Case Report

Histopathology of Tumor and Tumor- Like Lesions in Twelve Female Water Buffaloes

Walaa Awadin* and Esam Mosbah†

Summary
A histopathological analysis of twelve biopsy specimens of tumor and tumor- like lesions obtained from female buffaloes in the period 2008–2013 was performed at the department of Pathology, faculty of veterinary medicine, Mansoura University, Egypt. Among the total number of specimens, seven lesions were located in the skin including two ulcerating lesions, one ulcerating lesion with superficial spreading basal cell carcinoma (SSBCC), two parakeratotic hyperkeratotic lesions with spongiosis and intracellular edema, one dermoid cyst and one epidermoid cyst. In addition to an encapsulated tail base abscess, four tumorous masses were diagnosed as adenocarcinoma, buccal capillary hemangioma, buccal squamous cell carcinoma (BSCC), and rectal leiomyoma with parasitic infestation.

Keywords
Water buffalo; Unusual tumor and tumor like lesions; Histopathology

Introduction
Water buffalo is an important domestic animal for milk and meat production in Egypt, contributing significantly to its agricultural economy. Scant information is available on tumors in buffaloes. Skin papilloma [1], fibropapilloma [2] and melanocytoma [3] were previously recorded in buffaloes. Buffalo’s rectal leiomyoma, fibroma, fibrosarcoma, plexiform hemangioma and myxoma were also reported by Mosbah and El-Naggar [4]. A case of pineocytoma was reported in an 18-year-old female lowland anoa (Bubalus depressicornis) [5]. Congenital ocular dermoid cyst, located at the lower eyelid of a river female buffalo calf was presented by Sarrafzadeh-Rezaei [6]. The present work describes the pathology of tumor and tumor like lesions in twelve water buffaloes.

Materials and Methods
A total number of 411 water buffaloes of different ages and sexes belonged to either the buffalo farm, or the smallholders were examined during the period from 2008-2013. Case history, general health condition, age were recorded. Clinical examination including location, and size as well as description of all lesions was registered. Animals were operated under the effect of xylazine HCl 2% (XYLAJECT, ADWIA, A.R.E.) at a dose of 0.05 mg/kg B.W. Infiltration analgesia using lidocaine HCl 2% (Debocaine, El-nasr Pharma. chemicals Co. for Al-Debeiky Pharma-A.R.E.) was applied. Caudal epidural anesthesia was induced in two buffaloes with 0.03 mg/kg B.wt Xylazine hydrochloride diluted in 5 ml of 2% lidocaine HCl. The affected animals were approached either in standing position or in lateral recumbency. Total surgical excision of the masses was performed. Rectal leiomyoma was resected according to Mosbah and El-Naggar [4]. Histopathological findings, survival and recurrence after surgery were also reported. For histopathological examination, all biopsies were fixed in 10% neutral buffered formalin, and then embedded in paraffin wax. Serial sections were cut at 5 µm thickness and routinely processed for H&E staining [7]. The histopathological analysis was performed at the department of Pathology, faculty of veterinary medicine, Mansoura University, Egypt.

Results
Biopsy specimens were collected from twelve female buffaloes including 7 lesions in the skin, 4 tumors and one encapsulated abscess. Two ulcerating skin lesions were seen in the neck of two buffaloes (6 and 7 years old). Grossly they were 2 cm×1.5 cm dry, rough, dark and circumscribed areas. Microscopically, they showed ulcerating skin with microabscesses and sparse mononuclear cell infiltrates in the dermis. Additionally, a third ulcerating lesion (2.5 cm×2 cm) was observed in the trunk of a buffalo (8.5 years old). Superficial spreading basal cell carcinoma (SSBCC) was evident in the microscopic examination. Multiple atypical mitotic Figures were evident in basal cells in epidermal area adjacent to the skin ulcer associated with dermal telangiectasia. No metastasis or infiltration was seen (Figure 1A and 1B).

Parakeratotic hyperkeratosis (2 cm×2 cm) was detected in 2 buffalo cows (7 and 9 years old). Macroscopically, severe hyperkeratotic skin lesions were located in the skin covering the dorsal aspect of calcaneal tuberosity of fibular-tarsal bone (point of the hock joint) in the left hind limb in a buffalo and in both hind limbs of another buffalo. The microscopic picture revealed parakeratotic hyperkeratosis, hyperplasia of the lower epidermis, intracellular and intercellular edema and vacuolation of the upper part of the epidermis. Keratin occasionally admixed with degenerated neutrophils, necrotic debris, serum, and bacilliform bacterial colonies. Hypergranulosis and inflammatory cell infiltration in dermis were observed. Neutrophils occasionally extend into hair follicles (Figure 2A and 2B). Multiple hair follicles were mildly ectatic and filled with keratinous debris.

Multilocular dermoid cyst (19 cm×11 cm×8 cm) was seen in skin

Figure 1: A) Gross picture of ulcerating lesion at lower 2/3 of trunk (arrow). B) Histopathology showing atypical mitotic figures in basal cells adjacent to ulcerating surface (arrowheads). HE 200x.
of intermandibular space of a buffalo female calf (8 months age). It appeared as a lobulated firm cyst with a keratinized surface covered with little. Microscopically, it was lined with keratinized stratified squamous epithelium adjoining sebaceous and sweet glands (Figure 3A and 3B).

Epidermoid cyst (4 cm x 1 cm x 1 cm) was noticed just above the muzzle in one buffalo cow (5 years old). Grossly, it looked as a rough small oval shallow elevation that lacked hair. It was firm to hard in consistency and it was not easy to be cut. Histopathology showed a non-keratinized stratified squamous epithelial lining the epidermoid cyst without skin appendages (Figure 4A and 4B).

A semispherical abscess of small orange size (4 cm x 3 cm x 3 cm) was detected subcutaneously at the tail base of one buffalo cow (4.5 years old). It was encapsulated, and filled with material resembling a mixture of cottage cheese and buttermilk. It was surgically resected as a mass and the wound was healed within 15 days. Microscopically, the abscess consisted of aggregation of living and degenerated neutrophils suspended in a loose connective tissue surrounded by a capsule consisted of a thick fibrovascular connective tissue (Figure 5A and 5B).

A large solid, firm mass (26 cm x 15 cm x 9 cm) was seen in one buffalo cow (11 years old) just in front of the shoulder point. Cut section shows white uneven surface. Wound dehiscence with recurrence of the mass was occurred two months following surgery. Histopathologically, the mass showed glandular structures with a prevalent tubular arrangement. Multilayered neoplastic epithelial cells were cuboidal to columnar and lined the glandular acini with secretion (Figure 6A and 6B). The tumor cells had ill-defined borders.

Nuclei were round to plump oval, with margination of chromatin and often numerous distinct nucleoli. Mitotic activity was low.

Two buccal tumors were reported in this presentation and both were located at the right cheek of 2 buffalo cows. The first one was diagnosed as capillary hemangioma and it appeared as a small red area (3 cm x 4 cm) which bled especially during feeding and rumination (5.5 years old buffalo cow). Histopathological findings revealed numerous proliferating capillaries lined by endothelial cells. Hemorrhage was also observed (Figure 7A and 7B).
The second tumor appeared as a large (12 cm×7 cm) rectangular mass protruding from the mouth of a 9 years old buffalo cow and hindering feeding of the animal. It was diagnosed as buccal squamous cell carcinoma (BSCC). The surface of the latter was ulcerated. The neoplasm consisting of moderately differentiated cell nests embedded in a connective tissue stroma. HE 100x.

One rectal tumor was demonstrated (20 cm×16 cm×9 cm) in this presentation affecting a buffalo cow (6.5 years old). It appeared as a dark red fleshy mass protruding from the rectum. It was diagnosed microscopically as leiomyoma arising from the muscularis propria of the rectal wall. At the periphery of the neoplasm, unidentified parasites were noticed surrounded by macrophages, lymphocytes and multinucleated giant cells (Figure 8A and 8B).

Surgical excision was curative in all cases except in the buffalo suffered from adenocarcinoma.

Discussion

This study described the histopathology of different tumor and tumor like lesions in twelve female water buffaloes in Egypt. Seven of which were originated in the skin including two ulcerating lesions, one ulcerating lesion with SSBCC, two parakeratotic hyperkeratosis with spongiosis and intracellular edema, one dermoid cyst and one epidermoid cyst. Besides, one large tail base abscess, four tumorous masses were diagnosed including adenocarcinoma, buccal capillary hemangioma, buccal squamous cell carcinoma and rectal leiomyoma. Scant information is available on the description of majority of these lesions in cattle and buffaloes. All the affected animals were females and almost all of them were adult cows (more than 4 years old), which may be explained partially by the fact that males had been sent to be slaughtered before the age of peak incidence. One exception is the dermoid cyst which is a congenital developmental failure of the epidermal closure, was seen in 8 months calf. Dermoid cysts characterized by the presence of mono-or multilocular swellings lined by stratified squamous epithelium. Adnexal structures (pilosebaceous units) connect with the cyst. They contained a jumbled mass consisting of fluid, muddy material and separate tufts of hair [8]. They were recorded in goat [9], in Merino sheep [8], in cattle [10] in donkeys [11,12], in buffaloes [13] and in camel [14,15]. Surgical excision was curative which was endorsed Angarano and Swaim [16]. Meanwhile, the epidermoid cyst is a benign cyst usually found on the skin. The cyst develops out of ectodermal tissue. Histologically, it is made of a thin layer of squamous epithelium.

Among the other disease problems recorded in buffaloes, wounds, 50% of which were maggot wounds; and dermatitis, 33% of which were due to external parasite, each contributed about 9.2% of the total disease conditions [17]. In addition, forty percent of the wounds in smallholder buffaloes were slash wounds that are probably due to the reaction of angry neighbors on the animals grazing on their property. In most instances, slash wounds were located at the base of the tail [17]. These slash wounds may be the route of entry for the pathogen causing the large tail base abscess recorded in our study. Ulcerating skin lesions may also result from unhealed wounds. SSBCC was detected in epithelium adjacent to one of these ulcerating lesions. SSBCC is the second common subtype after nodular subtype of basal cell carcinoma and seen mostly on the trunk and extremities. In human, it has one of the highest recurrence rates of any basal cell carcinoma. Therefore, appropriate diagnosis and therapy are essential. Clinically, SSBCC in human may present as a solitary patch or multiple patches. It may appear with the characteristic pearly, rolled border with a slightly depressed center. It can resemble a patch of dermatitis and can be confused with eczema, psoriasis, lichen planus, or Bowen’s disease [18,19]. Thus, the clinical features alone may not reveal the appropriate diagnosis. Dermoscopy may assist in this endeavor [19]. Shiny white to red areas; short, fine telangiectasias; and erosions are the hallmark dermoscopic features of SSBCC [19]. SSBCC usually grows laterally, and can reach substantial sizes. Horizontal growth allows this tumor to extend significantly beyond the clinical borders. However, because of the nature of SSBCC, the tumors may be inadequately excised despite clear margins. Deep tissue excision may also be unnecessary, as the tumor cells are usually very superficial. In human, topical imiquimod or 5-fluorouracil may be alternative or adjunct therapies for SSBCC [20-22].

The parakeratotic hyperkeratosis detected in the hock region mimic superficial necrolytic dermatitis (hepatocutaneous syndrome) which diagnosed in older dogs and rarely in cats [23]. Clinically, it was characterized by both severe alterations of the liver (neoplasia, cirrhosis etc.) and by severe crusty skin lesions especially of the footpads and the mucocutaneous junctions in dogs. Histologically, the epidermal lesions included parakeratosis and laminar intracellular edema [24]. These clinical and morphologic findings were strikingly similar to those of necrolytic migratory erythema in human beings, the most common cause of which is hyperglucagonemia due to islet cell tumor of the pancreas [25]. Unfortunately, clinical testing of liver function was not expectedly done in our case. However, this report considered the first to describe this lesion in buffalo.

Moreover, tubular adenocarcinoma was diagnosed in one case which may originate from sweat glands. A very similar tubulopapillary...
adenocarcinoma, arising from apocrine sweat glands of the skin was diagnosed in a live-born mouflon (Ovis musimon) on the left shoulder [26]. However it was multifocal. Tumors of the sweat glands are rarely reported in animals. In dogs [27,28] and cats [29], only 2.2% of skin neoplasms are of apocrine gland origin. Reports in other animal species consist of 3 mixed tumors in cattle on the ventral surface of the tail [30-32]. Three cases each of adenaoma and carcinoma in aged ponies [33,34], one case of carcinoma in a golden hamster [35] and one case of apocrine adenoma of the skin in a hare [36] were previously reported. To our knowledge, adenocarcinoma, buccal capillary hemangiomata and BSCC were not previously described in water buffaloes. In human, buccal carcinoma commonly presents as a slow-growing mass on the buccal mucosa. Squamous cell carcinoma in the head and neck region occurs primarily in the oral cavity and oropharynx and is generally regarded as a disease of the elderly [37]. Pain commonly occurs as the lesion enlarges and ulceration develops. Oral intake may worsen the pain and lead to malnutrition and dehydration. Associated symptoms include bleeding, poor denture fit, facial weakness or sensory changes, dysphagia, odynophagia, dehydration. Associated symptoms include bleeding, poor denture fit, facial weakness or sensory changes, dysphagia, odynophagia, and trismus [38]. The occurrence of leiomyomas in the rectum of buffaloes has been previously reported in three independent studies [4,39,40]. Rectal leiomyoma in our presentation was accompanied by unidentified parasitic infestation.

References

Author Affiliations
1 Department of Pathology, Faculty of Veterinary Medicine, Mansoura University, Mansoura, Egypt
2 Department of Surgery, Anaesthesiology and Radiology, Mansoura University, Mansoura, Egypt


doi:http://dx.doi.org/10.4172/2325-9590.1000113