

INFILTRATIVE LIPOMA IN THE FORELEG OF A HORSE

*Infiltratief lipoma in het voorbeen van een paard*E. Ollé¹, J.H. Saunders², D. Desmecht³¹ Large Animal Teaching Hospital, Faculty of Veterinary Medicine, University of Liège, Sart-Tilman-B42, 4000 Liège, Belgium² Department of Medical Imaging, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133, B-9820 Merelbeke, Belgium³ Department of Pathology, Faculty of Veterinary Medicine, University of Liège, Sart-Tilman-B43, 4000 Liège, Belgium

ABSTRACT

This case report describes an infiltrative lipoma in a horse. A slow-growing mass, detected early after birth, was present at the caudal aspect of the foreleg (antebrachium) of a 2-year-old gelding. Cytological features were that of a benign lipoma. Surgical resection was attempted but failed due to the infiltrative nature of the mass. Consequently, the horse was euthanized. Histopathology revealed an infiltrative lipoma. This tumor is histologically benign but surgical resection is usually impossible due to its infiltrative nature.

SAMENVATTING

Dit artikel beschrijft een infiltratief lipoma bij een paard. Een traag groeiende massa was zichtbaar aan de caudale zijde van het rechter antebrachium (onderarm) sinds de geboorte. Cytologisch werd een lipoma gediagnosticeerd. Chirurgische resectie was niet mogelijk door de infiltratieve natuur van de tumor. Uiteindelijk werd voor euthanasie gekozen. Histopathologisch onderzoek toonde een infiltratief lipoma aan. Deze histologisch goedaardige tumor is evenwel chirurgisch meestal moeilijk te reseceren vanwege zijn infiltratief karakter.

INTRODUCTION

Infiltrative lipoma is a rare soft-tissue tumor that has been described in dogs (Gleiser *et al.*, 1979; McChesney *et al.*, 1980; Kramek *et al.*, 1985; Frazier *et al.*, 1993; Bergman *et al.*, 1994; McEntee and Thrall, 2001), horses (Blackwell, 1972; Baker and Dreger, 1987; Lepage, 1993), human beings (Dionne and See-mayer, 1974; Fletcher and Martin-Bates, 1988; Bjerregaard *et al.*, 1989) and in a cat (Esplin, 1984). In the dog, a breed predilection has also been suspected in Labrador retrievers but not confirmed due to the absence of a reference population (Bergman, 1994; McEntee *et al.*, 2000).

This type of lipoma should not be confused with benign lipoma and liposarcoma (Thomas and Fox, 1998). In contrast to benign lipoma, infiltrative lipoma is poorly circumscribed and may infiltrate tendons, nerves, blood vessels and lymph nodes (Thomas and Fox, 1998). It may be differentiated from

liposarcoma by the presence of well-differentiated fat cells that do not metastasize (Thomas and Fox, 1998). Nevertheless, Saik (1987) suggested that infiltrative lipoma, on the basis of its biological behavior, can be classified as a well-differentiated liposarcoma.

Reported cases in horses were located in the neck (Blackwell, 1972), the heart (Baker and Dreger, 1987) and the flank (Lepage *et al.*, 1993). In the horse with an infiltrative lipoma located in the neck, the tumor was first noticed on the first day of life. Diagnosis was made at the age of two months in the horse with an infiltrative lipoma located on the flank. The infiltrative lipoma located in the heart was found incidentally at necropsy in an asymptomatic 3-year-old horse. A congenital origin of the disease has been suggested due to the young age of the affected animals (Bergman *et al.*, 1994).

In this paper, we describe a case in which the tumoral mass was also observed on the first day of life.

CASE HISTORY

A 2-year-old gelding, Selle Français, weighting 550 kg, was presented to the Large Animal Clinic of the Faculty of Veterinary Medicine, University of Liège, Belgium, with a history of a progressively growing mass located in the right foreleg. The mass was detected early after birth and became larger as the horse grew older. A fine-needle aspiration was performed one year before presentation by the referring veterinarian without any result.

The general condition was unremarkable. At inspection, a mass was visible, extending distally from the proximal third of the right radius to the distal metaphysis. At palpation, the mass was firm, not painful and showed no increased local temperature. Radiography revealed a circular opacity of 30 x 15 cm located at the caudal aspect of the right radius. Minimal periosteal reactions were visible at the caudodistal aspect of the radius. Ultrasonography showed a mixed echogenic mass containing multiple anechoic areas. A fine-needle aspiration was performed with a 20G spinal needle. Cytology revealed the presence of fibroblasts and lipocytes, suggesting a diagnosis of lipoma. The differential diagnosis included benign lipoma, infiltrative lipoma, other mesenchymal neoplasia (rhabdomyoma, rhabdomyosarcoma, fibroma, fibrosarcoma) or hamartoma. Complete blood count and biochemical tests were within normal limits.

Surgery was attempted. The horse was premedicated with penicillin procaine (12,000 I.U./Kg IM), Vit. E (200 mg, IM) and Selenium (12 mg, IM). Sedation was performed with acepromazine maleate (0.1 mg/kg, IM) and xylazine (0.6 mg/kg, IV). Induction was done with Ether Glyceril Guayaquil 10% and thio-barbital sodic (2 g) at dose response. Maintenance was assumed with isoflurane and oxygen. The horse was placed in dorsal recumbency, and two transversal and one longitudinal incisions were made at the caudal aspect of the forearm. The mass was located just under the skin and blunt dissection was attempted. Complete surgical resection was prevented by the invasive nature of the mass. An attempt was made to divide it but this failed due to attachment to the surrounding muscles, vessels, nerves, and also to the caudal aspect of the radius. Consequently, the horse was euthanized.

Necropsy revealed an 8 kg fatty-like mass (white-yellow color and soft "jelly-like" appearance, suggesting a lipoma) located caudal to the right radius. All internal organs were within normal limits. Except

for the right radius, the skeletal system appeared to be normal. Histopathology showed well-differentiated lipocytes, scanty fibrous connective tissue dividing the mass into lobules, and neoplastic infiltration of the adjacent muscle bundles and fibers by fat cells (Fig. 1). A diagnosis of an infiltrative lipoma was made.

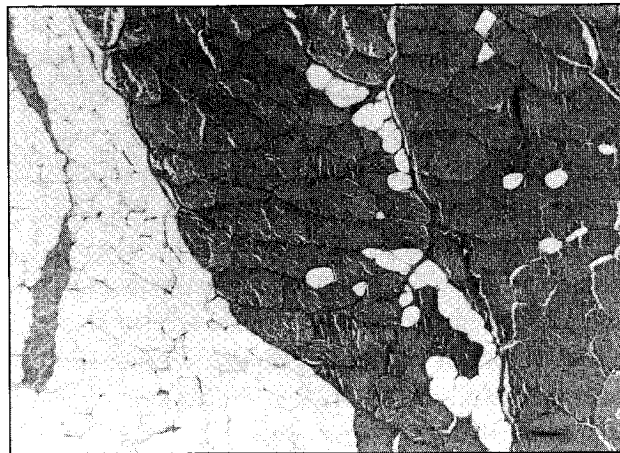


Fig. 1. Photomicrograph of the infiltrative lipoma showing well-differentiated lipocytes infiltrating the adjacent muscle bundles and fibers.

DISCUSSION

The slow growth rate of the infiltrative lipoma, as was observed in the present horse, may be responsible for the delay between first observation by the owners and age at presentation. Consequently, at presentation the mass is generally large (Blackwell, 1972 ; Baker and Dreger, 1987 ; Lepage *et al.*, 1993). Clinical signs vary with the anatomic location and size of the mass. Laboratory findings are not helpful in the diagnosis of infiltrative lipoma. Radiography as well as ultrasonography may show the fatty nature of the tissue but these techniques are unable to indicate the infiltrative nature of the tumor (Gritzmann *et al.*, 1988). The computed tomographic (CT) appearance of the infiltrative lipoma has been described in two dogs but the images were not considered useful due to the inability to distinguish various tissue densities in some areas (Bergman *et al.*, 1994). In a more recent study, CT imaging was considered beneficial in determining the local extension of the disease prior to surgery and/or radiation therapy, with a well- or moderately defined mass in 13 out of 22 dogs (McEntee and Thrall, 2001). In the remaining dogs, delineation was problematic in some areas where the infiltrative lipoma interdigitated with normal body fat (McEntee and Thrall, 2001). On magnetic resonance imaging, infiltrative lipomas show a high signal intensity on T1-

and to a lesser extent on T2-weighted images, comparable with that observed in subcutaneous fat (Ha *et al.*, 1994).

Aggressive surgical resection of the tumor is the treatment of choice but its success depends on the location and size of the tumor and the ability for the surgeon to correctly define its margin (Bergman *et al.*, 1994). In dogs and human beings, the recurrence rate is 36% (Bergman *et al.*, 1994) and 62% (Fletcher and Martin-Bates, 1988 ; Bjerregaard *et al.*, 1989), respectively. In a recent study on 13 dogs, radiotherapy used alone or in combination with surgery resulted in a mean survival duration of 46.4 months (McEntee *et al.*, 2000). In the same study, it was suggested that radiotherapy alone can result in long-term disease control in dogs with microscopic disease and in a stable or partial response in dogs with a moderate disease (McEntee *et al.*, 2000). In dogs with a gross disease, prior cytoreductive surgery can be beneficial (McEntee *et al.*, 2000). Of the two cases observed in living horses, one was euthanized (Blackwell, 1972) and the other one with neck location was submitted to surgical resection (Lepage *et al.*, 1993). Unfortunately, it was lost for follow-up after 44 days.

Post-operative histology is required for a definitive diagnosis, as cytology shows well differentiated fat cells that are indistinguishable from normal adipose tissue. The distinctive feature is the infiltration into and between the muscle fibers. Bone involvement is rarely encountered (Frazier *et al.*, 1993 ; Bergman *et al.*, 1994).

To conclude, infiltrative lipoma must be included in the differential diagnosis of soft-tissue masses with muscular or cutaneous location, especially in young horses. The tumor is histologically benign but surgical removal is usually prevented by the infiltrative nature of the tumor.

REFERENCES

- Baker D., Dreeger J. (1987) Infiltrative lipoma in the heart of a horse. *Cornell Veterinarian* 77, 258-262.
- Bergman P.J., Withrow S.J., Straw R.C., Powers B.E. (1994) Infiltrative lipoma in dogs: 16 cases. *Journal of the American Veterinary Medical Association* 205, 322-324.
- Bjerregaard P., Hagen K., Daugaard S., Kofoed H. (1989) Intramuscular lipoma of the lower limb. Long term follow-up after local resection. *Journal of Bone and Joint Surgery* 71, 812-815.
- Blackwell J.G. (1972) Unusual Adipose Tissue Growth in a Colt. *Journal of the American Veterinary Medical Association* 161, 1141-1142.
- Dionne G.P., Seemayer T.A. (1974) Infiltrating lipomas and angiolipomas revisited. *Cancer* 33, 733-738.
- Esplin D.G. (1984) Infiltrating lipoma in a cat. *Feline Practice* 14, 24-25.
- Fletcher C.D.M., Martin-Bates E. (1988) Intramuscular and intermuscular lipoma: neglected diagnoses. *Histopathology* 12, 275-287.
- Frazier K.S., Herron A.J., Dee J.F., Altman N.H. (1993) Infiltrative lipoma in a canine stifle joint. *Journal of the American Animal Hospital Association* 29, 81-83.
- Gleiser C.A., Jardie J.H., Raulston G.L. Gray K.N. (1979) Infiltrating lipomas in the dog. *Veterinary Pathology* 16, 623-624.
- Gritzmann N., Schratler M., Traxler M., Helmer M. (1988) Sonography and computed tomography in deep cervical lipomas and lipomatosis of the neck. *Journal of Ultrasound Medicine* 7, 451-456.
- Ha T.V., Kleinmann P.K., Fraire A. (1994) MR imaging of benign fatty tumors in children: report of four cases and review of the literature. *Skeletal Radiology* 23, 361-367.
- Kramek B.A., Spackman C.J.A., Hayden D.W. (1985) Infiltrative lipoma in three dogs. *Journal of the American Veterinary Medical Association* 186, 81-82.
- Lepage O.M., Lamerty S., Drolet R., Lavoire J.P. (1993) Infiltrative lipoma in a quarter horse. *Cornell Veterinarian* 83, 57-60.
- Mc Chesney A.E., Stephens L.C., Lebel J., Snyder S., Ferguson H.R. (1980) Infiltrative lipoma in dogs. *Veterinary Pathology* 17, 316-322.
- Mc Entee M.C., Page R.L., Mauldin G.N., Thrall D.E. (2000) Results of irradiation of infiltrative lipoma in 13 dogs. *Veterinary Radiology and Ultrasound* 41, 554-556.
- McEntee M.C., Thrall D.E. (2001) Computed tomographic imaging of infiltrative lipoma in 22 dogs. *Veterinary Radiology and Ultrasound* 42, 221-225.
- Saik J.E. (1987) Metastasis of a well-differentiated liposarcoma in a dog and a note on nomenclature of fatty tumours. *Journal of Comparative Pathology* 97, 370-373.
- Thomas R.C., Fox L.E. (1998) Tumors of the skin and subcutis. In: Morrison W.B. (eds). *Cancer in dogs and cats: medical and surgical management*. Williams & Wilkins, Philadelphia. 489-511.