Dorsal Paravertebral Intramuscular Lipoma: A Case Report

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Citation

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Abstract

Purpose: To present CT and MR findings in a case with dorsal paravertebral intramuscular lipoma and to discuss the differential diagnosis with well-differentiated liposarcoma.

Results: CT revealed a fat density mass lesion localized within the right paravertebral muscles without any bony destruction. MR images showed high signal lesion on both T1 and T2-weighted images and signal loss on fat supressed images. No contrast enhancement was detected. The lesion was extending towards the neural foramina nearby the right thoracal nerve radix anteriorly and protruding into the subcutaneous fatty tissue posteriorly. Histopathologic examination revealed a lipoma.

Conclusion: Intramuscular lipomas are relatively rare as compared with
all fatty soft tissue tumors; and paravertebral region is a rare location for intramuscular lipomas. The radiologic findings of intramuscular lipoma varies and sometimes cannot be distinguished from well-differantiated liposarcoma with imaging alone. Finally biopsy and histopathological examination is required to confirm the diagnosis.

INTRODUCTION

Benign lipomatous lesions involving soft tissues are common musculoskeletal masses. Soft-tissue lipoma accounts for almost 50% of all soft-tissue tumors. Radiological evaluation is diagnostic in up to 71% of cases ([1]). Benign lipomatous lesions may occur intramuscularly and intermuscularly which are relatively rare localizations comprising 1.8% and 0.3% of all fatty tumors respectively. Paravertebral region is an extremely rare localization for intramuscular lipoma.

Intramuscular lipoma most commonly occur in the 5-6th decades of life and men are affected more frequently than women. These lesions most frequently affect the thigh (50%), shoulder and upper arm ([2]). Because of large size, deep location and infiltrating growth pattern; the distinction between lipoma and well-differentiated liposarcoma is difficult. Typical benign tumors show a clear margin, however, the infiltrative growth of the lipomas mimic that of a malign tumor ([3]).

Well-differentiated liposarcomas often recur and must be treated with extensive excision. Both well-differentiated liposarcomas and lipomas have been reported to show magnetic resonance (MR) signal intensity equal to that of fat. In addition well-differentiated liposarcomas can have septa and nodular components consisting of nonadipose tissue on MR. Benign lipomas occasionally contain other mesenchymal elements mostly fibrous connective tissue which may appear as a thin septa with low signal on MR ([4]). In our study we report a case of intramuscular lipoma with a rare location in paravertebral region and discussed the computed tomography (CT) and MR features of the lesion. Also we discussed the differential diagnosis of this lesion with well-differentiated liposarcoma.

CASE REPORT

The patient was a 35 year old man who presented with a 3 month history of back pain. On physical examination there was no neurological deficit. The laboratory data revealed no abnormities. A CT examination was performed. CT revealed a fat density, lobulated, heterogenous hypodense mass lesion localized within the right paravertebral muscles without any bony destruction (Fig. IA, IB).

Figure 1

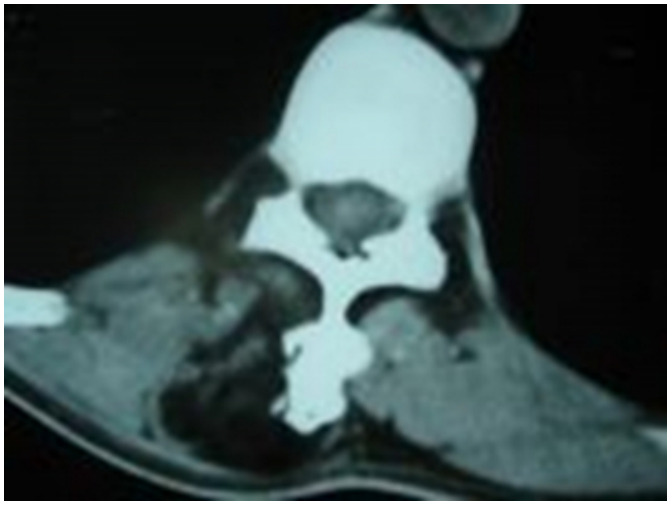
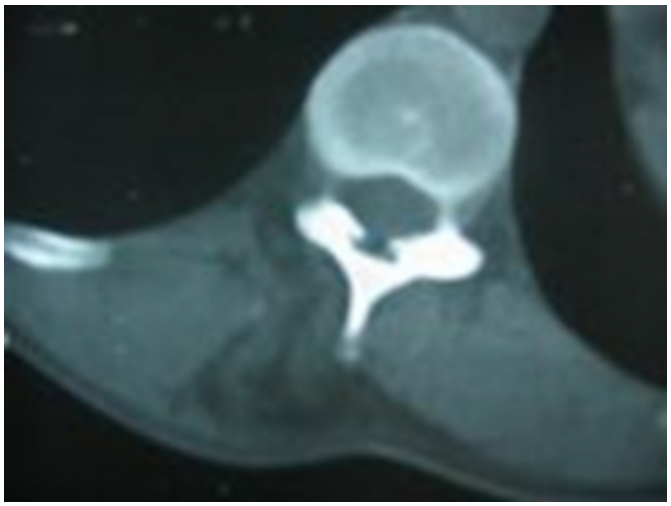


Figure 2



Then the patient underwent MR examination with 1.5 T (Signa, General Electric Medical Systems, Milwaukee, WI). On T1 (TR/TE:500/10) and T2- weighted (TR/TE:5000/104) axial images, the lesion was predominantly hyperintense including multiple low intensity muscle fibers and septa formations (Fig. IIA and IIB).

Figure 3

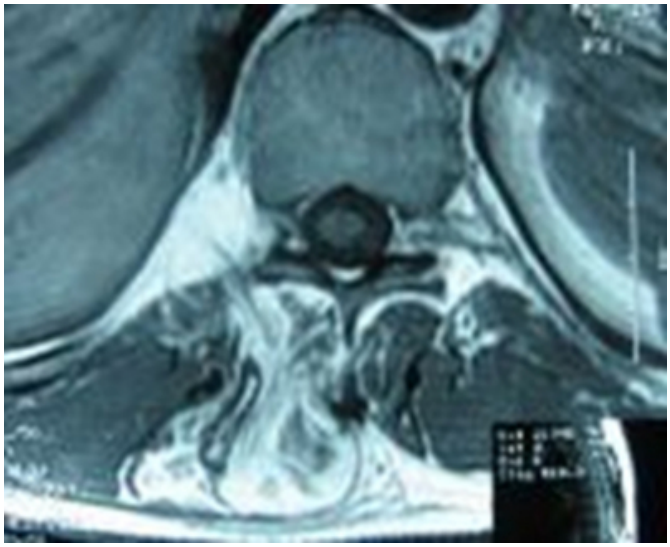
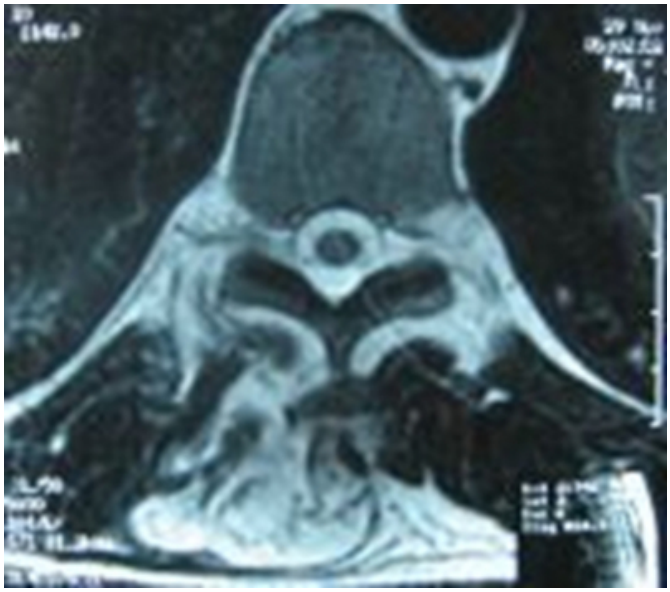


Figure 4

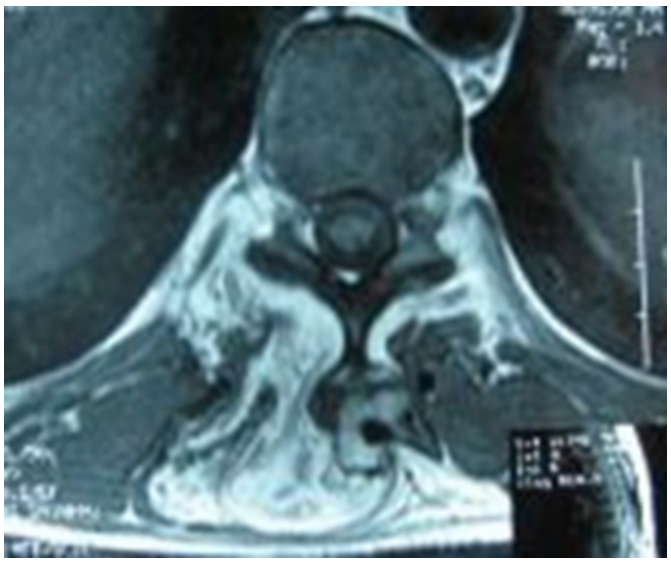


T2- weighted fat suppressed sagittal images showed signal loss in the lesion (Fig III).

Figure 5

After intravenous Gadopentetate dimeglumine administration, no contrast enhancement was detected (Fig IV).

Figure 6



The lesion was localized in the paravertebral muscles measuring approximately 6.5x4x4 cm, extending between 8th and 12th thoracal vertebras craniocaudally on the right side. T1 weighted sagittal image showed that the lesion was extending towards the neural foramina nearby the right thoracal nerve radix anteriorly and protruding into the subcutaneous fatty tissue posteriorly (Fig. V). An incissional biopsy was performed and a final diagnose with intramuscular lipoma was made histopathologically.

Figure 7

DISCUSSION

Lipoma is the most common type of soft tissue tumors. Solitary lipomas have been classified into two types; cutaneous/superficial and deep-seated/subfascial. In spite of some descriptions about superficial lipomas ([5]), little is known about the etiology or histogenesis of intramuscular lipomas, which are the deep-seated type.

An intramuscular lipoma could also be subdivided into infiltrative and well-circumscribed types ([6]), however, the factors contributing to these variations are not well understood ([3]). The mechanisms of their infiltrative growth are not fully understood, although it has been reported a possible role of aberrant high mobility group proteins

(HMGs) during the development of lipomatous tumors ([7,8]).

Intramuscular and intermuscular lipomas are relatively rare as compared to superficial lipomas, and have been reported to comprise 1.8% and 0.3% of all fatty tumors, respectively ([9]). Intramuscular lipoma (=infiltrating lipoma) most commonly occur in the 5-6th decades of life and men are affected more frequently than women. These lesions most frequently affect the thigh (50%), shoulder and upper arm ([2]).

Lipoma is a benign mesenchymal tumor in which the lesion closely resembles normal fat. The resemblance is so great that the fat within the lipoma cannot be distinguished histologically from normal fat; however, there are biochemical and ultrastructural differences. Well differentiated liposarcomas also resemble lipomas, although they tend to be larger, and are often transversed by dense bands of collagen, have gelatinous areas, and have adipocytes that show greater variation in size than an ordinary lipoma ([3]). Additionally, well-differentiated liposarcomas contain enlarged adipocytes, atypical hiperchromatic cells with angular nuclei, and lipoblasts ([3,10]). As there are histologic similarities between lipoma and well-differantiated liposarcoma, there are also considerable imaging similarities.

Typically benign lipomatous tumors show a clear margin, however, the infiltrative growth pattern of this tumors mimic that of a malignant one. The CT and MR images of patients with fatty masses are usually sufficiently characteristic to suggest their lipomatous nature and often allow a specific diagnosis. The distinction between lipoma and well-differentiated liposarcoma, however, is a frequent diagnostic dilemma ([10]).

Lipomas are well-defined, homogenous tumors with low attenuation on CT imaging. No enhancement is seen following intravenous contrast agent administration ([2]). In our case the hypodense fatty mass lesion was heterogenous due to the muscular fibers and thin septa formations within the mass which are defined as acceptable components of intramuscular lipomas in the literature. Although lipomas and well-differentiated liposarcomas are both grossly fatty masses, MR has been described as useful in attempting to distinguish these two lesions. Higher grade liposarcomas generally do not confound the MR diagnosis of grossly fatty lesions because they typically contain little or no macroscopic fat. Simple lipomas may contain a few thin, discrete septa, but they are otherwise homogeneously fatty masses. Bands of muscle fibers can be seen in intramuscular lipomas; but all other intralesional components are suspicion for well-differentiated liposarcoma. Thickened or nodular septa (generally > 2 mm), associated nonadipose masses, prominent foci of high T2 signal, and prominent areas of enhancement are all associated with increased risk of well differentiated liposarcoma. In our case thin septa formations within the lesion did not show contrast enhancement in postcontrast MR images. Simple lipomas can have a characteristic appearance on MR. A discrete, encapsulated, homogenous fatty mass is most certainly a simple lipoma. Simple lipomas, however, may also contain muscle fibers, blood vessels, fibrous septa, and areas of necrosis or inflammation. Infiltrative intramuscular lipomas are the exception to this description of lipoma. Although some intramuscular lipomas are homogenous fatty masses, others are heterogenous lesions with infiltrative margins and intermingled muscle fibers ([11]) like our case.

Two prior study have shown that infiltrative margins suggest the diagnosis of benign intramuscular lipoma rather than that of well-differentiated liposarcoma ([4,12]).

Matsumoto et al. reported that an infiltrative nature, which is a general characteristic of an malignant tumor, indicates benignity and not malignancy in an intramuscular (infiltrating) lipoma. Multinodular margins were frequently recognized in well differentiated liposarcomas, and uninodular margins were seen in benign lipomas with statistical significance ([12]).

Ohguri et al. also reported intramuscular lipoma with the margins were entirely irregular at all points where the neoplastic fatty tissue infiltrated and intermingled with the surrounding muscle tissue. They showed that the septal enhancement pattern on contrast enhanced MR images may helpful in distinguishing lipoma from well-differentiated liposarcoma than septa thickness ([4]).

In Gaskin and Helms evaluated 126 consecutive grossly fatty masses using standard published criteria, and the success of MR in evaluating a fatty mass for well-differentiated liposarcoma was among as sensitivity, 100%; specificity, 83% ; accuracy, 84%; positive predictive value, 38%; and negative predictive value, 100%. They found MR to be 100% specific for the diagnosis of simple lipoma when standard imaging criteria were used ([11]).

The long-term prognosis and initial operative management of simple lipomas and well-differentiated liposarcomas are

different. Simple lipomas are often successfully treated by local or marginal excision, whereas well differentiated liposarcomas are are preferentially treated with local excision because of their high rate of local recurrence ([11]).

MR is useful, but imperfect, in distinguishing lipomas, lipoma variants, and well-differentiated liposarcomas. The MR findings of intramuscular lipoma varies from a small, single and homogeneous mass identical to ordinary (superficial) lipoma, to a large, inhomogeneous lesion with an infiltrative margin ([12]). CT and MR examinations showing discrete, homogenous, fatty mass can be considered diagnostic of a simple lipoma but intramuscular lipomas are also able to have similar radiological appearance mostly including some muscle fibers and thin, non-enhancing septa formations. Such lipomas cannot be distinguished from well-differentiated liposarcoma with imaging alone. Finally biopsy and histopathological examination is required to confirm the diagnosis.

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