

Studies on Cutaneous Tumors with Special Reference to their Surgical Interference in Equine

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Summary

The purpose of the present study was to investigate equine cutaneous tumors that admitted to the clinic of the Faculty of Veterinary Medicine, Moshtohour, Benha University. A total number of sixty four cutaneous equine tumors were recorded during a period from March, 2003 to January, 2007. Forty nine cutaneous biopsies were surgically excised from these masses and examined histopathologically. Out of these cutaneous masses, benign tumors were recorded in 54 cases (84.4%). Sarcoids were the most commonly diagnosed skin tumors (24 cases) that represented (37.5 %) of all of the recorded cases. Thirteen fibromas (20.3 %), 11 papillomas (17.2%) and six melanomas (9.4 %) were also recorded in this study. Malignant neoplasms (15.6 %) that represented by six squamous cell carcinomas, (9.4 %), two melanosarcoma (3.1 %) and two fibrosarcoma (3.1%) were also identified. The macroscopic and microscopic pictures of each tumor were described in details.

Introduction

Cutaneous tumors have been reported to represent up to 50% of all equine neoplastic diseases^{8,29,30}. Sarcoids, squamous cell carcinoma, melanocytic tumors, papillomas, and mast cell tumors were the most common recorded cutaneous neoplasms among equine^{8,16}. Sarcoid is a worldwide unique locally aggressive fibroblastic skin tumor of the horse and representing up to 90% of skin tumors and 20% of all tumors in equine¹⁸. Successful management remains a challenge, with a wide variety of treatment options, which still include complete surgical excision^{12,28}.

Squamous cell carcinoma (SCC) is a slow-growing malignant neoplasia of the skin. Untreated cases of SCC may invade local soft tissues and metastasize to the regional lymph nodes and internal organs⁹. Cutaneous papilloma is considered the most common tumor in horses between 1 and 3 years of age. They affect various cutaneous sites, as well as oral, ocular, and genital mucous membranes²⁴. Melanomas represent 6–15% of the reported cutaneous tumors in horses with an incidence of at least

80% in aged gray horses and their predilection sites are mainly the perineal and tail regions^{10,22,25}.

The aim of this study is to highlight the most common cutaneous tumors in Equine at Kaluobia Province and to identify the most common prevalence sites. Further aim is to follow up of surgical management of these tumors.

Material And Methods

A total number of sixty four equine cutaneous masses had been recorded in the period from March, 2003 to January, 2007, in the clinic of Veterinary Surgery at Moshtohor, Egypt.

The animals were premeditated with Diazepam* in a dose rate of 0.1-0.3 mg/kg b.w intramuscularly or intravenously. Excision of the masses was performed under the effect of chloral hydrate narcosis (Five gram/50 kg b.w. 10% solution injected intravenously) and local infiltration of 2% lignocaine Hcl solution. Hemorrhage was controlled with electrocautery, pressure and/or ligation. The follow up of these cases was carried out for a period of three months.

Tissue specimens of the excised masses were fixed in 10% neutral buffered formalin, dehydrated through graded ethyl alcohols, cleared in xylol and embedded in paraffin for routine histopathological examination. Thin paraffin sections of about five microns thickness were prepared and stained with hematoxylin and eosin stain².

Results

The incidence of the different cutaneous neoplasm among equine was tabulated in table 1.

Cutaneous papilloma was recorded in 11 cases (4 horses and 7 donkeys) ranged in age between 2-4 years old. The swellings

* Neuril® (Diazepam), Memphis Co. For Pham.& Chemical Ind. Cairo-A.R.E

were appeared grossly as a single large irregular mass or multiple raised small cauliflower like growth with either a smooth or irregular surfaces. These masses were either single large masses up to 5 cm in diameter or multiple diffuse small lesions of about 0.5-1 cm in diameter (Fig 1). The

face, neck and distal extremities were the most common sites for these growths. Four cases of these lesions (One horse and three donkeys) were disappeared spontaneously after 6-8 weeks without surgical interferences. In the other seven cases, the masses were surgically excised without recurrence after 2 months of follow-up.

The microscopic examination of such neoplastic growths revealed great thickening of the epidermal layer due to proliferation of the prickle cells and hyperkeratosis (Fig 2). The rete pegs of the epidermis invaded the underlying dermis forming finger like projections without breakdown of the basement membrane of epidermis. Moreover, the dermal core consisted of fibrous connective tissues with numerous thin walled blood capillaries that were also recorded.

Table (1): Distribution of the encountered equine cutaneous tumors.

Types of tumors	Horse	Donkey	Mule	Total	Percentage
Benign					
Papilloma	4	7	-	11	17.2
Fibroma	3	9	1	13	20.3
Melanoma	3	2	1	6	9.4
Sarcoid	5	16	3	24	37.5
Total	15	34	5	54	84.4
Malignant					
SCC	2	3	1	6	9.4
Melanosarcoma	2	-	-	2	3.1
Fibrosarcoma	-	2	-	2	3.1
Total	4	5	1	10	15.6
Total of recorded tumors	19	39	6	64	

Fibroma was diagnosed in thirteen cases (3 horses, 9 donkeys and a mule) and represented grossly by the presence of single, irregular, lobulated, firm, mostly ulcerated mass over the area of pectoral muscle, distal extremities of the limb (Figs 3&4), inner aspect of the thigh, and lower right flank. These masses were surgically excised without recurrence after 2-3 months of follow up. The cut section of such neoplastic masses showed grayish reddish areas. Moreover, in one case, a single hard mass was noticed at the medial aspect of the leg.

The microscopic findings of the excised neoplastic masses were characterized by the presence of well developed bundles of connective tissues varied in arrangement usually interlaced and whorled together (Fig 5). These bundles formed from mature fibroblasts, which relatively larger and had hyperchromatic elongated nuclei with thin wavy loosely arranged collagen fibers. The neoplastic parenchyma was divided into many lobules with thin connective tissue septa and enclosed by connective tissue capsule. In some cases, the superficial epidermal layers were ulcerated and the stroma of the neoplasm was infiltrated with inflammatory cells mainly neutrophils, lymphocytes and macrophages. Moreover, in one case, which diagnosed as an ossified fibroma, focal areas of calcification and aggregation of ossified plates were found through the neoplastic parenchyma.

Melanoma was reported in six cases (Three horses, a mule and two donkeys) ranged in age between 9-12 years old. The neoplasm appeared macroscopically as well circumscribed blackish slightly firm mass on the lower aspect of the neck and ventral abdominal wall (Figs 6&7). These masses were surgically removed without recurrence.

Microscopically, the neoplastic cells were polyhedral or rounded in shape and filled with brown granules of melanin which obscure their structures (Fig 8). Moreover, some of these melanin pigments were also observed outside the cells and aggregated in the dermal connective tissues.

Sarcoids were recorded in twenty four cases (5 horses, 3 mules and 16 donkeys). Twelve cases were single fibroblastic type, seven cases were verrucous type and the remaining five cases were mixed type comprised of fibroblastic and verrucous types. Grossly, the fibroblastic type of the recorded equine sarcoids appeared as single circumscribed lobulated firm nodules mainly on the skin of scrotum, the limbs and medial canthus of the eye (Figs 9,10, 11 &12). The Verrucous sarcoids were evidenced by highly keratinized cauliflower mass mainly on the legs and face (Figs 13 & 14) In one cases of the verrucous type the neoplasm appeared as multiple masses of variable sizes arouse from the medial canthus of the eye (Fig 15). The mixed type was formed from multiple small elevated firm nodules and horny irregular masses with absence of hairs on affected skin.

Surgical excision was curative in most of the cases (19 cases), while recurrence was detected in one cases which necessitated re-excision. In one

donkey, there was no any surgical interference because of the lesion was expanding , diffuse and extended to the subcutaneous tissues around the eye. Follow up could not be performed in the other 3 cases.

Microscopically, hyperplastic proliferation of the dermal fibroblasts and thickening of the overlying epidermis due to hyperkeratosis and acanthosis with extended epithelial pegs deeply into the underlying dermis. This microscopic picture was prevalent in most of the examined sarcoids particularly those arise from the legs. The neoplastic fibroblasts were spindle in shape and had elongated nuclei and arranged in tangled and whorled pattern (Fig 16).

Squamous cell carcinoma was recorded in 6 cases (2 horses, a mule and 3 donkeys). This neoplasm was originated from the eye lids (4 cases) (Fig 17) and from the vulva and preputial orifice (2 cases) (Fig 18). The recorded neoplasm appeared as well vascularized lobulated masses that were mostly ulcerated. The masses were surgically excised without recurrence within 3 months postoperatively.

Histopathological examination of these masses showed characteristic epithelial pearls within the dermal connective tissues. These epithelial pearls were formed from central lamellated or homogenous strongly acidophilic hyaline cores surrounded by several layers of concentrically arranged neoplastic cells (Fig 19). The neoplastic cells were pleomorphic but mostly polyhedral at the periphery and became compressed and fattened toward the centers. In addition, these neoplastic cells showed hyperchromatic and/or large nuclei with enlarged nucleoli and numerous mitotic figures. Moreover, focal areas of hemorrhage, necrosis and mononuclear inflammatory cellular aggregation in the neoplastic parenchyma were also observed particularly in ulcerated neoplasm.

Melanosarcoma was observed in two horses and represented grossly in one case by the presence of multiple blackish masses of variable size on the ventral aspects of the tail (Fig 20). Follow up of this case revealed death of the horse after two months. Postmortem examination revealed the presence of extensive metastasis into the internal organs particularly liver and lungs. In the second horse, the neoplastic mass appeared single blackish swelling on the area of os coxae (Fig 21) and surgically removed without recurrence.

Histopathologically, melanoma was formed from polymorphic neoplastic cells which mostly large in size, polygonal in shape and had oval hyperchromatic nuclei and basophilic cytoplasm. Some of these neoplastic cells contained few brown granules of melanin within their cytoplasm (Fig 22). Moreover, these cells were closely arranged in sheets, cords and irregular masses of variable size and held by thin fibrous connective tissue septa.

Fibrosarcoma was detected in two donkeys and represented grossly by irregular non capsulated firm large grayish- red area on the limb and neck (Fig 23) . The cross section of the neoplastic mass revealed irregular reddish areas.

Histopathologically, the neoplasm was formed from bundles of immature fibroblast and collagen fibers running in various direction and interlaced with each other . The neoplastic cells were pleomorphic but they mainly fusiform with oval or elongated hyperchromatic nuclei and numerous mitotic figures (Fig 24). Moreover severe congestion with focal areas of hemorrhage, necrosis and mononuclear inflammatory cellular infiltration were detected.

Discussion

Despite cryosurgery, hyperthermia, radiation chemo-therapy and laser surgery have very effective and appreciated results in the treatment of cutaneous neoplasia and recommended by many reports^{5,8,14,15,16,19,32}. Sharp surgical excision remains the most available procedure for management of such cases in the field situation by practitioners.

The present investigation was carried out to illustrate the most common cutaneous tumors in equine at Kaluobia province and the outcomes of the surgical interferences of these cases. The results of this study indicated that the benign neoplasms (84.4 %) were more prevalent than malignant ones (15.6 %) in equine. This result agrees with that recorded in other reports^{26,30}, who stated that more than 90% of equine cutaneous tumors are benign at the initial presentation.

The highest recorded benign masses in this study were sarcoids (37.5%), while the lowest ones were melanomas (9.4 %). This might differs from that previously recorded⁶, who reported that melanoma is the most common tumor in most of the domestic animals and represented 27% of the total recorded cases.

The recorded malignant masses in this study were six squamous cell carcinomas (9.4 %), two melanosarcoma (3.1 %) and two fibrosarcoma (3.1%). This incidence is similar to that reported in another studies ^{8,16}.

The seven papillomas recorded in this study were seen in young aged animals (from two to four years). This is in agreement with another studies that reported papillomas to affect mainly young animals ^{21,23,31}. The diagnosed equine papillomas were characterized grossly by presence of single and/or multiple cauliflower masses around the nostrils, face and on the ventral aspect of the abdomen. Spontaneous recovery was recorded in four cases of the recorded papillomas within 2 months (17.2 %). These cases were mainly that ones with small clusters of masses. These results were in a harmony with that previously mentioned ^{7,21}.

In the present investigation, 11 cases were diagnosed as fibromas (20.3%), that were mostly ulcerative in nature and appeared grossly as single irregular firm mass. Similar picture was also mentioned in previous works ²⁴. The high incidence of fibromas might agree with other reports ¹. Moreover, in the present study one case of the recorded fibromas was diagnosed as ossifying fibroma and characterized by presence of spicules of osteoid tissues within the neoplastic parenchyma. Nearly similar findings were also recorded in other studies ^{4,17,20}.

Squamous cell carcinomas were recorded in 6 cases (9.4 %) and appeared grossly as a well vascularized lobulated ulcerated masses originated from both eye lids and vulva. These results came in accordance with the previous reports ^{5,30}.

In this study, six melanomas were recorded (9.4%). All of these masses were seen in aged animals (9-12 years old). This result agrees with other studies that stated the risk of melanomas increases in horses over than 6-10 years ^{13,16}. Two cases of cutaneous neoplasm were diagnosed histopathologically as malignant melanosarcoma and appeared as multiple blackish masses ventral aspect of the tail and the abdomen. One of these two cases died after 2 months. The postmortem examination revealed extensive metastasis into the internal organs particularly the liver and lung. This result might in agreement with other reports that demonstrated the malignant melanoma can be metastasized by lymph channel and blood ^{10,13,25}.

Equine sarcoids were mostly of mixed type including nodular and varrucous sarcoids. These masses represented grossly by single and/or

multiple growths of different size mainly on the ventral aspect of the abdomen, legs, medial canthus of eyes and scrotum. Similar findings were also previously recorded^{11,27}. The growth appearance of sarcoid was greatly similar to fibromas so, it must be differentiated histopathologically. Sarcoids were the most frequently observed tumors along this study. It represented 24 cases (38.7%) of the recorded cases. This result was in agreement with another reports in horses³.

The results of this study indicated that the incidence of the recorded benign neoplasm was in general higher than the malignant ones and the equine sarcoids followed by fibroma, papilloma and melanoma were the commonest recorded neoplasm in the skin of the examined horses and donkeys.

The results of this study suggest that, effective treatment of skin tumors might be due to the unique ability of their early diagnosis. While, skin tumors are more amenable to surgical excision than other types of tumors which arise from other deeper sites, some complications as recurrence and/or metastasis might complicate the effective management.

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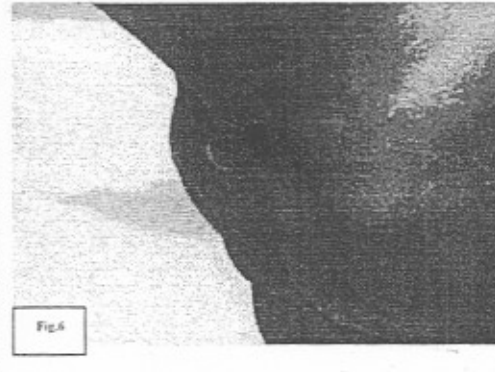
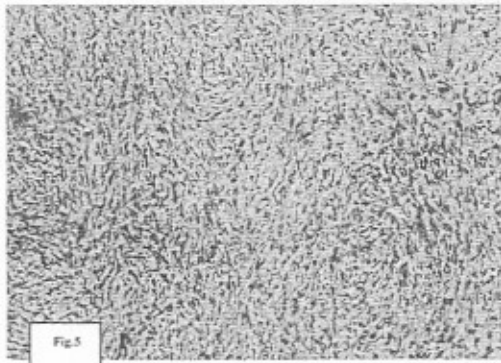
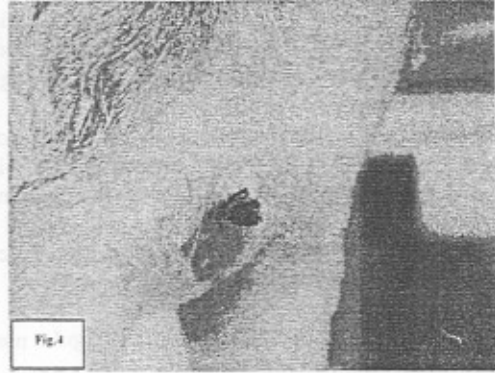
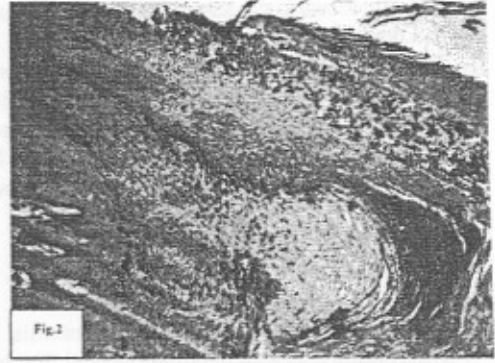
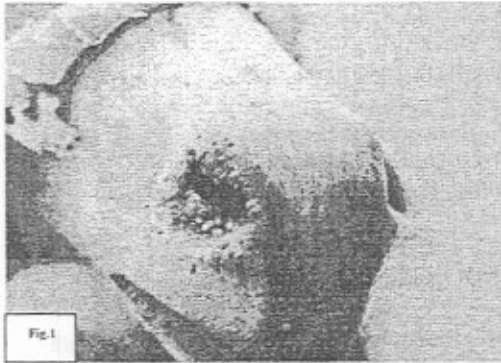
Fig (20): Multiple melanoma (melanosarcoma) appear as multiple blackish masses of variable size on the ventral aspects of the tail in a horse.

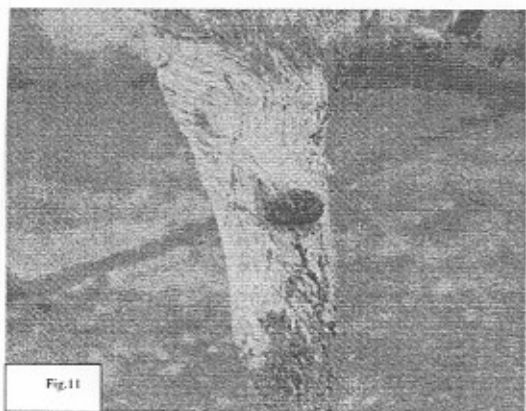
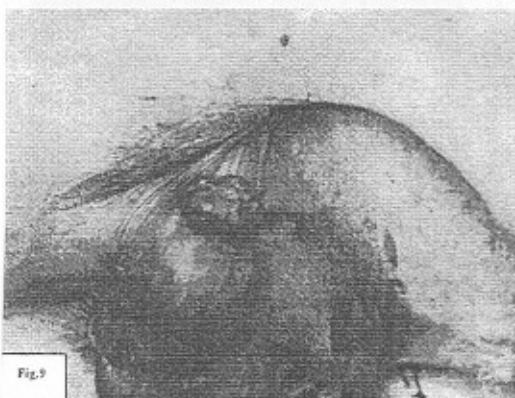
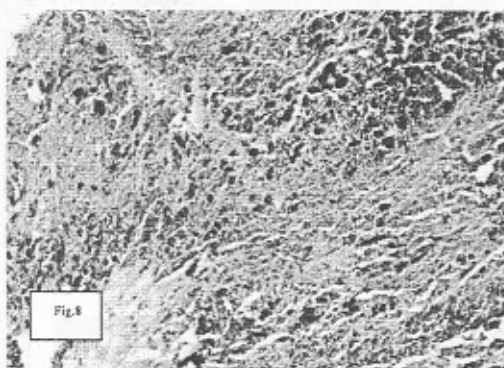
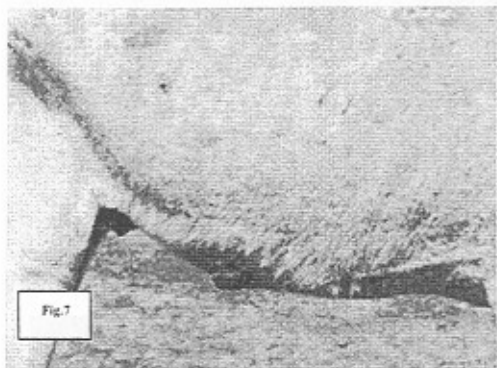
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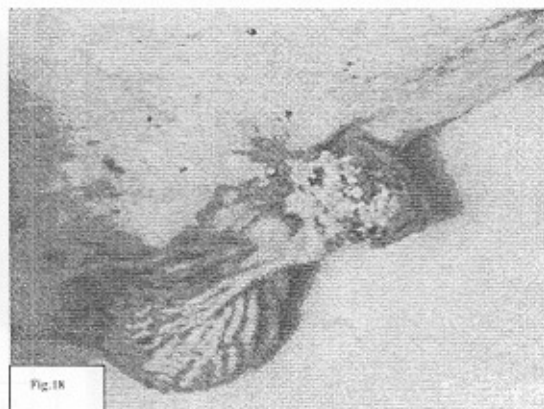
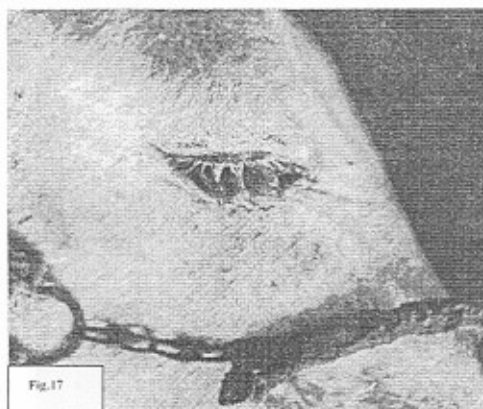
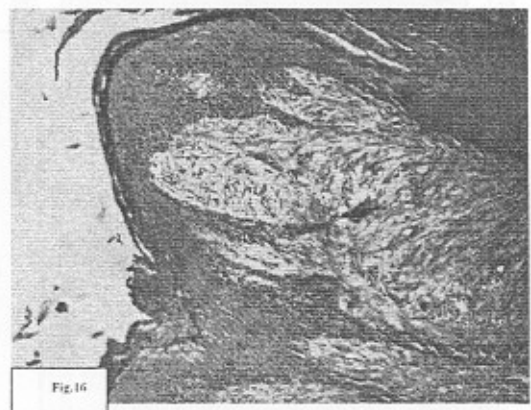
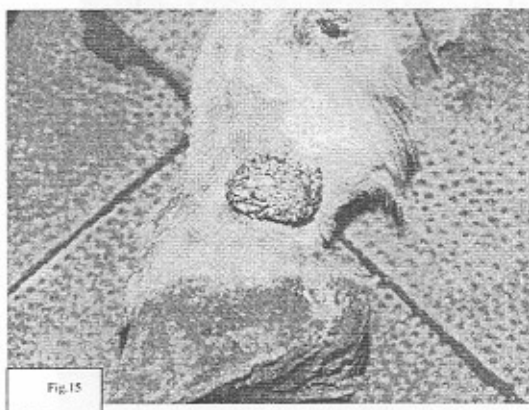
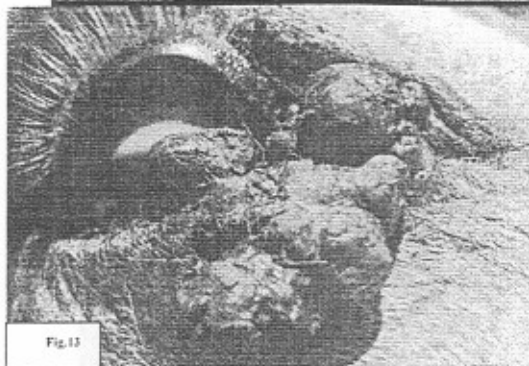
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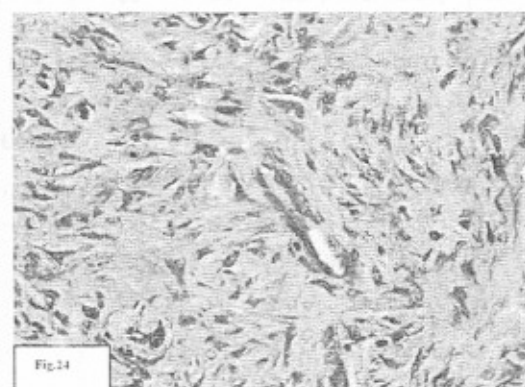
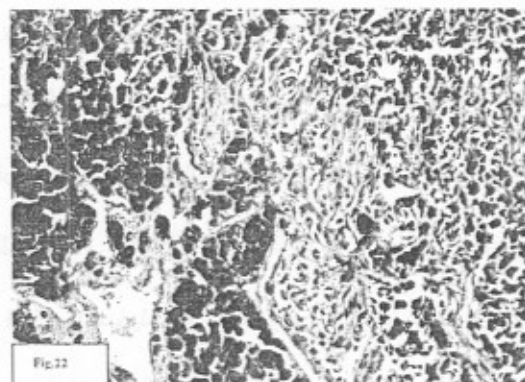
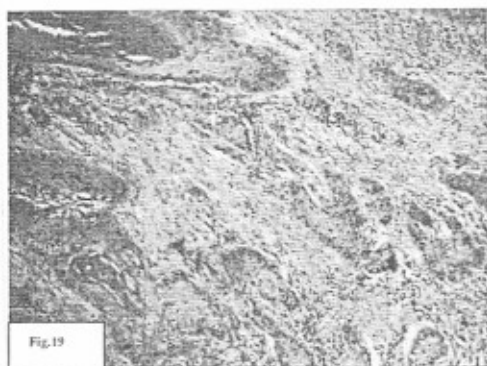
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دراسات على الأورام الجلدية مع الإشارة إلى التدخل الجراحي لها

فى الفصيلة الخيلية

د. عادل الأقرع ١ أ.د. أحمد طنطاوى ٢

قسم الجراحة ١ وقسم الباثولوجيا ٢ كلية الطب البيطرى- جامعة بنها

استهدفت هذا البحث دراسة بعض الأورام الجلدية فى الفصيلة الخيلية حيث تم تسجيل عدد ٦٤ حالة من الحالات الواردة لمستشفى كلية الطب البيطرى- جامعة بنها فى خلال الفترة من مارس ٢٠٠٣ وحتى يناير ٢٠٠٧. أظهرت الرسالة أن الأورام الحميدة مثلت نسبة ٨٤,٤% وقد صنفت على النحو التالى (شبيه الأورام اللحمية ٣٧,٥%، الأورام الليفية ٢٠,٣%، الأورام الحليمية ١٧,٢%، الأورام الميلانينية ٩,٤%) بينما بلغت نسبة الأورام الخبيثة ١٥,٦% وصنفت على النحو التالى (الأورام السرطانية القشرية ٩,٤%، الأورام الميلانينية الخبيثة ٣,١% و الأورام الليفية الخبيثة ٣,١%). أجرى التدخل الجراحي فى ٤٩ حالة من الحالات المذكورة وتم فحص وتوصيف العينات عينيا ومجهريا.