



Iranian Veterinary Surgery Association

Iranian Journal of Veterinary Surgery

Journal homepage: www.ivsajournals.com

Clinical Report

Intermuscular Lipoma in the Pelvic Limb of an Aged Shih Tzu-Terrier Dog

Davoud Kazemi*, Mehrdad Neshat-Gharamaleki

Department of Veterinary Clinical Sciences, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

ARTICLE INFO	ABSTRACT
<p><i>Article History:</i></p> <p>Received 26 November 2020</p> <p>Revised 9 January 2021</p> <p>Accepted 4 February 2021</p> <p>Online 4 February 2021</p>	<p>A ten and half-year-old spayed female Shih Tzu-terrier dog was presented with swollen mass in the right pelvic limb. The mass was first noticed by the owner three months prior to the presentation but it had enlarged significantly during the past seven days before presentation resulting in pain and lameness. Clinical examination revealed the presence of a large fluctuant mass with soft tissue consistency in the caudal region of the right stifle joint with pain elicited during joint flexion. A well circumscribed large fatty tumor situated between the semimembranosus and semitendinosus muscles was encountered during surgical exploration of the affected area under general anesthesia which was completely removed. Diagnosis of intermuscular lipoma was confirmed based on clinical findings, the gross appearance of the tumor, and the presence of mature adipocytes in histological sections. This report describes clinical signs, physical examination, and diagnostic imaging findings along with surgical treatment of canine intermuscular lipoma, a rare form of lipoma, and benign mesenchymal tumor of adipose tissue situated between muscle bellies which is not locally invasive and does not metastasize. To the best of our knowledge, this type of canine tumor has not been previously reported in Iran.</p>
<p><i>Keywords:</i></p> <p>Adipose tissue</p> <p>Mesenchymal tumor</p> <p>Stifle joint</p> <p>Canine</p>	

Introduction

Canine intermuscular lipomas are benign tumors of adipose tissue composed of mature adipocytes. They are a rare form of subcutaneous lipoma situated between muscle bellies in elderly dogs. The tumor has been reported from the caudal thigh region of the pelvic limb specifically between the semimembranosus and semitendinosus muscles and from the axillary region of the thoracic limb.¹⁻⁶ A single case of intermuscular lipoma situated between the external and internal abdominal oblique muscles has also been reported.⁷

Clinical signs associated with intermuscular lipoma include progressive enlargement, swelling, pain and lameness of the affected limb.^{1,2,5} In rare cases, sciatic neuropathy and Horner's syndrome may occur due to compression of specific nerves by the tumour.^{2,4} Intermuscular lipomas are treated by surgical excision and they have an excellent prognosis after surgery although steroid injection has also been recommended as a relatively safe and effective treatment method.³ This report describes a case of intermuscular lipoma of the hind limb in an aged female Shih Tzu-terrier dog. Reporting of this case is justified due to scarcity of

* Correspondence to: Davoud Kazemi, Department of Veterinary Clinical Sciences, Faculty of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran E-mail: dkazemi@iaut.ac.ir
www.ivsajournals.com © Iranian Journal of Veterinary Surgery, 2021
<https://doi.org/10.30500/IVSA.2021.259320.1233>



This work is licensed under the Creative Commons Attribution-NonCommercial 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc/4.0/>.

information about this tumor as a whole and particularly in our country.

Clinical Findings

A ten and half year old spayed female Shih Tzu-terrier dog was presented with swollen mass, pain and lameness in the right pelvic limb. The mass was first noticed by the owner 3 months prior to presentation. It had enlarged significantly a week before presentation resulting in pain and lameness for the past 3 days.

The animal was bright and alert during physical examination with normal temperature, pulse and respiratory rate. A large mass was observed in the caudal region of the right stifle joint extending from the femur to upper tibia (Figure 1A). On palpation, the mass was fluctuant with soft tissue consistency and pain was only noticed during flexion of the stifle joint. Radiographic examination revealed soft tissue swelling of the area (Figure 1B). On ultrasound examination, the mass was seen as a hypo-echoic area and thin hyper-echoic lines were evident within the mass. Aspiration was attempted under ultrasound guidance but no fluids were retrieved. The results of hematologic and serum biochemical evaluations were unremarkable. Thoracic radiography ruled out any evidence of metastasis. A tentative diagnosis of lipoma was made based on the above information and owner consent was obtained for surgical exploration and removal of the mass.

Treatment and Outcome

Surgery was performed under general anaesthesia with strict adherence to aseptic techniques. The skin of the caudomedial femoral region was incised and after careful blunt dissection of the subcutaneous tissues and separation of the semimembranosus and semitendinosus muscles, a large fatty tumor was encountered (Figure 2A). The tumor was not invasive and was completely removed without traumatizing the surrounding muscles. The incised tissues were routinely sutured and the animal recovered uneventfully. Mature adipocytes were observed on histopathological sections obtained from the tumor (Figure 2B). The diagnosis of intermuscular lipoma was confirmed based on tumor location and gross and histological characteristics.

Clinical Relevance

Lipomas are benign neoplasms of mesenchymal origin which are relatively common in dogs. It has been estimated that approximately 16% of dogs are affected

by lipomas. Elderly and obese dogs particularly females are prone to develop this type of tumor as they have a greater physiological tendency to accumulate body fat.⁵ Intermuscular lipoma, infiltrative lipoma and liposarcoma are three different forms of lipoma which could affect canine limbs.⁸ The first two types are benign non-metastasizing tumors although infiltrative lipomas are locally aggressive and invade the surrounding muscles. Liposarcomas on the other hand are malignant tumors which are locally aggressive with a potential for metastasis.^{8,9}



Figure 1. Macroscopic (A) and radiographic (B) appearance of intermuscular lipoma. A large mass is evident around the whole stifle joint extending from the femur to upper tibia which is seen radiographically as soft tissue swelling in the same anatomic area.

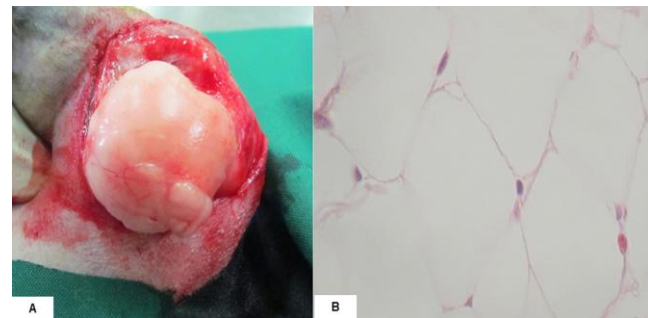


Figure 2. Intraoperative (A) and histopathologic (B) appearance of intermuscular lipoma. A well circumscribed yellow mass was encountered during surgical exploration which was easily resected. Microscopically, the mass contained mature adipocytes with peripherally located nucleus.

This report has described a case of intermuscular lipoma in the hind limb of a neutered female elderly dog. As previously stated, this type of tumor is rare in veterinary medicine and cases should be reported to help in diagnosis and treatment of further cases in the future. To the best of our knowledge, this type of canine tumor has not been previously reported in Iran. The

occurrence rate of intermuscular lipoma has not been determined in dogs but in humans they comprise 0.3% of all adipose tumours.¹⁰ The tumor was well circumscribed and easily removable. This is due to the fact that these tumors arise from the intermuscular septum and subsequently adipose tissue accumulates between adjacent muscle bundles confining the mass.⁵ In this case, the tumor was situated between the semimembranosus and semitendinosus muscles of the caudal femoral region. It appears that intermuscular lipoma has a predilection for this anatomic location and 71.4% of previously reported cases have also been observed at this particular location.¹⁻⁶

Advanced imaging technologies which include radiography, ultrasonography, computed tomography (CT) and magnetic resonance imaging (MRI) could be used in the diagnosis of lipomas. In the present case, only the first two modalities were used due to unavailability of CT and MRI. As mentioned previously, soft tissue swelling was the only radiographic finding in this case which is consistent with the findings reported by Thomson *et al.*¹ Ultrasonographically, canine lipomas have been described as having striped appearance, sharp edges and a thin hyperechoic capsule. This stripping appearance is thought to arise from the ingrowth of capsular connective tissue which then becomes fibrous tissue. The striated appearance which was also observed in the present case of intermuscular lipoma is considered as a sonographic feature of lipomas in dogs and humans.¹¹ CT and MRI allow a more accurate diagnosis and estimation of margins and extent of tumor infiltration. Crowley *et al.* have described CT characteristics of canine intermuscular lipomas as smoothly marginated, fat attenuating masses with minimal contrast enhancement and low vascularity causing separation of muscle bellies without infiltration into adjacent soft tissues or bones.⁶ Trebacz and Galanty have described MRI findings of canine intermuscular lipomas as homogenous, well circumscribed tumors which demonstrate a hyperintense signal on T1 weighted images and a relatively high signal on T2 weighted images with signal intensity being similar to subcutaneous fat without muscular or bony involvement.⁴ In humans, the MRI appearance of these tumors have also been described as masses having fat signal intensity with almost the same findings on both T1 and T2 weighted images.¹² Although imaging modalities particularly CT and MRI are useful for diagnosis and preoperative planning, but

histopathology is the gold standard for definitive diagnosis of intermuscular lipoma. The histological features of these tumors are identical to normal adipose tissue consisting of mature vacuolated cytoplasm with peripherally located nuclei without presence of any muscular fibers.^{12,13}

In conclusion, intermuscular lipoma should be suspected in elderly dogs with a progressively enlarging mass particularly in the hind limb with signs of lameness and they should be treated by surgical resection following diagnosis.

Acknowledgments

The authors would like to thank Mr. Yavar Heidarzadeh for his assistance and Mr. Ali Reza Rasooli for providing tissue sections.

Conflict of Interest

The authors report no conflicts of interest.

References

1. Thomson MJ, Withrow SJ, Dernell WS, Powers BE. Intermuscular lipomas of the thigh region in dogs: 11 cases. *Journal of the American Animal Hospital Association*, 1999; 35: 165-167.
2. Case JB, MacPhail CM, Withrow SJ. Anatomic distribution and clinical findings of intermuscular lipomas in 17 dogs (2005–2010). *Journal of the American Animal Hospital Association*, 2012; 48: 245-249.
3. Lamagna B, Greco A, Guardascione A, Navas L, Ragozzino M, Paciello O, Brunetti A, Meomartino L. Canine lipomas treated with steroid injections: clinical findings. *Plos One*, 2012; 7: 1-5.
4. Trębacz P, Galanty M. Sciatic neuropathy caused by an intermuscular lipoma in dogs. *Acta Veterinaria Brno*, 2016; 85: 147-149.
5. Huppés RR, Dal Pietro N, Wittmaack MC, Sembenelli G, Bueno CM, Pazzini JM, Jark PC, De Nardi AB, Castro JL. Intermuscular lipoma in dogs. *Acta Scientiae Veterinariae*, 2016; 44: 1-7.
6. Crowley JD, Hosgood G, Crawford NV, Richardson JL. Computed tomographic findings, surgical management and postoperative outcomes of large intermuscular lipomas in the hindlimb of 11 dogs. *Australian Veterinary Journal*, 2020; 98: 135-139.
7. Thilagar S, Toe I, Hii KL, Sheikh Omar AR, Ching TS. Benign intermuscular lipoma in a bitch. *Jurnal Veterinar Malaysia*, 2005; 17(2): 25-27.
8. Boston S. Musculoskeletal neoplasia and limb sparing surgery. In: Tobias KM, Johnston SA, eds. *Veterinary Surgery Small Animal*. 1st Edn. Elsevier, St. Louis, Missouri, USA, 2012; 1159-1177.

9. Liptak JM, Christensen NI. Soft tissue sarcomas. In: Vail DM, Thamm DH, Liptak JM, eds. *Withrow & Macewen's Small Animal Clinical Oncology*. 6th edn. Elsevier, St. Louis, Missouri, USA, 2020; 404-431.
10. Fletcher CD, Martin-Bates E. Intramuscular and intermuscular lipoma: Neglected diagnoses. *Histopathology*, 1988; 12: 275-287.
11. Volta A, Bonazzi M, Gnudi G, Gazzola M, Bertoni G. Ultrasonographic features of canine lipomas. *Veterinary Radiology and Ultrasound*, 2006; 47: 589-591.
12. Nishida J, Morita T, Ogose A, Okada K, Kakizaki H, Tajino T, Hatori M, Orui H, Ehara S, Satoh T, Shimamura T. Imaging characteristics of deep-seated lipomatous tumors: Intramuscular lipoma, intermuscular lipoma, and lipoma-like liposarcoma. *Journal of Orthopaedic Science*, 2007; 12: 533-541.
13. Hendrick MJ. Mesenchymal tumors of the skin and soft tissues. In: Meuten DJ ed. *Tumors in Domestic Animals*. 5th Edn. John Wiley & Sons Inc., Ames, Iowa, USA, 2017; 142-175.