Research Article / Araştırma Makalesi
doi: 10.18678/dtfd.1068051

Duzce Med J, 2022;24(2):126-130
Düzce Tıp Fak Derg, 2022;24(2):126-130

Clinical Results of Surgical Treatment of Giant Lipomas: A Single-Center Experience

Dev Lipomların Cerrahi Tedavisi Sonrası Klinik Sonuçlar: Tek Merkez Deneyimi

Ayşe Nur TOKSÖZ YILDIRIM[1]
0000-0003-1708-0003
Tulay ZENGİNKİNET[1]
0000-0003-3056-2074
Erhan OKAY[2]
0000-0003-2443-2505
Arda AKKAYA[2]
0000-0002-5378-4457
Korhan ÖZKAN[2]
0000-0002-3755-1813

[1]Department of Medical Pathology, Göztepe Prof. Dr. Süleyman Yalçın City Hospital, İstanbul, Türkiye

[2]Department of Orthopedics and Traumatology, Göztepe Prof. Dr. Süleyman Yalçın City Hospital, İstanbul, Türkiye

Corresponding Author
Sorumlu Yazar
Erhan OKAY
erhanokay@yahoo.com

Received / Geliş Tarihi : 04.02.2022
Accepted / Kabul Tarihi : 29.05.2022
Available Online / Çevrimiçi Yayın Tarihi : 11.07.2022

ABSTRACT

Aim: Lipomas are benign tumors, and generally present as small lesions. However, giant lipomas are less frequent. There are only a few studies regarding the surgical treatment of giant lipomas. Marginal or wide resection is usually performed; however, there is no standard surgical approach. The aim of this study was to evaluate clinical results after surgical treatment of giant lipomas and to present a differential diagnosis of lipomatous lesions.
Material and Methods: A total of 42 cases (24 female, 18 male) admitted to our clinic between 2015 and 2020 due to giant lipoma with at least 10 cm dimensions were included in this study. A preoperative biopsy was performed for all cases. All patients were undergone wide excision followed by postoperative histopathological examination.
Results: The mean age was 57.5±12.9 years. The median follow-up was 35 months. Anatomic localization was thigh in 16 (38.1%) patients, shoulder in 7 (16.7%) patients, hip in 5 (11.9%) patients, back in 4 (9.5%) patients, arm in 9 (21.4%) patients, and the iliac region in 1 (2.4%) patient. Wide resection was performed, and final pathology was consistent with lipoma in all cases. There was no complication except in one patient who had transient neuropraxia after removing a giant lipoma at the proximal femur. At the latest follow-up, all cases were asymptomatic with no recurrence.
Conclusion: Preoperative biopsy and wide resection should be preferred for the diagnosis and treatment of giant lipomas. Wide resection may prevent a recurrence. Routine follow-up is necessary to detect possible malign transformation.
Keywords: Giant lipoma; wide resection; benign tumors.

ÖZ

Amaç: Lipomlar iyi huylu tümörlerdir ve genellikle küçük lezyonlar olarak ortaya çıkar. Ancak dev lipomlar daha az sıklıkta görülür. Dev lipomların cerrahi tedavisi ile ilgili çok az sayıda çalışma bulunmaktadır. Marjinal veya geniş rezeksiyon genellikle uygulanmaktadır; ancak standart bir cerrahi yaklaşım yoktur. Bu çalışmanın amacı, dev hücreli lipomların cerrahi tedavisi sonrası klinik sonuçlarını değerlendirmek ve lipomatöz tümörlerin ayırıcı tanısını sunmaktır.
Gereç ve Yöntemler: Bu çalışmaya 2015 ve 2020 yılları arasında en az 10 cm çapında dev lipom nedeniyle kliniğimize başvuran toplam 42 olgu (24 kadın, 18 erkek) dahil edildi. Tüm olgulara ameliyat öncesi biyopsi uygulandı. Tüm hastalara geniş eksizyon yapıldıktan sonra postoperatif histopatolojik inceleme yapıldı.
Bulgular: Ortalama yaş 57,5±12,9 yıl idi. Ortanca takip süresi 35 aydı. Anatomik yerleşim 16 (%38,1) hastada uyluk, 7 (%16,7) hastada omuz, 5 (%11,9) hastada kalça, 4 (%9,5) hastada sırt, 9 (%21,4) hastada kol, 1 (%2,4) hastada iliak bölge idi. Geniş rezeksiyon yapıldı ve nihai patoloji sonucu tüm hastalarda lipom ile uyumluydu. Proksimal femurda yerleşimli dev lipomun çıkarılmasından sonra bir hastada geçici nöropraksi görülmesi dışında başka bir komplikasyona rastlanmadı. Son kontrolde, tüm hastalar asemptomatikti ve nüks görülmedi.
Sonuç: Dev lipomların teşhisinde ameliyat öncesi biyopsi ve tedavisinde geniş rezeksiyon tercih edilmelidir. Geniş rezeksiyon rekürrensi önleyebilir. Muhtemel malign transformasyonun tespit edilmesi için rutin takip gereklidir.
Anahtar kelimeler: Dev lipom; geniş rezeksiyon, iyi huylu tümör.

INTRODUCTION

Lipomas are the most common benign mesenchymal tumors. Its prevalence is 2.1 per 1000 people. Most of the lipomas are located in the subcutaneous tissue and present as a small mass, usually less than 2-3 cm. A giant lipoma refers to a lesion that should be at least 10 cm in axial or coronal dimension or weigh a minimum of 1000 g. These types of lipomas can cause compression to adjacent anatomic structures (1). Giant lipomas are rarely presented in the English-speaking literature, with usually case reports or series (1-9). The choice to prefer wide or marginal resection is variable (10).

They may be predisposed to diagnostic challenges both radiologically and pathologically. Differential diagnoses from sarcoma are of utmost importance to put forward the appropriate treatment strategy. So, in this manuscript, we aimed to present our patients treated surgically for their giant cell lipomas between 2015 and 2020 in a tertiary reference center of orthopedic oncology center in the light of current literature and to present a differential diagnosis of lipomatous lesions which have been very rarely presented in the English-speaking literature.

MATERIAL AND METHODS

Our study cohort consisted of 42 patients who were surgically treated for their giant lipomas with a size of more than 10 cm in appendicular and axial skeleton between the dates of 2015 and 2020 in a tertiary orthopedic oncology referral center (Istanbul Medeniyet University Göztepe Prof. Dr. Süleyman Yalçın City Hospital) detected from the musculoskeletal oncology database of our pathology unit. All lesions were undergone preoperative biopsy and wide excision followed by postoperative histopathological examination. This study was approved by the ethics committee of the İstanbul Medeniyet University (dated 16.06.2021, numbered 319). Age, gender, anatomical localization, histopathological features of the lesions, and follow-up time were noted. All patients had a preoperative X-ray and magnetic resonance imaging (MRI) examination. The diagnosis was confirmed with a preoperative biopsy in all of our patients. Patients were followed up every six months for the first two years and then yearly with contrast-enhanced MRI examination for recurrence.

All patients with at least one year of follow-up and adequate radiologic imaging were included in the study.

Surgical Technique

In all cases, wide resection was performed to decrease the recurrence rate with a cuff of normal tissue surrounding the tumoral lesion with paying attention to neurovascular structures. We opt not to perform marginal resection which involves dissection and removal of the tumor through the pseudocapsule or peritumoral reactive tissue (11).

Statistical Analysis

Descriptive statistics were given as mean, standard deviation, and minimum-maximum values for numerical variables. Categorical variables were summarized as numbers and percentages.

RESULTS

The study included 42 cases, 24 (57.1%) of whom were female, and 18 (42.9%) were male. The mean age of the patients was 57.5±12.9 (range, 28-87) years. The median follow-up was 35 (range, 2-66) months. Anatomic localization of the lesions were thigh in 16 (38.1%) patients, shoulder in 7 (16.7%) patients, hip in 5 (11.9%) patients, back in 4 (9.5%) patients, arm in 9 (21.4%) patients, and the iliac region in 1 (2.4%) patient. Preoperative tru-cut biopsy was performed in all patients due to the size of the lesions.

Wide resection was performed in all patients. There was no complication except in one patient who had neuropraxia of the femoral nerve after removing a giant lipoma at the proximal femur.

Postoperative histopathological examination was also performed for all patients confirming the diagnosis.

A representative case was demonstrated in Figure 1. The intraoperative view demonstrates the lesion abutting the radial nerve (Figure 1a). After resection, the macroscopic view demonstrated well-circumscribed tumors with a uniform glistening yellow to pale cut surface (Figure 1b).

Histological examination of lipomas is a well-differentiated lipomatous proliferation composed of mature adipocytes. Fibrous septa may be present, but atypical hyperchromatic stromal cells are absent (Figure 1c). Fat necrosis and dystrophic calcification, especially in large deep-seated tumors, may be seen (Figure 1d). Lipomas which contain nodules of metaplastic bone or cartilage are termed osteolipoma or chondrolipoma. Immunohistochemical examination shows positive staining with sS-100 and HMGA 2. No staining was detected with MDM2 and CDK4.

Demographic and clinical findings of the cases including the localization and size of the tumoral lesions were given in Table 1 and Table 2.

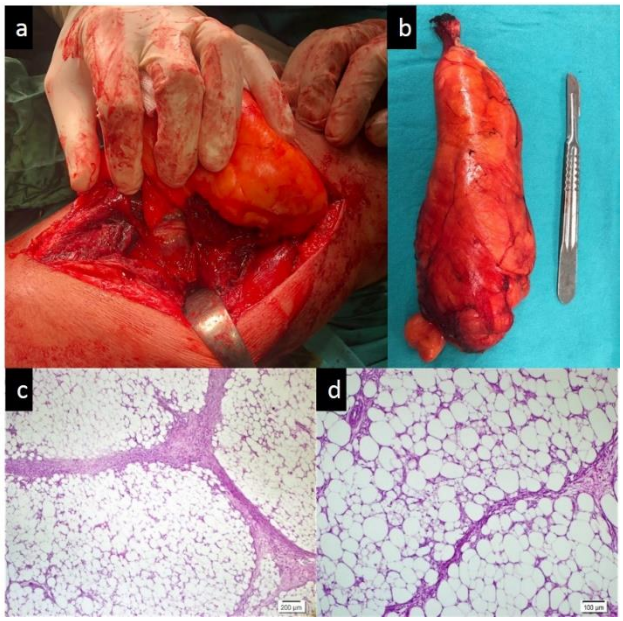

Figure 1. a) The lesion is abutting the radial nerve. **b)** Macroscopic view demonstrates well-circumscribed tumors with a uniform glistening yellow to pale cut surface. **c)** Microscopic view shows the giant lipoma composed of multiple lobules of mature fat cells separated by fibrous septa. (Hematoxylin and Eosin (H&E) x100) **d)** Fat necrosis and rare macrophage are present (H&E x200)

Table 1. Demographic and clinical findings of cases in lower extremity and iliac region

Case	Age	Gender	Localization	Size
1	62	Female	Right thigh	17x13x9
2	50	Male	Right hip	23x2x3
3	72	Female	Right hip	10x7x5
4	65	Female	Left hip	15x3x2
5	65	Male	Right hip	18x12x6
6	28	Female	Left thigh	14x15x8
7	41	Female	Left thigh	12x12x6
8	68	Male	Left iliac	11x9x2.5
9	53	Male	Left thigh	12x9x8
10	87	Female	Left thigh	24x13x8
11	66	Male	Right thigh	16x11x5
12	58	Female	Right thigh	17x11x6
13	78	Male	Left thigh	13x7x5
14	78	Female	Right thigh	21x24x7
15	70	Female	Right thigh	15x11x6
16	51	Female	Left hip	17x16x6
17	52	Male	Left thigh	13x6x5
18	46	Female	Right thigh	10x5x3
19	55	Female	Right thigh	15x8x7
20	57	Female	Left thigh	20x9.5x6
21	54	Female	Left thigh	13x10x6
22	68	Male	Left thigh	13x8x4

Table 2. Demographic and clinical findings of cases in upper extremity and back

Case	Age	Gender	Localization	Size
1	44	Male	Right shoulder	10x3x3
2	49	Male	Left arm	10x2x4
3	55	Female	Right shoulder	15x14x5
4	40	Female	Left arm	10x7x2.5
5	43	Female	Right shoulder	11x10x1
6	52	Male	Back	14x11x3
7	48	Male	Right shoulder	10x10x4
8	59	Male	Left shoulder	11x8x2
9	69	Male	Back	12x7x5
10	50	Male	Right arm	11x7x3
11	50	Female	Left arm	11x7x4.5
12	52	Male	Right shoulder	10.5x9x7
13	64	Male	Right arm	16x9x5.5
14	59	Female	Back	11x5.5x3
15	89	Female	Left arm	13x12x7
16	58	Female	Right arm	10x8x5
17	64	Female	Right arm	10x6x3.5
18	55	Female	Back	12x11x6
19	33	Female	Left arm	11.5x10.5x5
20	59	Male	Right shoulder	11.5x10.5x5

DISCUSSION

Lipoma is the most frequently detected soft tissue tumor of mesenchymal origin and is composed of mature adipocytes cells. Although the exact etiology of lipomas is unknown, genetic disorders like Gardner syndrome, chromosomal abnormalities, hypercholesterolemia, obesity, and trauma are among the suggested underlying causes (12). Hypercholesterolemia, obesity, and trauma may be especially associated with subcutaneous lipomas (13).

Lipomas usually manifest as thinly encapsulated, rounded mass varying in size (median 3 cm). However, a size larger than 10 cm is extremely uncommon (13,14). Giant lipomas have been described in various parts of the body, including the thigh, buttock, scapular region, and abdomen, usually as case reports or series. As sizes greater than 5 cm usually have been associated with an increased risk factor for malignancy, we opt to perform a preoperative biopsy in all our cases (15,16).

Göçer et al. (5) presented 17 cases who underwent total excision due to giant lipoma at the upper extremity. The mean follow-up was 42 months and there was one case with recurrence. He concluded that in large deep located lesions with a heterogeneous appearance on MRI, clinical information should be detailed to the pathologist for differential diagnosis.

Although some authors advocate using a 5 cm size as defining the giant cell lipoma, we prefer to use the cut-off value of 10 cm (1,5,17) as atypic lipomas/well-differentiated liposarcomas are usually more than 10 cm in diameter (18).

Aside from cosmetic problems, giant lipomas may cause neurovascular compression in upper and lower extremities as in our representative case. Gungor et al. (19) presented a giant thigh lipoma. The mass was measured as 10x14x23 cm, which abutted the femoral neurovascular bundle. After the biopsy confirmed lipoma, en-bloc resection was performed. At 24 months of follow-up, there was no recurrence. Pakanati et al. (6) presented a 25x20 cm giant lipoma located at the thigh which was excised. The final report was angiolipoma. The patient had no recurrence detected at the last follow-up.

Morales et al. (7) performed wide excision on a giant thigh lipoma in a 25-year-old female. As clinical and radiological findings were suggestive of lipoma, no biopsy was performed. He outlined that excision of giant lipomas should be performed with at least one cm of margin to decrease the risk of local recurrence.

Clesham et al. (20) excised a lipoma in a 65-year-old man which was causing median nerve compression. 2 weeks after excision, the neurological complaints resolved. Toft F. (21) in a recent study obtained satisfactory results 6 weeks after excision of a giant lipoma which was located at biceps brachii. He emphasized that management guidelines were inconsistent in these tumors. Giant lipomas however may cause a diagnostic challenge and be confused with atypical lipomatous tumors or other liposarcomas. A definitive diagnosis of giant cell lipoma can only be made by histopathological examination (22).

Although very rare, they may also transform into liposarcoma. Microscopically, lipomas present with well-defined masses consisting of mature adipocytes. There are also different subtypes like angiolipoma, fibrolipoma, spindle cell lipoma, pleomorphic lipoma, chondroid lipoma, and fibrohistiocytic lipoma other than typical lipomas (10).

Histopathologic findings that differentiate atypical lipomas/well-differentiated liposarcomas from lipomas are the location, size, and immunohistochemical features. Atypical lipomatous tumors tend to be in the deep tissues and retroperitoneum. Its diameter is usually greater than 10

cm, and its microscopic sections contain bands of hyalinized connective tissue, atypical nuclei, and lipoblasts. Immunohistochemically, p16, MDM2, and CDK4 are usually positive (23,24).

As another entity, lipomatosis is usually seen in childhood. It consists of diffuse lipomatous proliferation without a capsule. These help to differentiate lipomatosis from lipomas (25).

Only one patient had a spindle cell lipoma in our patient cohort with giant lipomas, and the remaining were classical subtypes. Spindle cell lipoma is a very rare benign lipomatous neoplasm composed of mature adipose tissue, ropey collagen, and bland spindle cells. They usually present as a subcutaneous mass and predilection to localize at the posterior neck, shoulder, and back region (26).

Radiologically, lipomas are usually less than 10 cm and usually have no or few thin (less than 2 cm) septa, with no or minimal contrast enhancement and no or minimal T2 signal foci detected with MRI examination, however giant lipomas may mimic liposarcomas (27).

Definitive treatment of giant cell lipoma is surgical excision after the diagnosis is usually confirmed with a biopsy as in our patient cohort as they may have overlapping features with other lesions like atypic lipomas both histopathologically and radiologically. Intralesional resection should be avoided whenever possible to prevent recurrence and the possibility of transforming to liposarcoma in the future.

CONCLUSION

Histopathological examination with preoperative biopsy is the key to diagnoses of giant cell lipomas, although MRI examinations are usually sensitive for detecting lipomas but less than 10 cm. Consultation with an experienced musculoskeletal pathologist should be carried out in case of any doubt for diagnosis. Immunohistochemical stains with CDK4 and MDM2 may further help to differentiate atypical lipomas which are usually larger than 10 cm from giant lipomas. Fluorescence in situ hybridization (FISH) analyses may increase the diagnostic accuracy in selected cases.

Ethics Committee Approval: The study was approved by the Clinical Research Ethics Committee of İstanbul Medeniyet University (16.06.2021, 319).

Conflict of Interest: None declared by the authors.

Financial Disclosure: None declared by the authors.

Acknowledgments: None declared by the authors.

Author Contributions: Idea/Concept: ATY, TZ, EO, AA, KÖ; Design: ATY, TZ, EO, AA, KÖ; Data Collection/Processing: ATY, TZ, EO, AA, KÖ; Analysis/Interpretation: ATY, TZ, EO, AA, KÖ; Literature Review: ATY, TZ, EO, AA, KÖ; Drafting/Writing: ATY, TZ, EO, AA, KÖ; Critical Review: ATY, TZ, EO, AA, KÖ.

REFERENCES

1. Johnson CN, Ha AS, Chen E, Davidson D. Lipomatous soft-tissue tumors. J Am Acad Orthop Surg. 2018;26(22):779-88.
2. Litchinko A, Cherbanyk F, Menth M, Egger B. Giant gluteal lipoma surgical management. BMJ Case Rep. 2019;12(8):e229842.
3. Ramirez-Montaño L, Lopez RP, Ortiz NS. Giant lipoma of the third finger of the hand. Springerplus. 2013;2(1):164.
4. Szewc M, Gawlik P, Żebrowski R, Sitarz R. Giant lipoma in the fronto-temporo-parietal region in an adult man: Case report and literature review. Clin Cosmet Investig Dermatol. 2020;13:1015-20.
5. Göçer H, Dabak N, Çıraklı A. Giant lipomas of the upper extremity. Acta Oncol Turc. 2016;49(3):192-6.
6. Pakanati R, Gogineni RC, Ede NB. Recurrent giant intermuscular lipoma of thigh. J NTR Univ Health Sci. 2019;8(3):219-21.
7. Morales Morales CA, González Urquijo M, Morales Flores LF, Sánchez Gallegos MN, Rodarte Shade M. Giant intramuscular thigh lipoma: A case report and review of literature. Int J Surg Case Rep. 2021;82:105885.
8. Aydoğdu E, Yıldırım S, Eker G, Aköz T. Giant lipoma of the back. Dermatol Surg. 2004;30(1):121-2.
9. Gondowardojo YRB, Argie D, Arifin MZ. Giant lower back lipoma in pediatric : a case report. Bali Med J. 2017;6(3):554-6.
10. Zenginkinet T, Okay E, Çelik A, Toksöz Yıldırım AN, Öztürk MB. Clinical results after surgical treatment of spindle cell lipomas. Duzce Med J. 2021;23(3):258-62.
11. Endo M, Lin PP. Surgical margins in the management of extremity soft tissue sarcoma. Chin Clin Oncol. 2018;7(4):37.
12. Niranjan A, Mutreja J. Review on lipoma and case studies. Eur J Mol Clin Med. 2020;7(6):1336-42.
13. Cribb GL, Cool WP, Ford DJ, Mangham DC. Giant lipomatous tumours of the hand and forearm. J Hand Surg Br. 2005;30(5):509-12.
14. Salam GA. Lipoma excision. Am Fam Physician. 2002;65(5):901-4.
15. Silistreli OK, Durmuş EU, Ulusal BG, Oztan Y, Görgü M. What should be the treatment modality in giant cutaneous lipomas? Review of the literature and report of 4 cases. Br J Plast Surg. 2005;58(3):394-8.
16. Celik C, Karakousis CP, Moore R, Holyoke ED. Liposarcomas: Prognosis and management. J Surg Oncol. 1980;14(3):245-9.
17. Abdulsalam T, Osuafor CN, Barrett M, Daly T. A giant lipoma. BMJ Case Rep. 2015;2015:bcr2015212030.
18. Fisher SB, Baxter KJ, Staley CA 3rd, Fisher KE, Monson DK, Murray DR, et al. The general surgeon's quandary: Atypical lipomatous tumor vs lipoma, who needs a surgical oncologist? J Am Coll Surg. 2013;217(5):881-8.
19. Gungor M, Sir E, Aksoy A, Agirbas S. Giant lipoma extending into two thigh canals: A case report. Acta Orthop Traumatol Turc. 2017;51(3):270-2.
20. Clesham K, Galbraith JG, Ramasamy A, Karkuri A. Giant lipoma of the hand causing median nerve compression. BMJ Case Rep. 2017;2017:bcr2017220056.

21. Toft F. Surgical resection of a giant intramuscular lipoma of the biceps brachii: a case report and review of the literature. Arch Orthop Trauma Surg. 2022;142(3):373-9.
22. Lee YJ, Jeong YJ, Lee JH, Jun YJ, Kim YJ. Liposarcoma in the axilla developed from a longstanding lipoma. Arch Plast Surg. 2014;41(5):600-2.
23. Altun E, Yüksel S, Kaygusuz G, Yıldız HY. Diagnostic importance of clinicopathologic features and p16, CD34, MDM2 expression in differential diagnosis of adipocytic tumors. Acta Orthop Traumatol Turc. 2020;54(1):59-65.
24. Nagano S, Yokouchi M, Setoguchi T, Ishidou Y, Sasaki H, Shimada H, et al. Differentiation of lipoma and atypical lipomatous tumor by a scoring system: Implication of increased vascularity on pathogenesis of liposarcoma. BMC Musculoskelet Disord. 2015;16(1):36.
25. Sheybani EF, Eutsler EP, Navarro OM. Fat-containing soft-tissue masses in children. Pediatr Radiol. 2016;46(13):1760-73.
26. Bancroft LW, Kransdorf MJ, Peterson JJ, Sundaram M, Murphey MD, O'Connor MI. Imaging characteristics of spindle cell lipoma. AJR Am J Roentgenol. 2003;181(5):1251-4.
27. Knebel C, Neumann J, Schwaiger BJ, Karampinos DC, Pfeiffer D, Specht K, et al. Differentiating atypical lipomatous tumors from lipomas with magnetic resonance imaging: A comparison with MDM2 gene amplification status. BMC Cancer. 2019;19(1):309.