

## Case Report

# Giant Intermuscular Lipoma of the Posterior Arm Compartment: Case Report and Literature Review

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## Abstract

Lipomas are common benign soft tissue tumors. When a lipoma has more than 5 cm it is classified as a giant lipoma. Upper extremity giant lipomas are rare entities with small case series and few case reports published to date. In this article we describe a case of a patient with a rare form of a giant intermuscular lipoma located in the posterior arm compartment that underwent surgical treatment. We also reviewed the literature respective to this condition. High risk features for malignancy and common indications for surgery are discussed, despite lack of clear guidelines on the appropriate management and follow up of these patients.

**Keywords:** Giant lipoma; Soft tissue tumor; Intramuscular; Triceps brachii

## Introduction

Lipomas are benign soft tissue tumors composed of mature adipose cells [1]. The most common are located in the subcutaneous fat layer [2] and comprise about 50% of soft tissue tumors [3]. Less frequently, lipomas can extend through deep soft tissue, in subfascial location, where they are usually larger and classified as intramuscular or intermuscular [2,4].

When a lipoma has more than 5 cm in any dimension it is categorized as a giant lipoma [5]. Particularly, giant lipomas of the arm only have few case reports [2,3,6-9] and small case series published to date that we are aware of [1,10-12].

In this article we report a case of a giant intermuscular lipoma in the posterior arm compartment, located between the heads of triceps brachii muscles with intimate communication with radial nerve, contouring the dorsal surface of the humerus and reaching the major neurovascular structures in the medial arm.

## Case Presentation

A 74-year-old woman was referred to our department because of a slow growing, painless mass in the posterior surface of her right arm. The patient complained of right arm discomfort and expressed concern about the expansive nature and dimensions of the mass. Other symptoms such as irradiating pain, paresthesia or muscle weakness were absent.

On physical examination she had an apparently deep located mass over the posterior surface of her right arm extending superiorly to the insertion of the deltoid muscle and inferiorly to the level of the origin of triceps brachii muscle tendon. No signs of cutaneous changes or muscle atrophy were identified. Forearm and hand motor function and sensibility were preserved.

An upper right limb CT scan and an aspiration biopsy were performed. Figure 1 depicts CT scan views. The lesion had 15 cm in its largest dimension and a density compatible with lipomatous tissue. According to these radiological findings a diagnostic hypothesis of lipoma or liposarcoma was proposed.

Also, in the CT scan a small lobule of tumor appeared to pierce through the posterior surface of the radius closely communicating with the main neurovascular bundle of the upper extremity. Needle aspiration biopsy was performed showing mature adipose cells without atypia or signs of malignancy, supporting the diagnosis of lipoma.

Surgery was performed under general anesthesia, through a dorsal arm approach with a lazy-S incision. A well-circumscribed lipomatous heart-shaped mass was isolated between muscular masses of triceps heads as shown in Figure 2. The tumor was resected en bloc without the need for tedious dissection from the neurovascular structures, whose integrity was confirmed after completion of the excisional procedure. Two suction drains were left in place, one in the intermuscular space and the other subcutaneously.

There were no specific complications during surgery or in the immediate post-operative period. A right arm neuromuscular examination was performed to exclude immediate post operative sequelae and the patient was discharged two days after the procedure.

Definite histopathological examination confirmed the diagnosis of a 476 g lipoma with 16.5 cm × 9.5 cm × 5 cm and the follow-up during the first year showed no signs of recurrence (Figure 3).

## Literature Review

Literature regarding similar cases of giant arm lipomas in the past two decades was reviewed. Through Medline/Pubmed database we entered the search terms “giant lipoma of the upper extremity” which

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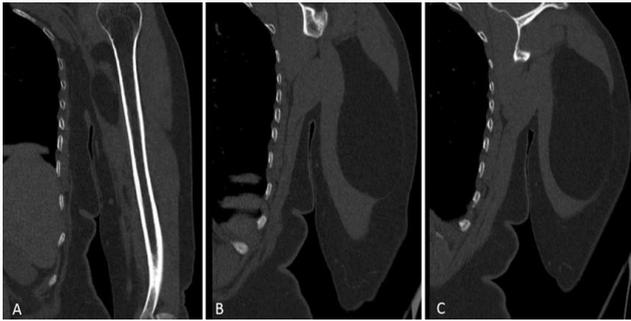


Figure 1: A-C): CT-scan, coronal view.



Figure 2: A, B): CT scan, axial and coronal views, respectively. Soft tissue enhancement, on the left, the black arrow indicates de location of the radial nerve; the white arrow identifies an indentation-like feature of the tumor through which it stays in proximity with the major neurovascular bundle to the upper extremity (arrowhead).

led to 74 entries and the terms “arm giant lipoma” with 18 entries. The terms “triceps brachii lipoma” identified 1 additional article.

Articles referring to lipomas exclusively located in hand, forearm and axilla/shoulder were excluded as well as articles whose tumor size was not reported.

Through the references of selected articles, additional case series and reports were identified. A total of nine articles were identified describing giant lipomas of the upper extremity whose data is summarized in Tables 1 and 2.

### Discussion

We present a case of a giant lipoma in the posterior arm

compartment that raised our interest because of its dimensions and its behavior with an evagination into the anterior arm compartment in proximity with neurovascular structures in the medial arm.

We have found some similarities with the case reported by Sri et al. [3] that describes an intercompartmental giant lipoma of the arm with dimensions roughly half the size of the tumor we describe here.

The vast majority of lipomas are small subcutaneous benign neoplasms and surgical resection is not mandatory if there are no suspicious features [2].

However, some clinical characteristics of lipomas may warrant a further diagnostic work-up to rule out malignancy. Two of such characteristics, a size larger than 5 cm and the subfascial location were present in the case we describe here. Pain and rapid growth comprise other characteristics that may be present and increase the likelihood of malignancy [13].

Clear guidelines to the appropriate management of this benign tumors are not well established but most reports state that any upper extremity mass should at least undergo imaging to document and follow up the behavior of these lesions [2].

In cases where a giant lipoma of the upper extremity is suspected, MRI or CT scan is the preferred image modalities to characterize the lesion. MRI has the potential advantage of a better characterization of soft tissue and reveals some functional characteristics that may help differentiate between benign and malignant tumors. For example, an inhomogeneous sign, septa >2 mm [14] or the presence of linear or nodular foci of hyperintensities on FS-T2/STIR sequences are more specific signs of malignancy in MRI and a biopsy is indicated [15]. Elbardouni et al. [1] suggests to systematically performing an MRI and incisional biopsy for all deep tumors bigger than 5 cm and excisional biopsy for tumors smaller than 5 cm that does not have MRI features of malignancy.

We didn't perform an MRI scan in this case because the CT scan images satisfactorily characterized the lesion, showing a well circumscribed lipomatous mass and there were no clinical signs or symptoms raising concern about direct involvement of neurovascular structures despite the proximity demonstrated. Also, because of the dimensions and location of the mass, surgery would be recommended by the radiologist even if an MRI showed no suspicious features.

Common indications for surgery of soft tissue tumors include a patient that is symptomatic with mass pain, compressive neuropathy or aesthetic concerns [16]. Tumor factors that favor surgery include a



Figure 3: Intraoperative photographs of tumor excision.



**Figure 4:** Post operative evaluation 3 months after surgery, showing the incision scar and a near normal arm contour with no functional limitations.

**Table 1:** Case series of upper limb giant lipomas reported in the literature in the past 20 years. N/A: non- available.

	Elbardouni A et al. [1]	Allen B et al. [10]	Costea R et al. [11]	Verge Schulte-Eversum, J. et al. [12]
N	13	8	8	2
Gender (ratio Male : Female)	3:10	4:04	3:05	2:00
Age, years (mean [range])	53 [30-59]	53 [15-70]	55 [17-77]	62 and 51
<b>Location</b>				
Axilla/Shoulder	1	2	3	
Arm	7	1	4	2
Elbow	0	1	0	
Forearm	5	4	1	
Hand	0	0	0	
Size in greatest dimension, cm (mean [range])	8.5 [5.0-20.0]	8.5 [4.0-14.0]	12.6 [5.0-34.0]	N/A
<b>Symptoms (n)</b>				
Painless swelling	9	6	3	0
Mass pain	1	1	N/A	0
Mass paresthesia	1	0	N/A	0
Radial nerve palsy/paresthesia	1	0	N/A	2
Median nerve palsy/paresthesia	1	0	N/A	0
Ulnar nerve palsy/paresthesia	0	1	N/A	0
Abduction limitation	1	0	N/A	0
Malignancy	0	1	1	0
Recurrence	0	1	0	N/A
Follow-up, years (mean [range])	3.0 [2.0 - 5.0]	N/A	N/A	N/A

**Table 2:** Isolated case reports of arm giant lipomas reported in the literature in the past 20 years.

	Toft F [2]	Papakonstantinou PE, et al. [6]	Xu X, et al. [9]	Lahrach K, et al. [8]	Kinoshita R, et al. [7]
Age, years	71	86	24	50	74
Gender (M: male, F: female)	M	M	M	N/A	F
Size in greatest dimension, cm	7	19.5	14	8	45
Symptoms	Painless mass	Mass Pain	Painless mass	Painless mass	Painless mass
Malignancy	No	No	No	No	No
Recurrence	N/A	No	No	N/A	No
Follow-up, months)	N/A	6	48	N/A	20

N/A: Non- Available

size >5 cm, subfascial location, infiltrative growth pattern or recurrent disease [17,18].

Surgery is generally accepted as the treatment of choice for giant lipomas in the upper extremity with a post operative low morbidity and allowing for resolution of compressive symptoms. Pathological analysis of the entire specimen provided by marginal excision of these lesions is the only procedure that can reliably prove the benign nature of these tumors. However, if conservative management is to be chosen at least a regular imaging follow-up is recommended [2].

The long-term prognosis seems favorable after surgery but

the appropriate timing for follow up of this patient remains largely unknown and a matter of investigation.

### Conclusion

Despite the lacking algorithms to the management of lipomas of the upper extremity, giant lipomas should raise awareness especially if other of the previously listed features that increase the chance of malignancy are present.

Once surgical resection is warranted, detailed knowledge of upper extremity anatomy and careful intraoperative dissection are mandatory for a complete exenteration without iatrogenic complications.

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