

## Giant lipomas of the upper extremity

### Üst ekstremitte yerleşimli dev lipomlar

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Dergiye Ulaşma Tarihi: 27.02.2016 Dergiye Kabul Tarihi: 11.04.2016 Doi: 10.5505/aot.2016.37450

#### ÖZET

**GİRİŞ ve AMAÇ:** Lipomlar en sık görülen yumuşak doku tümörleri olup özellikle omuz, sırt ve alt ekstremitede görülmektedir. Nadir görülmekle birlikte 5 cm' in üzerinde olanlar ise dev lipom şeklinde tanımlanmaktadır. Yazımızda tanı ve tedavide sıkıntılara yol açabilecek üst ekstremitte yerleşimli dev lipom nedeniyle cerrahi tedavi edilen olgular literatür eşliğinde sunulmuştur.

**YÖNTEM ve GEREÇLER:** Mart 2009 ile Aralık 2014 tarihleri arasında üst ekstremitte yerleşimli dev lipom nedeniyle cerrahi total eksizyon uygulanmış ve son kontrolleri yapılan 17 olgu çalışmaya dahil edildi. Hastalar yaş, cinsiyet, lokalizasyon, cerrahi yaklaşım, histopatolojik özellik ve nüks açısından değerlendirildi. Veriler SPSS sistemine yüklendikten sonra normal dağılıma uyup uymadığı Shapiro-Wilk testi ile değerlendirildi.

**BULGULAR:** Olguların 7'si kadın, 10'u erkek ve ortalama yaşı 44 (8-81) idi. Lezyon olguların 4'ünde el, 4'ünde önkol, 3'ünde kol ve 6'sında omuz bölgesinde, sağ/sol yerleşimi ise 12/5 şeklinde idi. Olguların ortalama takip süresi 42 ay (9-84) idi. Takiplerinde el yerleşimli bir olgumuzda 22. ayda nüks geliştiği gözlemlendi ve kitleye cerrahi olarak re-eksizyon uygulandı.

**TARTIŞMA ve SONUÇ:** Sonuç: Lipomların kesin tedavisi cerrahi olarak total eksizyondur. Bunun için özellikle üst ekstremitte yerleşimli lipomlarda tüm sınırlara ulaşmak ve komşu nörovasküler yapıları korumak için yeterince geniş insizyon kullanılmalıdır.

**Anahtar Kelimeler:** Lipom, Dev lipom, Üst ekstremitte, Total eksizyon

#### ABSTRACT

**INTRODUCTION:** Lipomas are the most frequently seen soft tissue tumors and are seen particularly in the shoulder, back and lower extremity. Although rarely seen, lipomas of >5 cm are known as giant lipomas. In this paper, cases treated surgically due to giant lipoma located in the upper extremity, which can lead to problems in diagnosis and treatment, are presented in the light of current literature.

**METHODS:** The study included 17 cases that underwent surgical total excision for giant lipoma located in the upper extremity and underwent final follow-up examination between March 2009 and December 2014. Patients were evaluated in point of age, gender, localization, surgical approach, histopathological characteristics and recurrence. Data were evaluated to confirm normal distribution using the Shapiro-Wilk test.

**RESULTS:** The patients were 7 females and 10 males with a mean age of 44 years (ranging from 8 to 81 years). The lesions were in the hand in 4 cases, in the arm in 3 cases and the shoulder region in 6 cases, with right/left location in 12/5 cases. The mean follow-up period was 42 months (ranging from 9 to 84 months). In one case, recurrence was seen at 22nd month and surgical re-excision of the mass was applied.

**DISCUSSION and CONCLUSION:** The definitive treatment for lipomas is surgical total excision. To achieve this, particularly in lipomas located in the upper extremity, a sufficient wide incision must be used to reach all the nerves and protect the neurovascular structures.

**Keywords:** Lipoma, Giant lipoma, Upper extremity, Total excision

#### Introduction

Lipomas are the most frequently seen soft tissue tumors and originate from the mesenchymal tissue (1). Generally, they have regular borders and are separated from the surrounding soft tissue with a connective tissue

capsule. Location is often in the back and shoulder region, and may be subcutaneous (superficial) or between the muscle tissues (deep) (2, 3). Although the etiology is not fully known, it has been suggested that trauma, obesity and female gender trigger formation or growth of the mass (4). Lipomas are slow

growing and some of them that is over 5 cm in size known as giant lipomas although they are rarely seen (5).

Masses are generally painless and asymptomatic but when they are close to the skin or create pressure on neighboring anatomic structures, symptoms might be seen. Although many studies have been conducted on lipomas, there are very few which have examined giant lipomas in the upper extremity (6, 7). In this paper, cases treated surgically due to giant lipomas located in the upper extremity that can lead to problems in diagnosis and treatment, are presented in the light of current literature.

### Material and Method

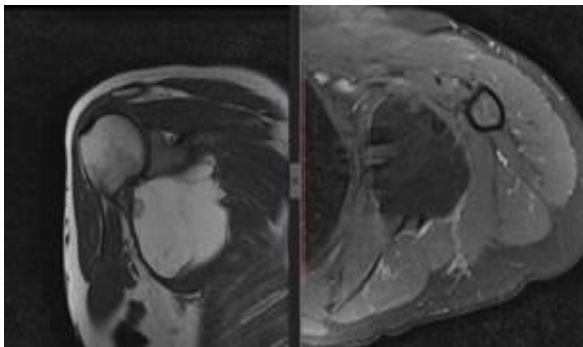
The study comprised of 17 patients, surgically treated for a lipoma >5 cm in size located in the upper extremity, which was confirmed histopathologically between March 2009 and December 2014. All patients attended a final follow-up examination. Evaluation of the patients was made in respect of age, gender, localization, surgical approach, histopathological features and recurrence. According to the clinical complaints, direct radiography (X-ray), ultrasonography (USG) and/or magnetic resonance imaging (MRI) were applied. To be able to better evaluate lesions with a deep location adjacent to bone and with a heterogeneous appearance on MRI,

computed tomography (CT) was applied. In addition, electromyographical (EMG) records also evaluated for monitorisation in some cases. In the postoperative follow-up USG or MRI was used.

In statistical analysis, Shapiro-Wilk test was used to determine normality. Data stated as mean  $\pm$  standard deviation and median (min-max) with normal and non normal distribution respectively.

### Results

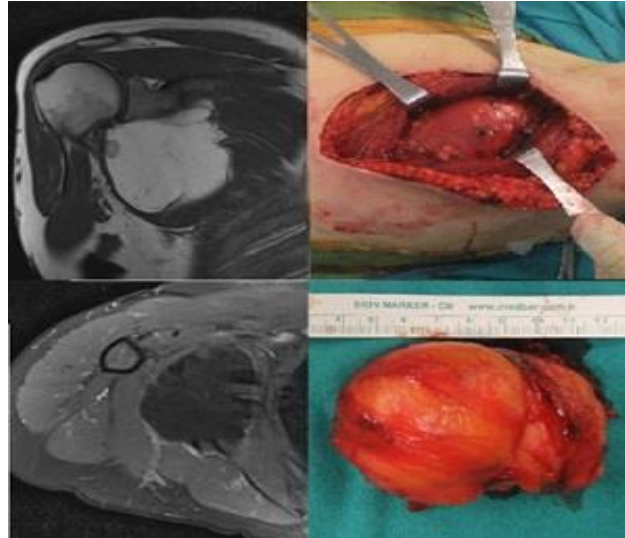
The patients were 7 females and 10 males with a mean age of 44 years (ranging from, 8 to 81 years). The lesions were in the hand in 4 cases, in the arm in 3 cases and the shoulder region in 6 cases, with right/left location in 12/5 cases (Table 1). No biopsy was made of lesions, which were radiologically confirmed as lipoma. Tru-cut biopsy was applied to only 2 patients because of the heterogeneous appearance and septal thickness of the lesion (Figure 1). In patients with involvement of two compartments in the forearm, a volar and dorsal double incision was used (Figure 2). In 2 patients, localization was in the axillary region (Figure 3). The mean follow-up period was 42 months (ranging from 9 to 84 months). In one case with location in the hand, recurrence was seen to have developed in the 22<sup>nd</sup> month and surgical re-excision of the mass was applied.



**Figure 1:** Heterogeneous appearance of the axillary area on MRI.



**Figure 2:** Lipoma with forearm volar and dorsal compartment localization.



**Figure 3:** Lipoma with axillary region localization.

**Table 1:** Features of patients.

Case number	Age (years)	Gender	Affected side	Location
1	29	Female	Left	Forearm
2	81	Female	Right	Hand
3	60	Male	Right	Shoulder
4	30	Female	Right	Hand
5	31	Female	Right	Forearm
6	80	Male	Right	Hand
7	38	Male	Right	Shoulder
8	44	Female	Right	Shoulder
9	40	Female	Right	Shoulder
10	52	Male	Right	Shoulder
11	8	Male	Left	Forearm
12	51	Male	Right	Forearm
13	44	Male	Right	Arm
14	53	Male	Left	Shoulder
15	52	Male	Right	Arm
16	36	Female	Left	Hand
17	46	Male	Right	Arm

## Discussion

Lipoma is the most frequently seen soft tissue tumor and is seen especially in the shoulder, back and on the posterior surface of the lower extremity. Most reports are related to lower extremity location and studies regarding upper extremity located lipomas are involved in single case reports with the lack of comprehensive evaluation (7-9).

Generally, lipomas are <2-3 cm in size and are rarely bigger than this. When the size is >5 cm, they are accepted as giant lipomas and may be confused clinically and radiologically with atypical lipomatosis tumor or well-

differentiated liposarcoma (5, 10). In cases where giant lipomas are not removed together with the capsule, it can be seen either increased risk of local recurrence and difficulty of re-excision (11). In the current series, all the masses were >5 cm in size unless observation of malignant transformation.

Liposarcoma is the most frequently seen malignant soft tissue tumor that can be encountered mostly in between the 4th-6th decades of life (12). The risk of malignant lipoma increases when there is deep location, onset of pain in a previously painless mass >5 cm in size and a heterogeneous appearance on MRI (12, 13). In the current study, there was a

palpable swelling in 10 patients, including 2 with complaints of pain. In other 7 patients (with arm, forearm and axillary region location), although there was a deep feeling of swelling and fullness, they had no any complains since the lack of palpable swelling evident which resulted in delay in diagnosis and treatment.

Although the etiology of lipomas has not been clarified, trauma and obesity have been thought to create a risk (14, 15). In the current cases, because of location on the volar surface and proximity to the muscles providing the flexion-adduction movement, the mass can be considered to have occurred with friction or the interaction of the fascia and the continuously contracting muscle rather than directly from an external trauma.

Lipomas are seen more in females than males (5). However, in the current cases there were seen to be more males. As the location of the mass was in the upper extremity, the formation of the mass may have been triggered by the use of the arm in work undertaken by males, which requires more strength, or exposure to trauma. Although lipomas are generally seen alone, there may occasionally be several and may accompany lipomatosis or syndromes such as Gardner (16, 17).

Lipomas are generally painless due to slow growth and the absence of spread to surrounding tissues. Depending on the mechanical pressure in the anatomical location, nerve entrapment and impingement syndrome may lead to symptoms (18-21). In particular, when there is proximity to the nerve, neurological symptoms such as numbness, burning, tingling and weakness may be noticed early. Clinical symptoms are expected in lipoma, which develops in close proximity to neurovascular structures, especially in the upper extremity. In the current study, only one case had neurological symptoms in the preoperative period. However, evaluation was made with EMG for monitorisation in some cases of the current study. With the exception of the one patient with pre-operative neurological symptoms, no postoperative neurological deficit was seen in any patient and this information has not been seen in literature. Despite both pre-operative and intra-operative trauma to the nerves adjacent to giant lipoma, that no neurological deficit developed can be interpreted as the nerve having

developed resistance to these slow-growing types of masses and thus the nerve communication and feeding is not disrupted. A neurological deficit may develop during surgical fixation following bone fractures due to nerve damage even if the condition of slight tension.

Although the most common complaint in cases of lipoma is palpable swelling, as this swelling is generally occur in between deep tissues, it is generally noticed late (8). In 6 patients of the current study with forearm and axillary location, despite feelings of tenseness, fullness and swelling for long time, there was no evident pain and any imaging methods additional to x-ray were examined which lead to late diagnosis. Although direct radiography is the imaging method used first by orthopedic surgeons, it rarely gives sufficient information for diagnosis in cases of lipoma. The first test required in cases of palpable soft tissue swellings is USG, which can be applied easily as it is cheap, simple and non-invasive. MRI is the most valuable imaging method in the diagnosis of lipoma and should be the first imaging method used after USG in patients having swelling and feeling of tension (12). MRI shows the tissue content, dimensions and relationship with surrounding soft tissues and is useful in planning surgical treatment.

Lipomas must be removed totally (4, 22). Careful surgical exploration is required as the compartments of the upper extremity are relatively smaller and because of neurovascular proximity. In 2 cases with forearm volar and dorsal location in the current study, a double incision was preferred to protect the neurovascular tissues and to remove the mass entirely with the capsule.

Even though there many morphological variants of lipoma have been described according to the presence of additional mesenchymal components such as angiolipoma, myxolipoma and fibrolipoma, classification is of separate prognostic importance. Especially in lipoma with a deep location, it is important that differentiation can be made from atypical lipomatosis tumor and well-differentiated liposarcoma, which closely resemble lipoma. Especially in tumors of large diameter, with irregular contours and heterogeneous and sclerotic appearance, the pathologist must be informed in respect of the

radiological and clinical characteristics (23, 24).

In conclusion, the definitive treatment for lipomas is surgical total excision. Particularly in lipoma located in the upper extremity, a sufficiently wide incision must be used to reach all the nerves and protect the neurovascular structures. In cases of large, deeply located masses with heterogeneous appearance on MRI, the pathologist must be informed in detail.

**Conflict of interests:** The authors declare that they have no competing interests.

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