MELANOMA AND MALIGNANT MELANOMA IN SHEEP AND GOATS

I. H. Ahmed*; M. S. Mohammed*; F. A. Al-Sobayil° & E.E. Mehana°

* Suez Canal University, Egypt and °Al-Qassim University, Saudi Arabia

ABSTRACT

In the present investigation, a total number of 22 sheep and 29 goats were surveyed for abnormal masses showed frequently on the skin areas (ears, lips, trunk and perineal region) and eyes (either unilateral or bilateral) of both animals. A characteristic clinical signs represented as cachexia, emaciation, anemia and exophthalmic eye or both eyes. The excised masses appeared grossly as nodular and papillary maculae of dome-shaped. Different colors varied from dark brown, pink to black bluish especially the malignant melanoma. Melanoma and malignant melanoma were subjected to the routine technique of histopathology as available method of tumor diagnosis. Malignant melanoma of skin and eyes represented as Cutaneous malignant melanoma (mixed epithelium, spindle and round cell types), while intraocular malignant melanoma (originated mainly from third eyelid) was of whorled or fibrosarcoma like and the mixed cells type. 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 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 are vague. Ill-health, resulting in culling of animals is going back in condition (Anderson et al., 1969).

Pathologically, there are three main groups of tumors: benign, malignant with high metastatic potential and locally invasive tumors (Misdrop, 1987). The histological differentiation among the three groups of tumors is based on characteristics such as histological type, the growth pattern, the degree of differentiation and the mitotic index (Weiss, 1974).
Tumor growth depends on cellular proliferation and cell death, including apoptosis (Kerr and Searle, 1972). Spontaneous apoptosis has been recorded in variety of malignant neoplasm, sometimes resulting in substantial cell loss (Walker et al., 1988). In tumor pathology, apoptosis is a major factor that limits the growth of neoplasm. The production of tumor cells is a factor that prevents apoptosis which acts as an important mechanism in development of uncontrolled growth (Alan et al., 2002).

An increased frequency of melanoctytic 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 humans, the interest in these tumors in companion animals is renewed (Roles et al., 1999).

Kopf (1988) reported that, malignant melanomas in human patients are the most serious cutaneous neoplasm. A considerable number of markers have been applied to discriminate between malignant and benign melanomas and to obtain new prognostic parameters (Hernberg et al., 1998).

Melanin is the brown pigment of the skin, hair, mucosa, lepto meninges and choroid of the eye in higher vertebrates. Melanocytes stem from melanoblasts which is a non-pigmented precursor cell of neural crest origin. Melanocytes are normally found in various ocular structures in addition to the skin, and they may be also present in the meninges, adrenal gland and endocardium and intema of blood vessels in some species. Melanocytic tumors including melanoma can develop in the skin, the mucous membranes, the eye and eye lids "nictitating membrane (Pulley and Stannard, 1990).

The immunoglobulin superfamily protein is involved in transendothelial migration and signal transduction, and is expressed in malignancies including cutaneous melanoma. These observations further suggest a role for in uveal melanoma growth, moreover, interactions between immunoglobulin superfamily protein positive melanoma cells and vasculature may be important for the hematogenous spread of cells during metastases. (Lai et al.; 2007).

Many goals for the present study, one of them is to throw light upon the incidence of melanoma and malignant melanoma in sheep and goats, using the histopathological technique as pronounced technique for diagnosis and the surgery as a less expensive and available technique for their radical treatment as a trial to decrease the adverse drawbacks of the tumors on the animal life and marketability.
MATERIALS & METHODS

Animals:

A total number of 51 animals (22 sheep and 29 goats) of different forms of melanoma and malignant melanoma 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%* at 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 % neutral Buffered formalin.

Paraffin sections (4μ thick) were cut and stained with Haematoxylin and Eosin (Bancroft and Stevens, 1975).

RESULTS

The gross picture of the malignant melanoma either Cutaneous or intraocular type were single or multiple firm masses of dark brown to deep black in color. In cut section, the sliced tumors when put in water give the pathognomic ink like coloration. Some cases, showed unilateral as well as bilateral exophthalmia and damaged eye and nodular as well as papillary maculae, dome in shape of smooth, ulcerated and bleeding surfaces. Finally, other cases were superficially necrotized (Fig 1 – 6).

Table (1): Numbers of the recorded melanoma and malignant melanoma in sheep and goats:

<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></td>
<td>Naemi</td>
<td>Nagdi</td>
</tr>
<tr>
<td>I- Head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ocular</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Ear</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Lip</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>II- Trunk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>IV- Perineal</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

* Xylaject, ADWIA.
** El-Nasr pharm. Chemicals Co. for Al-Debeiky pharma.
Ocular: -

Ocular melanoma and malignant melanoma were recorded in 19 cases (7 sheep and 12 goats). The breeds of the affected animals were illustrated in Table (1).

Surgical excetration of the eye were done in all cases under effect of tranquilizer and local infiltration analgesia of the upper and lower eyelids in combination with optic nerve block.

Ears: -

Malignant melanoma Of the ears were recorded in 8 sheep (5 Naemi and 3 Nagdi). The swellings were orange size with bleeding surface. They originated at the junction between the dorsal and ventral surfaces of the ear conca. Trimming were performed in the 8 cases.

Lips: -

Lips were recorded in two Syrian goats. The swellings were appeared as a large dome shape and attached to the lower lip.

Trunk: -

All Malignant melanoma and melanoma of the trunk were recorded only at the back. They were 11 cases (7 sheep & 4 goats). One of these cases was one-day-old kid and the melanoma found at the dorsum (Fig. 7). Surgical removal was done under the effect of local infiltration analgesia, the removed mass appeared orange in shape and size, dark grayish brown in colour. It looked exactly as a hepatic tissue in cut section (Fig. 8)

Perineal: -

The tumor was diagnosed in 11 goats (5 Native and 6 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.

The pleomorphic cell type, some apoptic cells, rounded as well as spindle cell types showed besides the cellular pleomorphism and numerous mitotic figures. In addition to, melanophages and mononuclear cells were infiltrated (Fig. 9). Diffuse melanin that obscured the cellular outline carrying cells beside fine delicate stroma also detected in some other cases (Fig. 10).

Features of malignancy were observed in intraocular type of malignant melanoma as the following: whorled or fibro sarcoma like type and mixed cell types detected. The numerous mitotic figures as cellular pleomorphism and nuclear pleomorphism, more than one nucleoli inside the nucleus, prominent nucleoli, nuclear hyperchromacia, high nucleus to cytoplasm ratio, diffuse dark brown melanin pigment inside the melanophages, apoptic cell, and delicate eosinophilic stroma. The cells in some cases were in whorled directed manner observed in this type of tumor that originated mainly from orbital cavity and the third eyelid (Fig 11).
Fig. (1): Showing unilateral exophthalmic damaged eye in a goat.
Fig. (2): Showing gross appearance of the removed malignant melanoma from the unilateral exophthalmic goat.
Fig. (3): Showing third eye lid melanoma in sheep.
Fig. (4): Showing Cutaneous melanoma in a sheep’s ear conca.

Fig. (5): Showing Cutaneous melanoma in the anal opening in a goat.
Fig. (6): Showing gross appearance of the removed tumor mass from the perineal area.
Fig. (7): A one-day-old male Syrian breed kid has an orange size swelling at the right dorso-lateral aspect of his neck.
Fig. (8): showing Cutaneous melanoma of one-day-old kid was orange in shape and size, dark grayish brown in colour. It looked exactly as a hepatic tissue in cut section, in addition to presence of multilobulated masses inside it.
Fig. (9): Apoptic cell structures, epitheloid, oval, round and spindle tumor cells, and mononuclear cells infiltration. H&E. x 200

Fig (10): Diffuse dark brown (black) melanin pigments within melanoblasts or melanophages among fine delicate stroma. H&E. x400

Fig (11): Intraocular MM showing apoptic cell, numerous mitotic figures, prominent nucleoli, and pleomorphism. H&E. X 400
DISCUSSION

The present investigation aimed to increase the lack information about the sheep and goats neoplasia.

Different types of malignant melanoma in different sites of the body either skin (Abdomen, neck and oral) and one or both eyes, causing severe damaging of the eye resulting total ex- tirpation of eye in some cases, as nictitating membrane "3rd eyelid", uvea, choroids and the orbital cavity of the eye generally. These results also were parallel to those reported by (Pulley and Stannard, 1990).

The cutaneous malignant melanoma was of mixed cell types (Round, epitheloid and spindle cell types), while the ocular form of malignant melanoma was of both types (mixed cell types and whorled or fibrosarcoma like types). All the previous mentioned results were in coincide with those reported by (Garma et al., 1981; Thomson, 1988; Martin and Aitken, 1991; Jones and Hunt, 1997; Rubin and Farber, 1998) and Milanta et al., 2002).

We can conclude that, the malignant melanoma representing a reflexion to the bad environmental condition which resulted in economical losses (ultraviolet and sun rays exposure in pigmented 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 besides the highly modernizing kits markers (eg. S100 for MM) of immunohistocchemistry.

REFERENCES


الملخص العربي

الورم القيتيامنی الحميد والخبيث في الأغنام والماعاز

قامت هذه الدراسة بعمل مسمح للأورام والتي توجد في مناطق من الجلد (الأذنين والشفة والظهر والعجان) والعين سواء في عين واحدة أو العينين لعدد 22 من الأغنام و 29 من الماعز. الحيوانات تظهر بها العديد من الأعراض، مثل الهزال، الضغف، فقر الدم، خروج أحد العينين أو العينين معاً. ظهرت الأورام المزالة بالعين المجردة في صورة قبة بها عمود حليمات وقطع داكنة. تتراوح الألوان بين النبي الوردي والأحمر الداكن إلى الأزرق الداكن خاصة في الورم القيتيامني الخبيث. تم غمر القطاع العرضي لبعض الحالات في المياه إلى جانب الأسطح النازفة، المتكزة والتي بها قرح. وجد باستخدام الفحص المجهرى كطريقة متاحة لتشخيص الأورام الجديد من الأورام السرطانية المختلفة. تمثل الورم القيتيامني الخبيث في الجلد والعين في ورم قتيامني خبيث سطحي (نيسج طلياني مختلط من خلايا دائرية ومخزلية)، بينما الورم القيتيامني الحبيث في العين (التابع من الجفن الثالث) في صورة لفائف حلزونية أو مثل النسج الضام ونوع الخلايا المختلف. تعتبر الإزالة الجراحية هو الطريقة الوحيدة للعلاج ولتقليل الفاقد الاقتصادي لصاحب الحالات والنتائج عن ذبح الحيوان وخروجه من القطع.