland without apparent hyperplasia, dermal collagenolysis and necrosis. H&E. X200.

Fig (5): Sweat gland Showing, the hyper-plastic tall columnar secretary epithelial cells lining the sweat gland, interglandular leucocytic infiltration and vacuolated structurless, eosinophilic fluid in the lumen. H&E X 200.

Fig (6): Cystic adenocarcinoma of sweat gland showing hyper-plastic, vacuolated epithelial lining, numerous mitotic figures, neoplastic clump and signet ring cells around and invading the cystic glands that contain eosinophilic and vacuolated sebum. H&E X400.

Fig (7): Sweat gland adenocarcinoma (Cystic types): polycystic glands, numerous mitotic figures, nuclear hyperchromacia periglandular fibrosis, glandular atrophy, necrosis and clumping of neoplastic cells infiltration. H&E X200
Fig (8): Intranasal tumor gross picture, with large, bilateral pink nodular mass.

Fig (9): Intranasal tumor showing acanthosis, dermal edema and cellular infiltration, PAS stain X 100.
Fig (10): Cystic adenomatous gland with periglandular or mononuclear leucocytic cells infiltration, apoptic cells, abnormal mitotic figures and nuclear hyperchromacia, H&E. X 200.

Fig (11): Multifocal cystic dilatation with periglandular lymphocytic cells infiltration, PAS X 200.

DISCUSSION

Owing to the short economic life of both sheep and goats, the long incubation period of the neoplasm to induce a characteristic clinical signs, usually the diagnosis of neoplasia in sheep and goats occurred so late, particularly at the abattoirs. The present investigation aimed to increase the lack information about the sheep and goats neoplasia.
Different types of adenxia as well as vascular skin tumors besides intra nasal one were observed.

Cellular proliferation and cell death including apoptosis (substantial loss) were the most characteristic features of neoplasia in the present investigation and this is the same line to those results detected by (Walker et al., 1988).

Cystic hyperplasia of sweat gland, polycystic adenoma and cystic adeno carcinoma were of the most important skin adnexal tumors occurred in sheep and goats represented by extensive lumen dilatation of sweat gland that lined with 1–2 layers of tall columnar secretory epithelial cells of the ordinary sweat gland. Also lumen contained eosinophilic, vacuolated fluid and or sebum and some of the features of malignancy were also reported. The extreme invasion and infiltration of the mononuclear leukocytic cells were mostly lymphocytes considering a good response for the effect of the tumor on the immune system.

Similar results were discussed by (Thomson, 1988 and Jubb et al., 1993).

The cytoplasm of the epithelial cells had numerous periodic acid–Schiff-positive and diastase-resistant granules. Ultrastructurally, the cytoplasm of the neoplastic cells contained numerous pleomorphic secretory granules and microvilli, which partially covered the luminal surface of the tumor cells. On the basis of histological and ultrastructural findings, this tumor was diagnosed as a tubulopapillary adeno carcinoma, arising from apocrine sweat glands of the skin. Similar results were discussed by (Federico et al.; 2005).

An intranasal adenocarcinoma was reported in the present investigation represented by nuclear pleomorphism, hypertrophy and hyperplasia of glandular pattern, a type and abnormal mitotic figures observed.

Also diffuse leucocytic infiltration, apoptosis, edema and collagen-lysis were also showed. Typical lesions recorded by (Yonemichi et al., 1978; Dixon and Head, 1999 and Mellonby et al., 2002).

The complete genome sequence of a new isolate of enzootic nasal tumour virus, associated with enzootic nasal adenocarcinoma of goats, was determined. The genome exhibits a genetic organization characteristic of b- retroviruses. The same cases suggested as reported by (Aurora et al.; 2003).

We can conclude that, the adenoma and adenocarcinoma representing a reflexion to the bad environmental condition which resulted in economical losses (ultraviolet and sun rays exposure in skin), surgery is a good mean for tumor treatment with the respect to the recurrence as well as the animal survival and we introduced the technique of pathology as a valuable method for neoplastic diseases diagnosis in sheep and goats.
REFERENCES

*Ahmed et al.,*


*Mellanby, R. J.; Stevenson, R. K.; Heritage, M. E.; White, S. A. R. and


الملخص العربي

الورم الغدي الحميد والخبيث في الأغنام والماعز

قامت هذه الدراسة بعمل مسح للأورام الغريبة والتي توجد في مناطق من الجلد والأغشية المخاطية والمغلفة المغلفة. وقد تمت المغلفة المغلفة بسهم وحيد ومعاينتها. حيث ظهرت على الحيوانات العديد من الأعراض المتمثلة، في الطرد، الضغط، وفقر الدم. وقد ظهرت الأورام المزالة بالعين المجردة في صورة قلب بها عقد وحليمات. وباستخدام الفحص الهيستوبيولوجي كطريقة متاحة لتشخيص العديد من الأورام السرطانية المختلفة ل량 وزن أسطح

ناجحة ومتكررة بها قشر. ويوجد أيضاً كيس حليمي من غير فرط النسيج الظاهر لنواحي الغدد العرقية إلى جانب ورم غدي متعدد الكيس وورم غدي خبيث متعدد الكيس. في النهاية، وجد الورم الغدي الخبيث داخل الأنف المميز كسرطان للطبقة الطلانية للأنف وتعتبر الإزالة الجراحية هي الهدف في العلاج لتقليل الفاقد الاقتصادي لصاحب الحالات والنتائج عن ذبح الحيوان وخروجه من القطع.