SURGICAL CORRECTION AND HISTOLOGICAL ASSESSMENT OF LIPOMA IN DOG: A CASE REPORT

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Abstract

A two (02) years old male non-descriptive dog was presented with the history of progressively enlarging massive mass on the distal portion of the right hind limb. On physical examination the palpable mass was found semisolid type, but there was no pain at the affected site and no evidence of visible lameness. Lateral radiograph of right hind limb was advised and no attachment of the growth with the underlying bone was found on radiograph. Routine blood parameters were within the normal range and under general anaesthesia the mass was surgically removed. Excised mass was subjected to histopathological examination that revealed polyhedral closely packed neoplastic cells with vacuolated cytoplasm and flattened nuclei placed peripherally which confirmed the excised growth as lipoma. Present communication describes about the confirmatory diagnosis of lipoma and its uneventful surgical recovery in a dog.

Key words: Dog, Histopathology, Lipoma, Surgery

INTRODUCTION

Lipomas are benign fatty tumours of mesenchymal origin, comprised of mature fat cells (adipocytes), mostly seen in adult female or elderly obese dogs (Goldschmidt and Hendrick, 2002). Though exact etiology is unknown (Ludwig *et al.*, 2017), the proposed factors are hereditary, hormonal, congenital and trauma (Rapidis, 1982). These are the most common soft tissue tumours, usually surrounded by a thin capsule (Hoseini *et al.*, 2010) and may be localized in any region of the body, superficial or deep (Hakim *et al.*, 1994). The growth of lipoma is gradual and painless in nature (Malik *et al.*, 2020). Aiello (1998) reported that among domestic species,

these neoplasms are common in dogs but occasionally found in cats and horses and rare in sheep, goat and pig (Pulley and Stannard, 1990). Lipomas can be differentiated from liposarcomas and infiltrative lipomas by histopathology, advanced imaging and surgical findings. Lipomas are mostly confined to their primary location (Kumar *et al.*, 2017) and are less perilous compared to their malignant counterpart liposarcoma (Crowley *et al.*, 2020). Approximately 16% of dogs suffer from lipomas (Randall *et al.*, 1998). Šimkus *et al.* (2015) had reported high incidence of lipoma in female dogs (66.7%) than male dogs (33.3%) and incidence is higher in old aged

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females (Julie *et al.*, 2013), while O'Neill *et al.* (2018) also reported that the incidence of lipoma more in aged dogs. They may occur over the thorax, abdomen, thighs and proximal limbs and number of lipomas can be single or multiple (Cowell *et al.*, 2008). The lipomas located between skin and muscle layers are generally soft on palpation and freely movable while intermuscular lipomas are not mobile as such (Veena *et al.*, 2013). Most lipomas are small, well circumscribed, movable, but not painful. However, large lipoma mass may become a cause of worrying concern, as they can restrict feed intake and their presence in affected areas may cause pain to animal (Subapriya *et al.*, 2020). Thus, the sizable lipomas can interfere with movement and locomotion, resulting in harmful consequences for the patients and anxiety for the owners. It has been reported that intr-regional injections of 10% calcium chloride solution cause lipoma regression, but this treatment is not recommended because irritation and skin necrosis may occur (Albers and Theilen, 1985). So the surgical excision is the right choice of treatment (Veena *et al.*, 2013) lipomas usually do not recur following complete excision. Lipomas on microscopic examination may appear very similar to normal fat tissue, hence expertise and careful clinical examination of the mass is required to differentiate the benign lipomas from fatty change and normal fat tissue as well as the malignant fatty tumour *i.e.* liposarcoma (Subapriya *et al.*, 2020). The histopathology remains the gold standard in the diagnosis of lipoma (Metgud and Kale, 2004). The present article describes the confirmatory diagnosis of lipoma, its surgical excision and uneventful recovery.

A two (02) years old male non-descriptive dog, weighing 14 kg was presented to OPD of Veterinary Clinical Complex, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal and Fishery Sciences, Belgachia, Kolkata for assessment of large mass

situated over distal part of right hind limb (Fig. 1A). Clinical history revealed that initially the mass was of small size and there was gradual increase in size over a period of 3 months. During clinical examinations, the dog was bright, comfortable with no signs of visible lameness, on palpation the growth appeared soft in consistency, located subcutaneously and moving freely. Lateral radiography of distal part of the right hind limb revealed absence of any attachment to the underlying bony structures (Fig. 1B). Haemato-biochemical parameters, liver function test parameters and the clinical parameters like heart rate, respiration rate, and body temperature were within physiological limits. From physical, clinical examinations and radiography the growth was confirmed as soft tissue tumour and planned to perform surgical excision.

The dog was pre-anaesthetised with inj. atropine sulphate @ 0.04 mg/kg body weight subcutaneously and inj. xylazine HCl @ 1.2 mg/kg body weight intramuscularly (Inj. Xylaxin® Indian Immunologicals Ltd., India) along with inj. ketamine HCl @ 5 mg/kg body weight intravenously (Inj. Aneket®, Neon Laboratories Ltd., India) and inj. diazepam @ 0.5 mg/kg body weight as slow intravenous injection (Inj. Calmpose®, Sun Pharmaceutical Industries Ltd., India) to achieve surgical anaesthesia. The dog was restrained in lateral recumbency and hairs of operative site were clipped off for aseptic preparation of surgical site. An elliptical skin incision was given as proposed by Boyer (2015) and following blunt dissection, the growth was exteriorized carefully by separating the capsule completely from the underlying tissues (Fig. 1C) and kept for histopathological examination. The haemostasis was achieved by ligation and electrocautery. After lavage, subcutaneous tissue was apposed with subcuticular sutures to obliterate anatomical dead space by chromic catgut number 1-0 as suture material. Skin incision was closed by non-absorbable

Lipoma in dog

Fig. 1. Photograph showing soft mass at distal portion of hind limb. (A) the gross structure, (B) the radiograph showing no bony involvement and (C) the excised mass

Fig. 2. Photomicrograph of histological section of lipoma in a dog showing polyhedral neoplastic cells containing fat globules with vacuolated cytoplasm and peripherally placed nuclei [1. Nuclei of Adipocytes, 2. White Adipocytes] [H & E, 100X & 200X]

monofilament suture materials with simple interrupted suture pattern. As postoperative care, the animal was prescribed injection ceftriaxone sodium @ 25 mg/kg body weight intramuscularly (Inj. Monocef®, Aristo Pharmaceuticals Pvt. Ltd., India) twice daily for 5 days, 5% DNS (250 mL b.i.d) intravenously and inj. meloxicam @ 0.2mg/ kg body weight intramuscularly once daily (Inj. Melonex®, Intas Pharmaceuticals Ltd., India) for 3 days. Restricted movement and every alternate day dressing with antimicrobial ointment (Mupirocin) were advised for next 10 days. The skin sutures were removed on 10th day post operatively as the desired healing was achieved.

Cut section of the growth was evaluated for its external and internal appearance. The tumour sample was then sectioned and representative sample was fixed in 10% neutral buffered formalin for 48 hours, dehydrated in ascending grades of ethyl alcohol, cleared in xylene and then embedded in paraffin. Serial paraffin sections were cut at 5 µm thickness and stained by routine Haematoxylin and Eosin.

On gross examination the tumour appeared as round, pendulous and semisolid type. Cut section of the tumour was oily and pale whitish in colour. Rajni (2005) also reported that lipomas appeared as round and soft masses and on section, the masses are greasy in consistency, pale whitish and shiny. The tissue material collected for histopathological screening floated in the formalin, which was again very well suggestive of lipoma (Subapriya *et al.*, 2020). Histopathological examination of excised tumour growth revealed numerous polyhedral closely packed neoplastic cells containing white adipocytes with vacuolated cytoplasm. No mitotic figures were observed and the nuclei were found pushed to the periphery and appeared flattened against the cell membrane. Finally, lipoma was diagnosed (Fig. 2) based on the findings of Kosztyuova and Shim (2017).

Lipomas are called as universal tumours because of their distribution (Dehghani *et al.*, 2019) and they are benign neoplasms that consist of localized nodules of fat and originate from adipocytes of the subcutaneous tissue. Mostly lipomas are located in a well-defined manner, facilitate surgical excision, and have a good prognosis. As previously stated, the lesion can arise in any part of the body where there is abundant adipose tissue (Lanng *et al.*, 2004). Incidence of lipomas increases with the advancement of age and these lipomas are generally evident in overweight and old aged dogs (O'Neill *et al.*, 2018). The proximal extremity of limb and trunk are the most common site for lipomas (Goldschmidt and Hendrick, 2002), but they may also appear in perineal region (Besalti *et al.*, 2004), orbital region (Williams and Haggett, 2006) and inside body cavity (Mayhew and Brockman, 2002). Lipomas are more common than liposarcomas (malignant neoplasms of soft tissue) and histopathologically they are distinct (Baez *et al.*, 2004). Surgical excision has low rate of complications and a good prognosis (Weiss and Goldblum, 2001). No postoperative complications were noticed during the observation period of 8 months after surgery and there was no recurrence of growth. The reason for non-recurrence in present case might be due to its complete surgical excision and early diagnosis as opined by Rao *et al.* (2011) and Kramek *et al.* (1985).

Lipoma appears to be a common clinical case in primary-care practice. Lipoma may not cause acute problems but as they become large, can interfere with normal function of body and often cause severe anxiety to the owners. Careful clinical, imaging, and histological examination can reveal the typical characteristic of lipoma. However, there is very little and scant information available in the published articles about exact causes of lipoma, the possible predisposing factors discussed in the present study. If complete surgical excision is achieved, recurrence is extremely rare.

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