

Pathological Study Of Cutaneous And Subcutaneous Neoplasia In Cattle In Assiut Governorate

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ABSTRACT

The present article described the occurrence and the pathological picture of cutaneous and subcutaneous neoplasia in cattle in Assiut governorate. By investigation of 100 fattening steers through the preslaughter phase 20 of them showed cutaneous, subcutaneous papilloma and subcutaneous lymphoma. After slaughtering, specimens were examined histopathologically and Immunohistochemically. The non infectious papilloma represented 45%, infectious papilloma 50% and subcutaneous lymphoma 5%.

Grossly, the infectious and non infectious papilloma appeared in the udder, chest and neck of the animals as elevated pedunculated hard mass in shape while the S/C lymphoma was small pea-shaped nodules under the skin.

Histopathologically both infectious and non infectious papilloma were similar in hyperkeratosis, acanthosis and C.T. proliferation but the presence of non purulent vasculitis with lymphocytic infiltration was characteristic to infectious papilloma. The subcutaneous lymphoma consisted of basophilic large cells with large nucleus containing irregular chromatine aggregation. The immunostaining of it revealed positive reaction for B cell marker.

INTRODUCTION

The neoplasms have a wide particular biological interest and considered to have a life threatening important in human beings and animals (1). Neoplasms of the skin and subcutaneous tissue are the most frequently recognized neoplasms in domestic animals (2). Cutaneous papillomas are benign proliferative neoplasms, the etiology and pathogenesis of which are complex (3), where the infection caused by DNA containing povavirus (3- 7). This DNA induce hyperplastic benign lesions of both cutaneous and mucosal epithelia in cattle, these lesions generally regress but may also occasionally persist, leading to cancer particularly in the presence of environmental carcinogenic co-factors (8). The non infectious papilloma caused by continued trauma increasing cell turnover which in turn increase the chance of mutations (9). Otherwise, the physical stimuli as wound, ear marking and dehorning cause papillomatosis and dermatofibroma in cattle (4,10).

Lymphoma in animals is a type of cancer defined by a proliferation of malignant lymphocytes within solid organs such as the lymph nodes, bone marrow, liver and spleen.

The disease also may occur in the eye, skin and gastrointestinal tract and it is also known as lymphosarcoma (11). Since the lymphoma is excessive cellular proliferation in response to some inflammatory or immunologic stimulus so, it may called lymphoproliferative or immunoproliferative disorders (12).

Consequently, the objective of the present study was to investigate the most commonly encountered neoplasms of skin and subcutaneous tissues in cattle in Assiut governorate and their pathological picture.

MATERIAL AND METHODS

1. Animals

A total numbers of 100 fattening steers of different ages were examined. during frequent visits to Assiut abattoir. Twenty of them showed cutaneous and subcutaneous neoplasms.

2. Specimens

After slaughtering specimens from these neoplasms were taken and prepared for.

1. Histopathological examination

The samples were termed, fixed in 10% formalin solution, five microns thick paraffin sections were prepared and stained with haematoxylin & eosin (13) and examined microscopically.

2. Immunohistochemistry

Were performed by standard technique (14).

RESULTS

Out of the investigated 20 neoplasms; non infectious papilloma was recorded in 9 cases (45%) while infectious papilloma in other 10 cases (50%) which all were more than 3 years old. The subcutaneous lymphoma was founded in only one case (5%) 2 years old cattle.

Grossly: Both infectious and non infectious papillomas were located in the udder, chest, back and at the cervical area on the neck of the animals. They were elevated from the skin surface, pedunculated in some cases or cauliflower shape in other cases. The lymphoma appeared as small (1-2 cm) pea-shaped nodules under the skin on the neck and chest. These nodules were capsulated and firm in consistency. Cut section of these nodules revealed granulated surface pale pink in color.

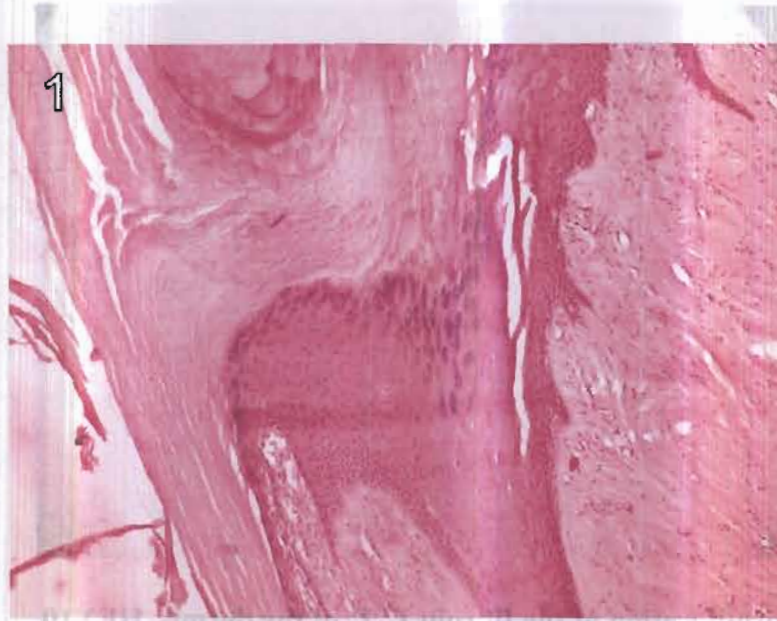
Microscopically

Non infectious papilloma characterized by hyperkeratotic elongated epidermal papillae

(Fig.1). The epidermis showed acanthosis (Fig. 2), the epidermal cells showed vacular degeneration. The dermis showed proliferation of fibrous connective tissue (Fig. 3). The normal adnexa, sebaceous gland and hair follicle were absent. Two cases from this non infectious papilloma showed picture of plexiform hemangioma as the blood vessels in this area were increased in number, more wider and irregular in shape (Fig.4a,4b). In some areas these blood vessels were surrounded with an area of hyperemia and edema.

Infectious papilloma was characterized by presence of hyperkeratosis and acanthosis with degenerated epidermal cells. The dermis showed connective tissue proliferation which consisted of fibrocyte with different size and shape. The adnexa and hair follicle were found normally. The dermis was infiltrated with lymphocytes and the blood vessels showed non purulent vasculitis with lymphocytic infiltration and thrombus formation (Fig. 5).

In subcutaneous lymphoma, follicles were consisted of basophilic cells relatively large in size than normal and containing irregular chromatin aggregation in the nuclei. This indicate prolymphocytic lymphoma (Figs. 6a, 6b & 7). The outer sinus was mainly destroyed. The immunostaining revealed positive reaction for B- cell marker (Fig.8).



Platel:-

Fig.1. Showing elongated papilli with hyperkeratosis HE X10 .

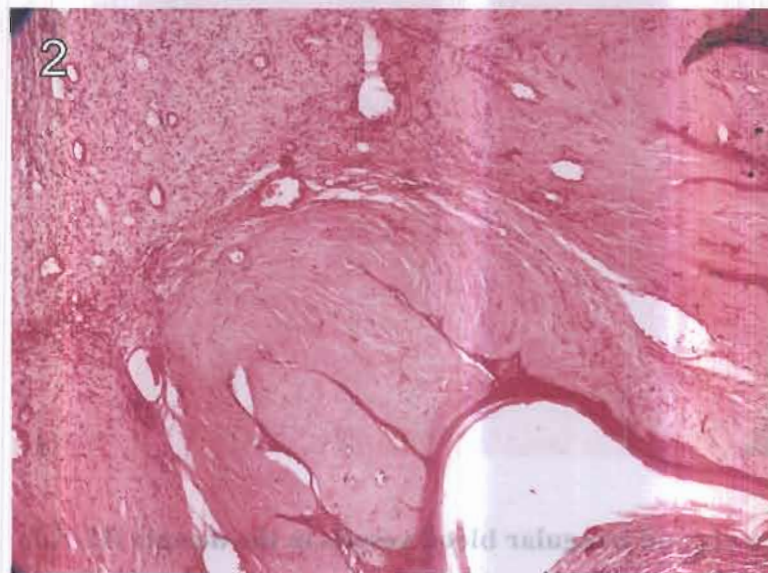


Fig.2. Showing acanthosis of the St. Spinosum HEX10

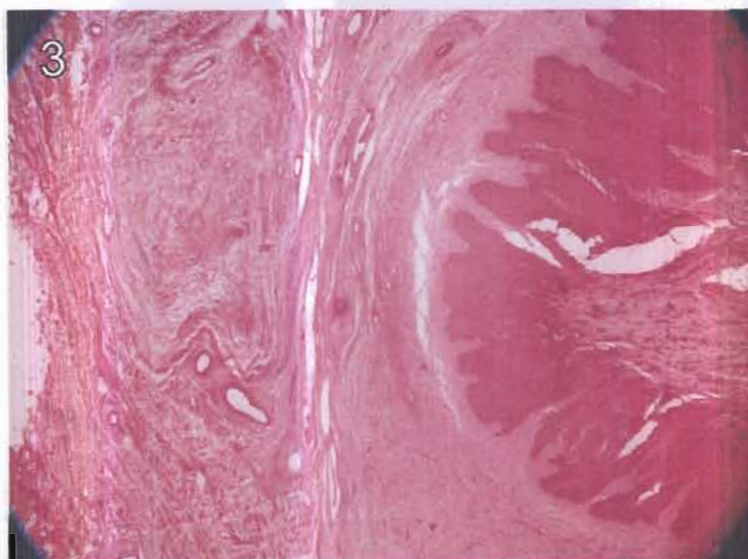


Fig.3. Showing proliferation of the fibrous C.T. of the dermis. HEX10

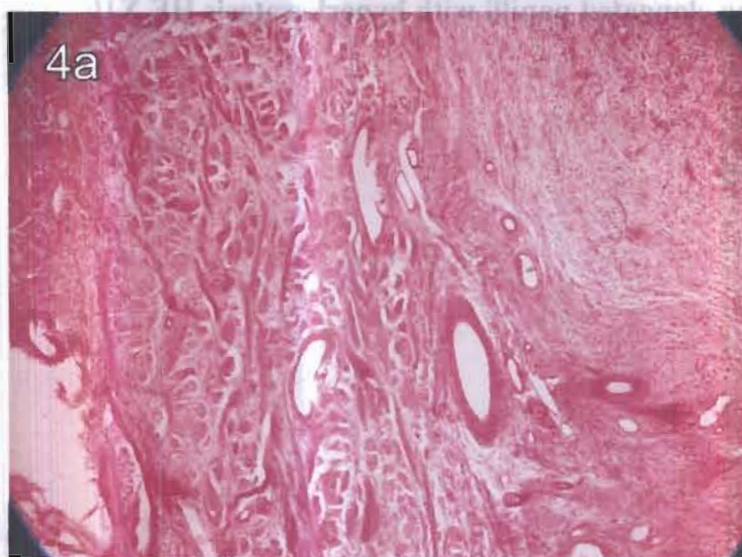


Plate2:-

Fig.4a. Showing wide and irregular blood vessels in the dermis HE X4.

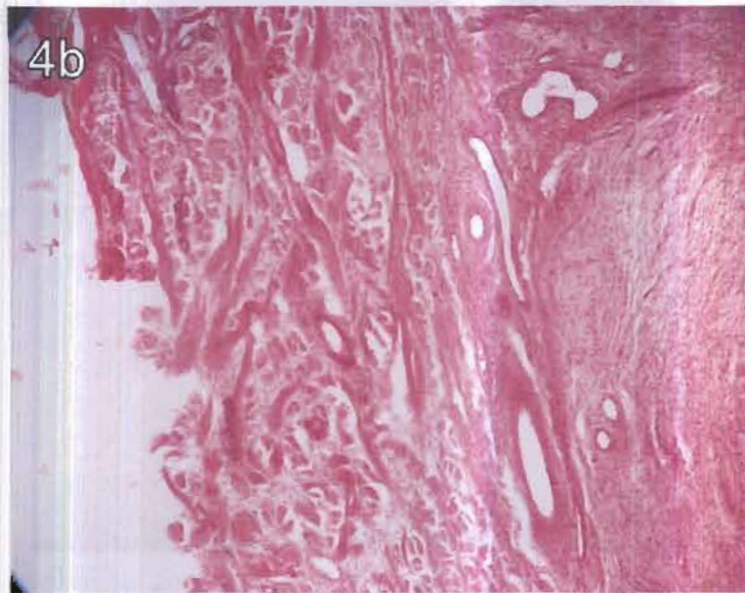


Fig.4b. Showing wide and irregular blood vessels in the dermis. HEX25.

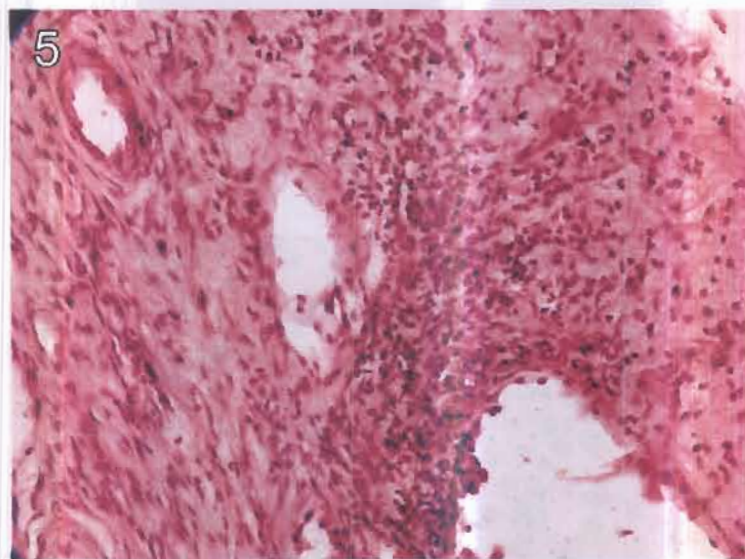


Fig.5. Showing lymphocytic infiltration around the dermal blood vessels (non purulent vasculitis) HE X 25.

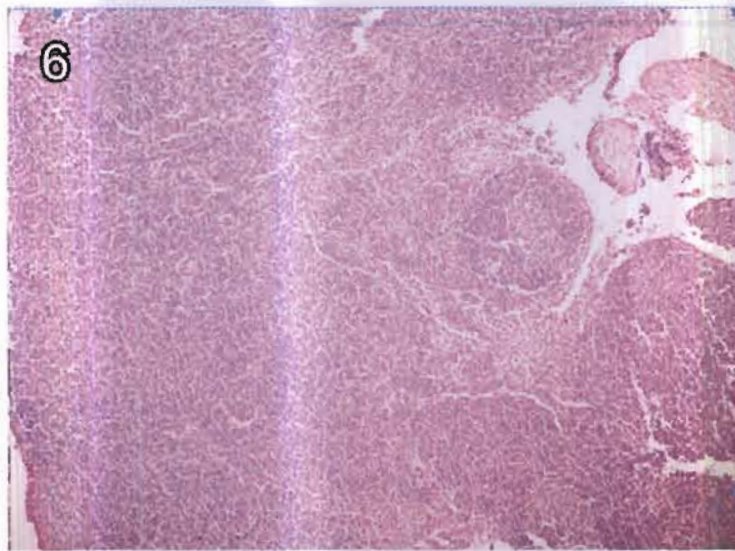


Plate3:-

Fig 6. Showing subcutaneous lymphoma with follicular distribution HE X10.

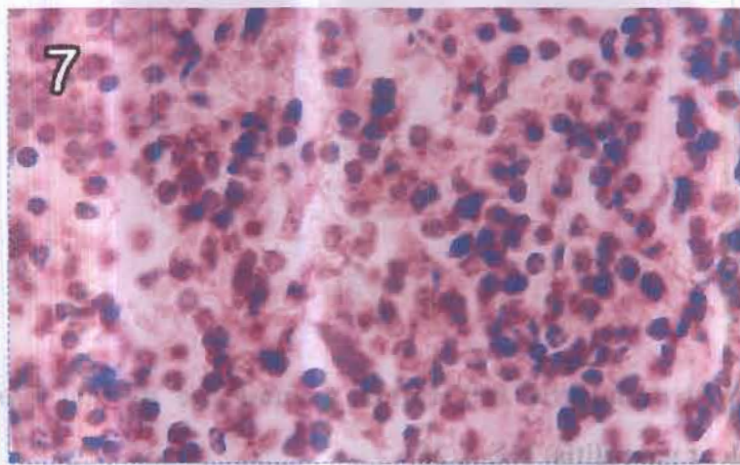


Fig.7. Showing higher magnification of lymphoma composed mainly of prolymphocytes HE X40.

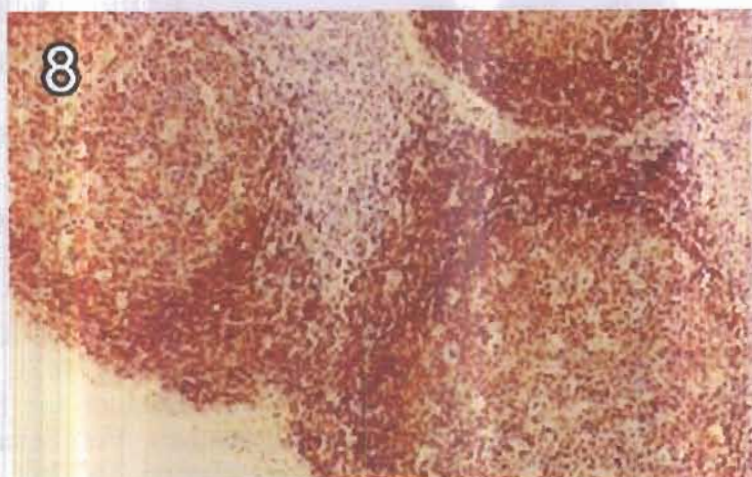


Fig.8. Section of formalin fixed paraffin embedded lymphoma showing dark uniform staining of cells through the lymphoid follicle. Avidin biotin peroxidase complex with Gills hematoxylin counter stain X25

DISCUSSION

The present study showed that, both infectious and non infectious papilloma are found in cattle more than 3 years old age. The cutaneous papillomatosis in bovine species affect cattle of all ages (5).

Grossly, both infectious and non infectious papilloma in the present study were elevated from the skin surface, pedunculated or cauliflower in shape and spread all over the animal specially on the back, chest, in the cervical region and neck region. Cutaneous papilloma is common in cattle at any location single or multiple, wart like in shape and some are pedunculated (15, 16).

Microscopically, in the present study, the cases of non infectious papilloma showed hyperkeratosis with acanthosis and the cells of the stratum spinosum showed vacuolar degeneration. The cutaneous papilloma in cattle in the previous researches was characterized by papillary projections of epithelium which is thickened by hyperkeratosis and acanthosis (4,9, 17). The continued trauma is important contributors to the neoplastic transformation of the skin component, which is the end result of a series of events causing damage to the cellular DNA, and increasing cell turnover which in turn

increase the chance of mutations (9). Two cases showed cavernous hemangioma in the dermis as the blood vessels were more wider, increased in number and irregular in shape. Cavernous hemangioma were distinguished by the formation of large cavernous channels and often occurred on the skin and mucosal surfaces of the body (18).

The cases of infectious papilloma in the present study were characterized by increase number of papillae with intense hyperkeratosis. Infectious papillomata in cattle consisted of elongated epidermal papillae covered with hyperkeratotic epidermis (4). The present cases of infectious papilloma showed connective tissue proliferation in the dermis with fibrocytes of different size and shape. The same picture is also founded in previous studies (16, 19) The blood vessels in the dermis showed non purulent vasculitis with focal and diffuse lymphocytic infiltration. The cutaneous papilloma in cattle which had been reported (7) was characterized by non purulent vasculitis, thrombus formation with infiltration of the dermal connective tissue with lymphocytes.

The subcutaneous lymphoma in the present study occurred in two year old cattle. The later finding was in contrast with the opinion that the lymphoma in general usually occurs in the

later life (16). Grossly, the lymphoma appeared as pea-shaped nodules under the skin in the chest and neck. Although, the available literatures concerning with the lymphoma in cattle are so rare, we can considered that the subcutaneous lymphoma is of high importance since it may accompanied with systemic involvement. This opinion may be intensified by the record which had been reported that this neoplasm derived from cells of the lymph reticular system and may be confined to the lymphoid tissue or spread to other tissues particularly the skin (12). The later authors considered the bovine leukemia virus as the cause of lymphoma in two cows.

The immunostaining indicated that subcutaneous lymphoma consisted of B prolymphocytes. The non Hodgkin's lymphoma are divided into T, B cells, histocytes and U cells where the B cell types lymphoma is the most common one (16,20). The follicle was consisted of basophilic cells, large in size than normal with irregular chromatin. The tumor cells in the lymphoma varied in size mainly atypical, large in size with vesicular nucleus (12). This variation in size of these lymphocytes with their vesicular nucleus indicated that most of cells were poorly differentiated (prolymphocytic) as it was founded that the poorly differentiated lymphocytic lymphoma consisted of medium to large sized lymphocytes with irregular nucleus (11,18,21).

It was concluded that bovine cutaneous neoplasms resembles 20% in cattle in Assiut governorate where the infectious and non infectious papilloma in percentage of 50%, 45% respectively, the subcutaneous lymphoma was founded in low percentages 5%. Grossly we can not differentiate between infectious and non infectious papilloma while microscopically the infectious papilloma characterized by non purulent vasculitis with severe dermal lymphocytic infiltration. The subcutaneous lymphoma grossly was as pea-shaped nodules under the skin on the neck and chest and characterized microscopically by presence of large size poorly differentiated lymphocytes in follicular distribution.

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الملخص العربي

دراسة باثولوجية على أورام الجلد وتحت الجلد في الماشية في محافظة أسبوط

إبراهيم احمد فؤاد عبد الرازق ، نيفين عبد الغنى النسر

تصف هذه الدراسة بالتفصيل ظاهريا و ميكروسكوبيا أورام الجلد واورام ما تحت الجلد. لذلك تم فحص ١٠٠ عجل تسمين خلال فحص ما قبل الذبح في مجازر محافظة أسبوط. لوحظت الأورام الجلدية والتحت الجلدية في ٢٠ حيوان من هذه العجول. تم أخذ عينات من هذه الأورام بعد ذبح الحيوانات لتجهيزها للفحص الهستوباثولوجي والفحص المناعي الهستوكيميائي. صنفت هذه الأورام الى ورم جلدي حليمي غير معدى (٤٥%) وورم حليمي معدى (٥٠%) وورم ليمفاوي جلدي (٥%). لوحظت الأورام الجلدية الحليمية في منطقة الضرع والصدر والرقبة وظهرت كثافة صلبة ذات عنق فوق سطح الجلد. أما ورم تحت الجلد الليمفاوي فظهر كجسم صغير في حجم الفول تحت الجلد في أماكن متفرقة من جسم الحيوان. أظهر الفحص الميكروسكوبي لقطاعات أورام الجلد زيادة في الكيراتين وتغيرات الجلد الشوكية وزيادة في تكوين النسيج الضام في كلا النوعين من الأورام الحليمية ولكن أظهر النوع المعدى التهاب غير صديدي للأوعية الدموية مع تداخل للخلايا الليمفاوية. يتكون ورم تحت الجلد الليمفاوي من خلايا زرقاء كبيرة تحتوي على نواة كبيرة تحتوي على تجمعات غير منتظمة للكروماتين. أظهرت الصبغة المناعية لقطاعات هذا الأورام ايجابية التفاعل لمميز الخلايا الليمفاوية الحويصلية.