EXTERNAL EAR AMPUTATION FOR TREATMENT OF SOME UNUSUAL SURGICAL CONDITIONS IN BUFFALOES

BY

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ABSTRACT

Surgical affections of the external ear in case of large animals, specially cattle and buffaloes are rarely occurred in relation to other animal species. The present study is dealing with four cases of external ear swellings and three cases of incurable wounds in buffaloes. The clinical, and histopathological examinations of these swellings revealed that three of them were Squamous cell carcinomas, while the last one was a hypergranulation tissue formation with maggot infestation. These cases represent the first repoted occurance of a SCC arising from the external ear in buffaloes. Chronic irritation and wounds, following the misuse of tethering rope as a mean of buffaloes control was incriminated as the main cause of these conditions. Auricular amputation was carried out successfully without any complications in all treated cases.

INTRODUCTION

Water buffaloes are still to be an integral part of the animal population in Egypt due to the fact that they are often farmed in adverse environment, more resistant than cattle to many diseases, and provide invaluable services and products to farmer. Despite the fact that ear diseases, are not often considered surgical cases, they do constitute an important portion of large animal practice (Guard 1953 and Frank 1964).

Although squamous cell carcenoma (SCC) is comparatively common in cattle, the recording of this condition in the external ear of buffaloes does not exist in the available literatures. With regard to the incidence of Squamous cell carcenoma and sites among domestic animals, Cotchin (1960), Anderson et al (1969), Jenninges (1984) and Jubb et al (1993) explained that SCC is more common in the eye and ocular adenexa than the skin of cattle and horse, while Moulton (1978) explained that this condition has a breed predisposition and accompanies cutaneous papillomas of the udder and teats in Saanen milk goats. Pully and Stannard (1990) and Jubb et al (1993) mentioned that there is some other cases usually occur in the valve of cattle, goats, and recently sheared sheep. Ismail (1994), during a survey on some external ear affections among domestic animals, recorded 3 cases of ear SCC in sheep, and added that tumors of the external ear were mainly papillomas or warts and rarely.. chondrosarcoma and SCC. Cotchin (1960), Moulton (1978), Jubb et al (1993), Meleo (1993) and Karelle (1997) found that there is a tendency of SCC to devlop in certain areas of unpigmented skin such as the pinna and nasal planum. Squamous cell carcinoma occurring at the base of the horn, was first reported in aged Zebu cattle. After the horn is removed, a cauliflower-like growth was observed in the horn core. Histopathological examination of specimens from

the affected tissues revealed carcinoma without metastasis in any other part of the body (Hewlett 1905, Kulkarni 1953, Lall 1953, Petera 1959 and Naik et al 1969).

The chief cause of SCC is unknown, but Jones (1997) estimated that there is a relationship to solar irradiation with the occurrence of SCC of the eyelid in cattle, and the skin of the pinna. Additionally, with regard to SCC of the horn in cattle, Lall (1953), Naike et al (1970) and Moulton (1978) mentioned that there were some initiating factors, such as paring of the horns and their consequent exposure to actinic rays, trauma due to the striking of the horns by the yoke while ploughing, and the castration of the bulls at early age. Besides the sun light, Jubb et al (1993) mentioned that there is support for the influence of epidermal injury in the initiation of squamous carcinomas at sites of ear notching, branding, and perhaps, chronic inflammation.

Traumatic coetaneous myiasis occurs at the genital orifices, interdigital space, edges of wounds, ear and the eye of the animals (Berttina 1988 and Frakas et al 1997). Rodrigez and Perez (1996) and Frakas et al (1997) described the clinical signs of the condition as moderate to severe bleeding, and serosanguinous exudates spilt freely over the edges of the lesion. Moreover they find that the surrounding skin was tense, hot to the touch and sometimes edematous; besides, suppuration in the wounds free of larvae with the presence of unpleasant odor.

Guard (1953) and Frank (1964) classified the surgical procedures of the external ear of large animals as elective, which is for the benefit of the owner and non-elective, which is for the benefit of the animal primarily. Meanwhile they stated that surgical treatment of large animal's ear should be performed as quickly as the necessity for surgery is recognized. After liberal excision of the external ear neoplasms, Boyd and Titus (1990) find that the appearance of the ear may be esthetically undesirable in many cases. Regarding treatment of SCC Lall (1953), Petera (1959) and Naik et al (1969) find that the chance of success are bright by removal of cancerous tissue, firing and dressing the wound with strong antiseptic agents.

The present study through the light on unusual cases of SCC, myiasis, and incurable wounds of the external ear in buffaloes.

Materials and Methods

During the period from 1992 to 1996, seven buffaloes were admitted to Veterinary Teaching Hospital, Faculty of Veterinary Medicine at Moshtohor for the presence of swellings and old wounds of the external ears.

All affected animals were sedated via intra-muscular injection of xylasine Hcl 20% (xylapin)* 0.25ml/100kg body weight for careful clinical examination with special attention for the external ear lesions.

In case of the presence of swellings, biopsies were taken via a wide-needle biopsy from two cases and specimens were taken from the rest of the cases after their surgical treatment for histopathological examination. The tissues were fixed in 10% buffered neutral formaline, and then processed for paraffin section in the usual way and sections were stained with haematoxylin and eosin.

Amputation of the external ear was performed in six cases, while the affected animals restrained in the lateral recumbence position. The base of the external auditory meatus was packed with sterile gauze and a tourniquet was placed as away as possible from the base of the swelling.

After routine surgical preparation of the ear and surrounding area, 2% lidocaine* was applied as a ring block infiltration analgesia behind the tourniquet toward the base of the ear.

The affected pinna was suspended with a traumatic forceps. Two parallel skin incisions were made in the healthy skin about 2cm away from the base of the swelling. One incision was made in the outer "convex" surface, while the other one was on the inner "concave" surface of the pinna. Then both incisions were connected at both edges of the pinna.

After that the skin was retracted towards the base of the ear for about 1cm using blunt and sharp dissection. Soon after the dissection was performed another incision was made through the auricular cartilage and the remaining flap of skin used for covering the exposed edge of the cartilage. The skin edges were brought together with simple interrupted suture pattern using non-absorbable synthetic suture material, and then a stent bandage was applied (fig 4).

The post-operative care was in the form of local application of antibiotic ointment soon after suturing and 3 days intervals till sutures were removed after 10 days postoperatively.

RESULTES

In the present study, four buffaloes showed for the presence of swelling on one or both ears pinna and 3 cases of old cutting wounds. The age of the animals that found to be affected varied from 8 to 14 years. Table 1 presents the variation in age groups of the affected animals and more descriptions of the diagnosed conditions. Palpation of the regional lymph nodes revealed no signs of inflammation or metastasis.

SCC was unilateral in one case and bilateral in the other two cases (Figs 1,2,3,4&5). In the first case the left ear was affected and there was a circular depressed wounded area looked like a line of demarcation between the swelling and the healthy part of the ear. The swelling presented as exuberantly growing tissue, with multiple small cauliflowers like nodules, were mainly originated from the inner "concave" part of the pinna while the rest of the pinna was firm, and tense (fig 1). While the entire right ear pinna was destroyed and 2 different sizes swellings with clear line of demarcation were observed. The bigger one was in the size of a basketball occupying the apical part of the pinna, while the smaller one was in the size of a handball and located toward the base of the ear (figs 2&3). The swellings were heavy to the extent that the affected animal was unable to move its head freely. The surface of the swellings showed shallow and deep crusted ulcers, while the entire swelling was firm, cold and painless.

In the second case of SCC, that was the daughter of case number one, both ears were diffusely swollen but the skin was intact with the presence of small cauliflower nodule at the tip of the pinna. Manual palpation revealed the presence of firm nodules of variable size under the stretched skin (fig 4). Concerning the third case of SCC the right ear was only affected and the lesion was nearly represent that of the left ear in case number 1 (fig 5).

Histopathological examination of the first three cases showed typical microscopical lesions of SCC, while that of the last one revealed the presence of exuberant granulation tissue with scattered areas of necrosis and fibrosis. Sections of SCC revealed the presence of an irregular mass or cords of epidermal cells that proliferate downward and invade the dermis and subcutis with destruction of the basement membrane (fig 7). As a result of the well differentiation of the tumor a large number of "epithelial pearls" were presented and composed of concentric layers of squamous cells showing gradually increasing keratinization toward the center. Mononuclear cellular infiltration of the stroma particulary lymphocytes was also detected (fig 8).

With regard to the fourth case, there was an old lacerated cutting wound 5-7 cm away from the base of the ear. The wound presented an exuberantly growing tissue and infested with maggots (fig 9). The apical part of the pinna was swollen, inflamed and showed scattered areas of necrosis and scares.

The rest of the cases represented variable degrees of old cutting wounds (Figs 10&11&12) and all wounds were observed over the areas used to tie the tethering rope as a mean of control. The tips of the ears pinna showed necrosis and variable degrees of swelling.

Complete auricular amputation including the swelling was performed unilaterally in case number 3 with SCC, case number 4 with hypergranulation tissue and maggot infestation, and in cases number 5,6, and 7 with incurable old wounds. In case number 1 the amputation was performed to the larger swelling only of the left ear, while it was performed completely to the right one as requested by the owner, and he refused any surgical interference for case number 2. All cases recovered from surgery without any complications and metastasis during the follow up periods as shown in table 1.

DISCUSSION

An unusual form of SCC had been identified in five ears of three buffaloes. This condition is most likely to be in old ages and started at the inner aspect of the auricle, then invade the entire ear without metastasis in the regional lymph nodes. Naike et al (1969), Moulton (1978), Thomson and Diplomate 1988 also observed similar findings in case of horn SCC. Concerning the invasive character of this lesion, Scott et al (1993) referred that the external ear is very thin and devoid of subcutaneous fat, allowing rapid tumor penetration.

Like most neoplasms, the actual cause of auricular SCC is unknown but from the history of living of the affected animals out the full span of life and the clinical finding we can conclude that there is a direct relationship between chronic irritation, wounds of the external ears, and solar irradiation. Tying the tethering rope at the base of the ear to restrain the animal, not only causes wound and chronic irritation to the auricle, but also exposes the inner unpigmented aspect of the ear to sunlight. Regarding to cattle's horn SCC, Lall (1953), Petra (1959), and Naike et al (1969) proposed the same conclusion. Concerning the role of sunlight, Jubb et al (1993), and Jones (1997) explained that the solar energy directly stimulating the light absorbing molecules, chromophores, in the skin. The excitation of these molecules leads to removal of electrons, free radicals, which are extremely reactive and cause damage to the surrounding tissues.

Total auricular amputation was carried out successfully for treatment of all affected animals without any postoperative complications. Scott et al (1993) mentioned that the sooner diagnosis and surgical interference the better prognosis. Moreover, Jolle (1993) and Andrew (1995) reached to the same conclusion as the external ear neoplasms are more amenable to complete excision and have a better prognosis than those affecting the middle and inner ear.

Although there was a definite history of traumatic injury preceding the development of SCC of the ear pinna, we also like to draw attention to the presence of the condition bilaterally in two genetically related animals (dam and daughter). It is difficult to prove whether this bilateral involvement as a result of metastasis from one ear to another or from genetic predisposition. Also we found no evidence of multiple incidence, so our results suggest that auricular SCC is a purely sporadic disease, but many cases may misdiagnosed and confused with complicated wounds of the external ear. Moreover, the presence of this condition in females does not indicate sex predisposition, since most adult animals in these species are female.

We also found that the chronic irritation resulting from the tethering rope not only inflected in the presence of traumatic incurable old wounds but also predispose to maggot infestation and SCC formation. The location of the lesions in case of auricular myiasis as well as the clinical signs were not so far than that observed by Bertina (1988), Rodrigez and Perez (1996), and Frakas et al (1997). On the other hand, Naik et al (1969) diagnosed a similar maggot infestation in case of horn SCC and reported that the animal may die from emaciation and weakness within 4 to 6 months.

The significance of these cases is not only from the economic point of view but also because man and his domestic animals share a common environment. Anderson and Sandison (1969) had the same conclusion and explained that man may exposed to the same carcinogenic agents and the biology of cancer of animals used for food production is of obvious interest in relation to human cancer. Moreover, Georogoudis (1993) came to the same idea and added that buffaloes is not used only as a paramount source of meat, milk, leather and work in many of the world's marginal rural areas, but also is an insurance against environmental adversity which explains why people and animals live in such a close symbiosis

Therefore, further studies concerning the presence of ear SCC in buffaloes are required, and we would ask co-operation from the practicing veterinarians to provide more information and samples for examination contribute to the same condition.

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Table 1: Showing the distribution of ear lesion, age, and the fellow up periods of the treated animals.

Case number	Age	Lesions	Ear involvement	Amputation	Follow up
1	14	SCC	Bilateral	+	6 months
2	10	SCC	Bilateral	-------	----------
3	10	SCC	Unilateral	+	1 year
4	8	Myiasis	Unilateral	+	3 months
5	9	Wound	Unilateral	+	2 weeks
6	11	Wound	Unilateral	+	2 weeks
7	10	Wound	Unilateral	+	2 weeks

List of figures

Fig. 1: The left ear of 14 years old buffalo cow bilaterally affected with SCC. Note the cauliflower nodular appearance of the lesion and the circular wound at the base of the ear caused by the tethering rope.

Fig. 2 : The right ear of the same case in fig. 1, with the presence of two swellings the first in the size of a basketball, while the second in the size of handball. Note the presence of nodules, crusts and ulcerations on the outer surface of both swellings.

Fig. 3: The same case in fig 2 after surgical amputation of the bigger swelling, while the other one shows ulceration and erosion. Note the presence of the circular wound at the base of the ear caused by the tethering rope.

Fig. 4: Bilateral SCC of the ear in 10 years old buffalo cow. Note the nodular protrusions under the intact skin, while the tip of the ear shows necrosis.

Fig. 5: Unilateral SCC in the right ear of 10 years old buffalo cow. The lesion nearly resembles that of the case in fig 1.

Fig. 6: The same case in fig 3 after auricular amputation and stent bandage application.

Fig. 7: Squamous cell carcinoma of the ear showing presence of variable sized masses of concentrically arranged epidermal cells forming epithelial pearls. H & E stain X 400.

Fig. 8: Squamous cell carcinoma showing central keratinized epithelial pearls with mononuclear cellular infiltration of the stroma. H & E stain X 400

Fig. 9: The right ear of 8 years old buffalo shows the presence of a lacerated wound at the base of the ear caused by the tethering rope. Note the presence of tissue necrosis, hypergranulation tissue formation and "maggot" infestation.

Figs 10&11&12: For cases number 5,6 and 7 respectively show variable degrees of old incurable wounds in the external ears. Note the presence of necrotic areas and swellings of variable sizes (arrows).


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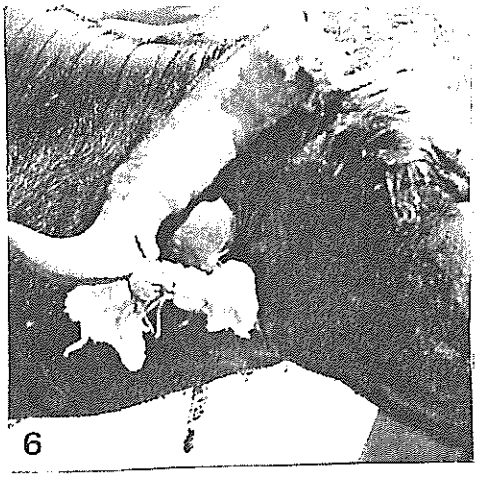
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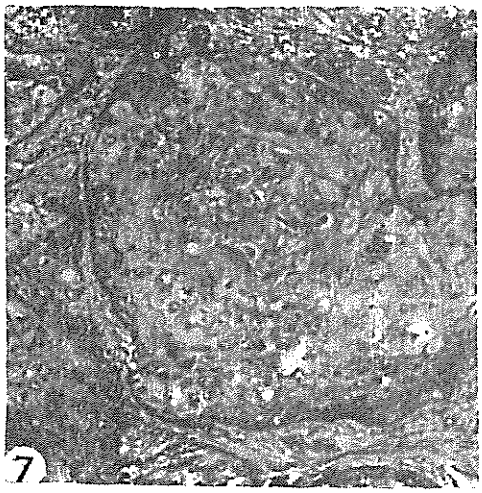
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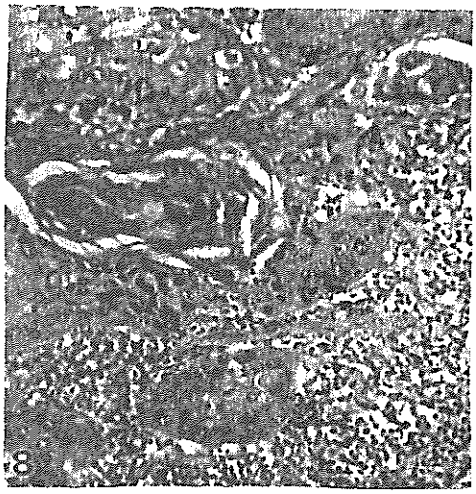
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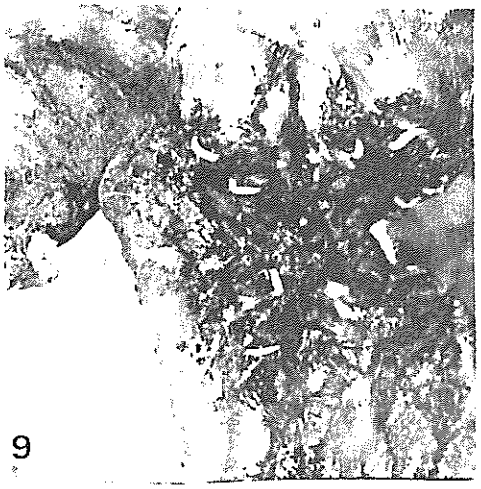
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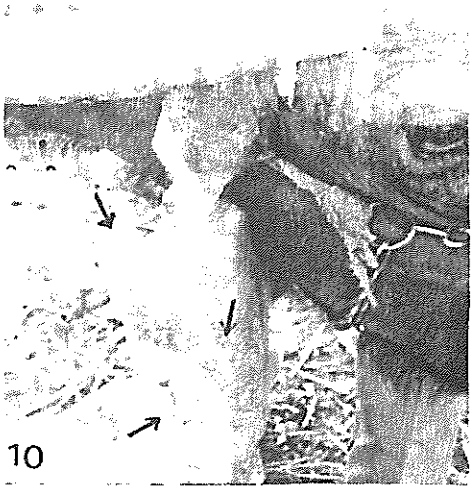
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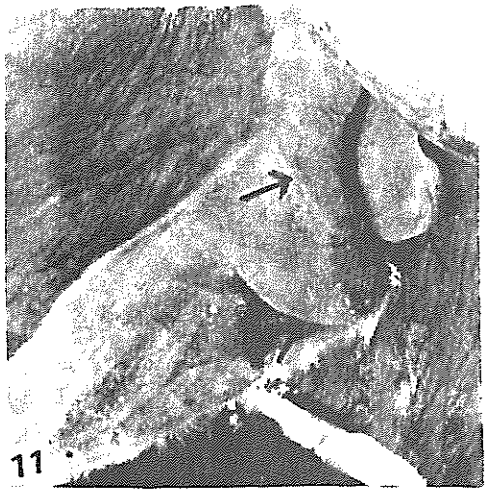
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الملخص العربى

استئصال الأذن الخارجية لعلاج بعض الحالات الجراحية الغير شائعة الحدوث فى الجاموس

أبو العلا و طنطاوى

تعتبر الاصابات الجراحية للأذن الخارجية نادرة الحدوث فى الحيوانات الكبيرة و خاصة الأبقار و الجاموس . و من الجدير بالذكر أن الجاموس يعتبر من أكثر الحيوانات ملائمة لظروفنا البيئية و كذلك يعيش على مقربة من الأنسان فى جميع القرى و لهذا تعتبر دراسة أى حالة مرضية للجاموس هامة من الناحية الأقتصادية و كذلك من الناحية الصحية للأنسان. و من خلال هذه الدراسة تم الفحص الأكلينيكى لسبع حالات و الهستوباثولوجى لاربعة منها و وجدت ثلاثة حالات كانت مصابة بأورام سرطانية حرشوفية خبيثة و الحالة الرابعة كانت مصابة بتدويد لجرح صوان الأذن أما الثلاث حالات الأخرى فكانت لجروح قديمة. و من الجدير بالذكر أن هذا يعتبر أول تسجيل للسرطانات الحرشوفية الخبيثة فى الأذن الخارجية للجاموس. وقد وجد أن السبب الأساسى لحدوث مثل هذه الحالات هو الأستخدام السيىء بربط الحبال حول الأذن و القرن كوسيلة للسيطرة على الحيوان مما يؤدى الى حدوث ألتهابات مزمنة تكون عوامل مساعدة لحدوث السرطانات الحرشوفية الخبيثة و التدويد لجروح الأذن الخارجية و كذلك حدوث الجروح القطعية. و قد أستجابت جميع هذه الحالات للأستئصال الجراحى للأذن الخارجية دون حدوث أى مضاعفات.