Scientific Report

Coincidence of congenital infiltrative facial lipoma and lingual myxoma in a newborn Holstein calf

Hobbenaghi, R.[1]**; Dalir-Naghadeh, B.**[2] **and Nazarizadeh, A.**[1*]

[1]Department of Pathobiology, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran; [2]Department of Clinical Sciences, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran

[*]***Correspondence:*** *A. Nazarizadeh, Department of Pathobiology, Faculty of Veterinary Medicine, Urmia University, Urmia, Iran. E-mail: dr_alinazarizadeh@yahoo.com*

(Received 4 Dec 2014; revised version 10 Mar 2015; accepted 20 Apr 2015)

Summary

A one-day-old male Holstein calf was presented with a palpable subcutaneous mass, extending from the parotid to the orbital region, involving the entire right side of the face and a large flabby mass without any evidence of inflammation or edema on the tongue. Macroscopically, the cut surface of the lingual mass appeared slightly lobulated, pink, with a mucoid appearance and gelatinous consistency. Histopathological examination confirmed the infiltrative subcutaneous lipoma and lingual myxoma evidenced by low cellularity and abundant basophilic, mucinous stroma. In this report, clinical and detailed histhopathological findings of congenital infiltrative myxoma and its coincidence with infiltrative facial lipoma is reported in a newborn calf.

Key words: Calf, Histopathology, Infiltrative lipoma, Infiltrative myxoma

Introduction

Tumors in calves, like those in children, are relatively uncommon. These tumors are interesting because of their occurrence early in life, indicating a probable congenital nature (Misdorp, 2002). Myxoma is a benign neoplastic process (Okamoto *et al*., 2002) of fibroblast or multi-potential mesenchymal cells origin, distinguished by its abundant myxoid matrix rich in mucopolysaccharides (Meuten, 2002; Maxie and Jubb, 2007). Myxoma is extremely rare in cattle and usually occurs in adult or aged animals as solitary or infiltrative soft masses (Misra *et al*., 1981; Maxie and Jubb, 2007). In a retrospective study of 6,706 cattle during the period of January 1964 to December 2008, only a single case of myxoma was detected among the 586 tumors in Brazil (Lucena *et al*., 2011). The etiology of this tumor is unknown (Allen, 2000). Genetics, environmental factors, carcinogenic drugs or miscellaneous toxic substances are among the probable causes of this neoplasm (Yeruham *et al*., 1999). Tumors arising from subcutaneous lipocytes occur in all species but mostly in dogs and may be multiple. In all species, lipomas are usually found in adult and aged animals, predominantly located on the trunk and proximal limbs (Maxie and Jubb, 2007). Neoplasms of adipose tissue rarely appear in adult cattle, usually single and localized in abdominal cavity (Ozmen, 2005). Infiltrative lipoma is an extremely rare variant of lipoma, as only two cases of infiltrative lipoma have been reported in calves (Di *et al*., 2002; Sickinger *et al*., 2009). The objective of this report was to describe the clinical and histhopathological characteristics of a unique case of congenital infiltrative subcutaneous lipoma and lingual myxoma in a Holstein calf.

Case description

A one-day-old male Holstein calf was presented to the Clinic of Veterinary Faculty of Urmia University with a palpable subcutaneous mass, extending from the parotid to the orbital region, involving the entire right side of the face. Based on the owner's statement, the calf was the first parturition of heifer and was delivered with dystocia. The mass was firm, immobile, and painless without any evidence of inflammation or edema over the area. This periorbital mass was elongating into the orbital cavity which had caused extreme exophthalmia and lacrimation. The overlying skin was intact and mobile. The tongue was larger and softer than normal with a bulky flabby mass, protruded from the dorsum of the lingual body, making it impossible for the calf to close its mouth (Fig. 1). Manipulation of the tongue did not cause pain or resentment. The saliva was drooling and the calf was unable to either suckle its dam or suck colostrum and milk from a nipple bottle or bucket.

Physical examination revealed no abnormalities in other organs; however, the body temperature was lower (37.9-Celsius degrees) than the normal limit. Blood analysis showed normal hematological and biochemical profiles.

Due to poor prognosis, the calf was humanely euthanized and detailed necropsy was performed. No lesion was found in the carcass except the afore-mentioned masses.

Grossly, the lingual mass was measured as 8 × 6 × 2.5 cm in diameter. On cut surface, the lesion appeared slightly lobulated, pink, with a mucoid appearance and gelatinous consistency (Fig. 2).

A well-circumscribed, uncapsulated, firm, homogeneous whitish mass, indistinguishable from normal fat, measuring 22 × 12 × 8 cm, with a tendency to infiltrate the surrounding structures was present in the sub-cutis of right side of the face. The mass was separated by septae of connective tissue (Fig. 3).

The tissue specimens were fixed and sectioned as thin 5 µm and stained by H & E method as well as Masson's trichrome and PAS techniques for detection of collagen and glycosaminoglycan.

Microscopically, the lingual mass was composed of stellate, spindle and occasionally elliptical cells, randomly scattered within an abundant basophilic, mucinous stroma containing few tiny blood vessels, without exquisite borders. Cellularity was typically low and the cells had small hyperchromatic nuclei. No pleomorphism and mitotic figures were evident.

The mucoid materials stained positively with PAS, indicating the presence of glycosaminoglycan in the myxoid background (Fig. 4). Moreover, Masson's trichrome staining highlighted the presence of very sparse delicate collagen fibrils in the matrix (Fig. 5). Microscopic observations also revealed that the tumor mass invaded its adjacent tissues. Muscle fascicles and skeletal muscle fibres were infiltrated and replaced by the myxoid matrix with scattered tumour cells. Furthermore, the neoplastic cells penetrated the epithelium of the tongue. The definitive histologic diagnosis was the infiltrative intramuscular myxoma.

Subcutaneous mass was diagnosed as lipoma. Light microscopic examination confirmed the infiltrative nature of the mass. The tumor consisted of well-differentiated adipocytes that were arranged in small lobules with no pleomorphism, anaplasia and mitotic figures. The cells had crescent-shape nuclei and single big fat vacuoles in the cytoplasm (Fig. 6).

Discussion

Congenital myxoma has been reported previously in the muzzle of a female Holstein calf without any picture (Yeruham *et al*., 1999). To the author's knowledge, this is the first report that illustrates the detailed

Fig. 1: A large, firm, smooth, mass appears to deform the entire right side of the face and mandible. Notice extreme exophthalmia, lacrimation and bulky protruded tongue

Fig. 2: The cut surface of the lingual mass with slight lobulation and a mucoid appearance

Fig. 3: The excised facial mass. Notice the severe and deep invasion of the mass to the surrounding tissues

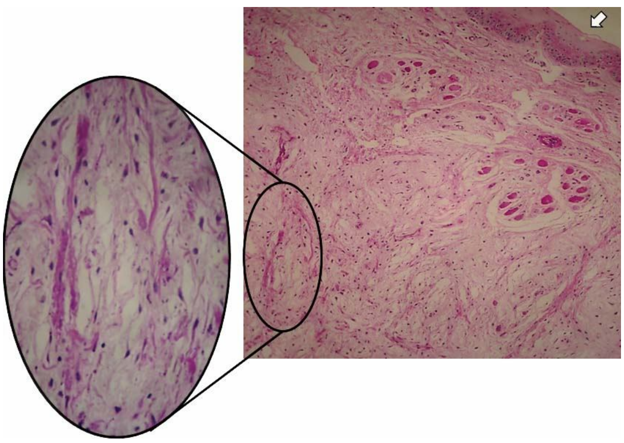

Fig. 4: Photomicrograph of the lingual neoplasm, which welded from the epithelium of tongue (arrow), infiltrated into the deep layers of muscles. Scant tumor cells distributed within abundant myxoid matrix stained in pale pink color. High-power view shows the presence of uniform stellate to spindle-shaped cells with hyperchromatic nuclei, (PAS ×100 to ×400)

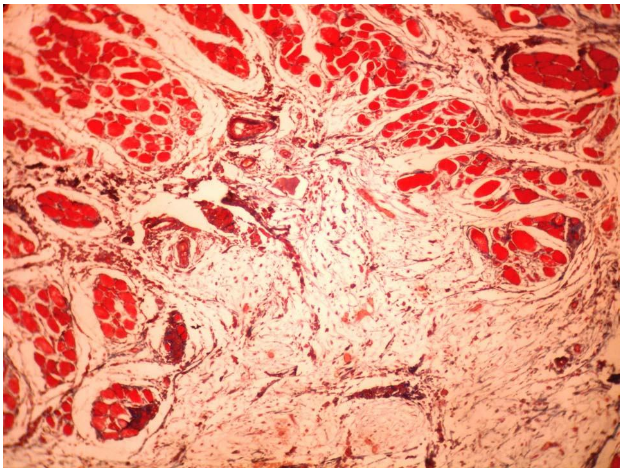

Fig. 5: The lingual tumor mass, severely invaded adjacent tissue. Notice, a few residual, shrunken, degenerating, splitting-up skeletal muscle fibers (Masson's trichrome ×100)

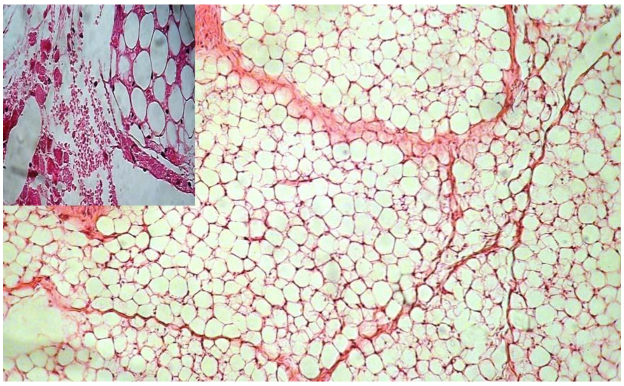

Fig. 6: Photomicrograph of the subcutaneous mass: low magnification (×100) shows a lipoma mass, containing well-differentiated adipocytes, which are lobulated by fine rims of connective tissue. It can bee seen from the high magnification (×400) that the tumor infiltrated into the surrounding tissues and caused hemorrhage, (H&E staining)

histopathological findings of congenital myxoma in a newborn Holstein calf. The tumor was locally invasive and associated with infiltration and destruction of adjacent tissues; however, in the previous report, the mass was solitary and smaller than the present one.

Macroscopically, myxomas are soft masses which exude a stringy clear mucoid fluid (Allen, 2000; Meuten, 2002). The mass reported here had gelatinous consistency with no aspirable fluid on the puncture. With this aspect, it is inconsistent with previous reports. However, microscopic features of the tumor are highly similar to the observations in other animal species (Yaman *et al*., 2004; Ilhan and Yener, 2009; Olgun Erdikmen *et al*., 2009; Lohr *et al*., 2012).

Intramuscular myxoma must be differentiated from the juxta-articular myxoma, myxoid malignant fibrous histiocytoma (myxofibrosarcoma), low-grade fibro-myxoid sarcoma, and myxoid liposarcoma (Allen, 2000). Based on the histological sections, it is too difficult to differentiate juxta-articular myxomas from an intra-muscular myxoma, particularly if the juxta-articular myxoma invades the muscle. However, the anatomic location can be very helpful. Histologically, juxta-articular myxomas tend to be less homogeneous and more fibroblastic and cystic than intramuscular myxomas, and mitotically active atypical reactive cells may be apparent. Myxoid malignant fibrous histiocytoma (myxofibrosarcoma) contains foci of obvious cytologic malignancy, including poorly differentiated or de-differentiated areas (Allen, 2000).

Alternating fibrous and myxoid patterns as well as swirling, whorled patterns exist in low-grade fibromyxoid sarcoma. There are grade Crow's feet vasculature, lipoblasts (usually signet ring type) and variable cellularity in myxoid liposarcoma versus myxoma (Graadt van Roggen *et al*., 1999).

Other less confusing conditions include benign and malignant neural lesions (neurofibroma, neuro-fibrosarcoma and nerve sheath myxoma); rhabdomyo-sarcoma, chondrosarcoma, and oral focal mucinosis. Each of these lesions has specific diagnostic criteria; for instance, although myxoid changes can be seen within a rhabdomyosarcoma, the cells are relatively un-differentiated, with different subtypes of rhabdomyo-sarcoma exhibiting different cellular characteristics ranging from primitive round cells to cells exhibiting muscle differentiation (Robin *et al*., 2004). No hypercellular or pleomorphic areas, mitoses, swirling or vascular pattern and lipoblasts were evident in the present case. Considering all these findings, the mass is thought to be a myxoma.

Macroscopically, lipomas are freely moveable over the underlying deeper tissues and have a distinctive greasy feel. However, the mass reported in this case was immobile and had a firm consistency. Macroscopic and microscopic features were considerably similar to the previous report (Di *et al*., 2002).

In human neoplasms of adipocyte origin and cardiac myxoma, various chromosomal alterations have been described and some of these changes are used as a diagnostic key (Amano *et al*., 2003; Bartuma *et al*., 2008). In veterinary medicine, such determinations are poorly performed and are not fully established (Sickinger *et al*., 2009); however, since the fetal period is much shorter than the life span of an individual, it can therefore be expected that genetic factors rather than environmental factors play a role in the development of such tumors (Misdorp, 2002).

In this paper, we reported a novel coincidence case of congenital tumors in a calf. Both lipoma and myxoma are mesenchymal tumors. Due to the interdependent derivation of these tumors, it is not uncommon for more than one neoplasm to appear in an animal. Further research on this category should enhance our understanding of oncogenic mechanisms.

Acknowledgement

We would like to thank Dr. M. Mirzaie for her assistance in the preparation of the figures.

References

Allen, PW (2000). Myxoma is not a single entity: a review of the concept of myxoma. Ann. Diagn. Pathol., 4: 99-123.

Amano, J; Kono, T; Wada, Y; Zhang, T; Koide, N; Fujimori, M and Ito, K (2003). Cardiac myxoma: its origin and tumor characteristics. Ann. Thorac. Cardiovasc. Surg., 9: 215-221.

Bartuma, H; Domanski, HA; Von Steyern, FV; Kullendorff, CM; Mandahl, N and Mertens, F (2008). Cytogenetic and molecular cytogenetic findings in lipoblastoma. Cancer Genet. Cytogen., 183: 60-63.

Graadt van Roggen, JF; Hogendoorn, PC and Fletcher, CD (1999). Myxoid tumours of soft tissue. Histopathology. 35: 291-312.

Ilhan, F and Yener, Z (2009). Pulmonary myxoma in a sheep. Vet. Pathol., 46: 457-459.

Löhr, CV; Hedge, ZN and Pool, RR (2012). Infiltrative myxoma of the stifle joint and thigh in a domestic rabbit (*Oryctolagus cuniculus*). J. Comp. Path., 147: 218-222.

Lucena, RB; Rissi, DR; Kommers, GD; Pierezan, F; Oliveira-Filho, JC; Macêdo, JT; Flores, MM and Barros, CS (2011). A retrospective study of 586 tumours in Brazilian cattle. J. Comp. Path., 145: 20-24.

Maxie, G and Jubb, KVF (2007). Skin and appendages. In: Maxie, MG (Ed.), *Jubb, Kennedy, and Palmer's pathology of domestic animals*. (5th Edn.), USA, Elsevier, Saunders. PP: 762-766.

Meuten, DJ (2002). Tumors of the skin and soft tissues. In: Goldschmidt, MH and Hendrick, MJ (Eds.), *Tumors in domestic animals*. (4th Edn.), Iowa State, Blackwell Publishing Co., PP: 91, 97.

Misdorp, W (2002). Tumours in calves: comparative aspects. J. Comp. Path, 127: 96-105.

Misra, SS; Angelo, S and Azad, CS (1981). Interdigital myxoma in a Hariana cow. Vet. Med. Small Anim. Clin., 76: 381.

Okamoto, S; Hisaoka, M; Meis-Kindblom, JM; Kindblom, LG and Hashimoto, H (2002). Juxta-articular myxoma and intramuscular myxoma are two distinct entities. Virchows. Arch., 440: 12-15.

Olgun Erdikmen, D; Haşimbegoviç, H; Şennazli, G and Sonmez, K (2009). A cutaneous myxoma case in A 12-year-old Boxer. Kafkas Univ. Vet. Fak. Derg., 15: 301-304.

Ozmen, O (2005). Clinical case: congenital lipomatosis in a Brown Swiss calf. Revue. Méd. Vét., 156: 191-193.

Robin, C; Bastidas, J and Boguslaw, B (2004). Case report: myxoma of the temporalis muscle. Oral. Surg. Oral. Med. Oral. Pathol. Oral. Radiol. Endod., 97: 620-624.

Sickinger, M; Erichsen, J; Doll, K and Reinacher, M (2009). Congenital infiltrative lipomas in a calf. J. Vet. Diagn. Invest., 21: 719-721.

Yaman, I; Durgun, T and Karabulut, E (2004). Case report of a myxoma in a gamecock. Vet. Med. Czech. 49: 268-270.

Yeruham, I; Perl, S and Orgad, U (1999). Congenital skin neoplasia in cattle. Vet. Dermatol., 10: 149-156.