



An Eclectic Compilation of Techniques and Procedures Used in Lipoma Surgery, Along with Results

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ABSTRACT

Adipose tumors called lipomas are commonly located in the subcutaneous tissues of the back, shoulders, neck, and head. These slowly developing, almost always benign tumors typically appear as round, nonpainful lumps that are movable and have a distinctively soft, doughy texture. Lipomas are most common in people aged 40 to 60, though they can occur at any age. Rarely, conditions including inherited multiple lipomatosis, adiposis dolorosa, Gardner's syndrome and Madelung's illness can be connected to lipomas. A prospective observational analysis was conducted to study the techniques and procedures used in lipoma surgery at Government Cuddalore Medical College and Hospital, a 1250-bedded multi-specialty tertiary care teaching hospital located in Chidambaram. A total of 22 cases were collected. Using the descriptive statistical analysis method, the gathered data was examined. About 45% of the patients in 22 cases were men, with the remaining 55% being women. Lipomas are most common in patients aged 41 to 50, comprising 53% of cases.

Keywords: Lipoma, tumors, techniques, surgery, procedures

INTRODUCTION

Adipose tissue under the skin makes up lipomas, which are benign tumors. Although they usually don't cause any symptoms, direct pressure can make them uncomfortable. Removal is usually carried out for cosmetic or therapeutic reasons. The uncommon form of liposarcoma requires rigorous surgical excision and careful recurrence monitoring. Usually, lipomas are excised; however, this procedure carries the risk of bleeding, infection, seroma, scarring, and recurrence. It is unknown what the precise etiology and pathophysiology of lipomatosis are. The review that follows concentrates on the many removal techniques, such as excisional surgery, minimum access surgery, liposuction, and laser removal, in addition to the current techniques for lipoma excision. [1]

Anatomical pathology

According to histology, lipomas are homogenous, well-circumscribed, soft, yellow to orange lobulated masses encased in a thin coating of fibrous protein. These benign tumors, which typically weigh only a few grams and are dispersed throughout the body in sizes ranging from 1 to >10 cm, are anticipated to impact the trunk and upper extremities. However, adipocytes can also occasionally be detected in deeper body areas where they are often prevalent, such as in cases of intramuscular and intermuscular lipoma, periosteal and periosteal lipoma, synovial lipomatosis, and intracranial lipoma.

Clinical pathology

Lipomas arise from mesenchymal preadipocytes rather than mature adipocytes, despite the fact that these frequently benign soft tissue lesions are rarely differentiated from normal adipose tissue. A variety of other tissues derived from mesenchyma can be found in related benign variants of lipomas, such as angioliipoma, which is made up of large, narrow vascular clefts that contain mature adipocytes; fibrolipoma, which contains a lot of fibrous tissue; chondroid lipoma, which contains cartilaginous elements among adipocytes; ossifying lipomas, which contain mature metaplastic bone; myoliipomas, which include adipocytes mixed with hematopoietic tissue; myxoliipomas, which contain a lot of mucoid mesenchymal tissues; and lipoblastoma, a rapidly growing tumor made of embryonal white fat with varying degrees of myxoid changes. Spindle cell lipoma, so named because of the spindle cells it contains, predominantly occurs in infants.[2]



Physiology of adipose tissue

Subcutaneous fat in mammals controls body temperature and offers defense. It is arranged as lobules with fibrous septae between them. Triglycerides make up the majority of the fat cells known as lipocytes, which are gathered into lobules. Collagen, blood arteries, nerves, and lymphatics are all found in fibrous septae, which join the dermis to the underlying fascia. The volume of lipocytes increases with an individual's weight. The quantity of mesenchymal stem cells that are transformed into fat cells rises with additional weight gain; while diet and exercise reduce the size of fat cells, they do not reduce their quantity. These new fat cells are called as "**resistant fat**". Adipose tissue that is normally functioning may expand abnormally, leading to lipomatous tumors.

Classification of soft tissue tumors

According to the WHO Committee on Soft Tissue Tumor Classification, there are nine recognized types of benign fatty tumors, including angiolioma, myxolioma, chondroid lipoma, spindle-cell and pleomorphic lipomas, lipoblastoma, lipoblastomatosis, lipomatosis, nerve-associated lipomatosis, and hibernoma. Treatment and presentation can differ for each of these distinct lipomatous tumor types. Mature white adipocytes with homogeneous nuclei that resemble normal white fat make up the majority of lipomatous tumors.

Epidemiology and clinical presentation

Adipose tissue lipomas are benign tumors made up of soft, lobulated lumps that are occasionally encased in a thin, fibrous capsule and held together by connective tissue. Lipomas are the most common soft tissue tumor, accounting for 1% of the population usually happens between 40 and 60 years of age. Even though lipomas can develop in almost any organ, most of them are subcutaneous and tend to develop on the neck and trunk. They only sometimes affect the deep muscle plane or fascia. Their texture ranges from soft to firm, and they don't change color over time. They might also be palpably elevated. The "slippage sign" is a small lateral movement that occurs when the mass's edges are lightly pushed. While lipomas generally do not cause symptoms, they should be observed for any noticeable changes. A size greater than 5 cm, pain or discomfort, rapid growth, diagnosis clarification, and cosmesis are all reasons to get it removed. The cause of lipomas is yet unknown. According to one hypothesis, trauma induces fat to herniate, which results in the development of pseudo-lipomas. According to an alternative theory, trauma causes cytokine release, which in turn causes pre-adipocyte differentiation. Trauma is not clearly linked to lipoma development. Chromosomal rearrangements involving chromosome 12, especially anomalies in the HMGA2-LLP fusion gene, are commonly linked to solitary lipomas. They can also occur in conditions like Madelung disease, adiposis dolorosa, Gardner's syndrome, and Cowden syndrome.[3]

Techniques used in lipoma surgery

A number of techniques are frequently used in hospital settings for lipoma surgery. Below are the most common methods:

Excisional surgery

Using this technique, an incision is made over the lipoma, the fatty tumor and some surrounding tissue are removed, and the incision is sutured shut. Larger lipomas or those that are deeper within the tissue are frequently better treated with excisional surgery.

Liposuction

Through a tiny skin incision, a thin tube (cannula) is inserted during the minimally invasive liposuction technique. The fatty tissue around the lipoma is suctioned out using a cannula. Liposuction is a better option than excisional surgery for tiny, superficial lipomas because it can leave fewer scars and promote a quicker recovery.

Endoscopic surgery

Using this method, a tiny incision is made close to the lipoma to insert an endoscope, a tiny, flexible tube equipped with a camera and light. After that, the surgeon uses specialized equipment to dissect and remove the lipoma tissue. The benefits of endoscopic surgery include less stress to the surrounding tissues and less scarring.

Minimal access surgery (MAS)

MAS comprises various minimally invasive surgical techniques, including endoscopic surgery and laparoscopic surgery. In the context of lipoma removal, MAS involves developing tiny incisions through which specialist devices and cameras are installed to



view and remove the lipoma. MAS has advantages, compared to standard open surgery, such as decreased postoperative pain, shorter hospital stays, and faster recovery surgery. These techniques would probably be used in a large medical facility setting with 1250 beds by a multidisciplinary team of surgeons, anesthesiologists, nurses, and support personnel to undertake lipoma procedures. The approach selected is determined by various criteria, including the size, location, and features of the lipoma, in addition to the general health of the patient and preferences.

Preparation of excision

Surgical excision is a popular method of treating lipomas. Using a marker to sketch the lipoma's outline and the intended skin excision on the skin's surface prior to surgery is frequently beneficial. The tumor's contour frequently aids in defining its edges, which may become obscure following anesthesia delivery. Redundancy at closure can be reduced by excising a portion of the skin. After that, the skin is cleansed using either chlorhexidine (Beta sept) or povidone iodine (Betadine) solution, being careful not to remove any skin markings. Sterile towels are used to drape the space. Local anesthesia is typically delivered using a field block technique with either 1% or 2% lidocaine mixed with epinephrine. When the anesthetic enters the subcutaneous area surrounding the surgical field, a field block is created.

Enucleation

Small lipomas can be removed via enucleation. An incision of 3 to 4 mm is made across the lipoma. To remove the lipoma from the surrounding tissue, a curette is inserted into the wound. The curette is used to enucleate the tumor through the incision after it has been released. To prevent hematoma formation, a pressure dressing is used instead of sutures, which are generally not required.

Excision

The easiest way to remove larger lipomas is to make incisions in the skin that covers the lipoma. Incisions are made in a fusiform shape, following the natural tension lines of the skin, and are smaller than the tumor itself. An Allis clamp, or hemostat, is used to apply traction by gripping the central area of skin that needs removal. The tumor is gently detached from the subcutaneous fat, with careful attention to avoid any underlying blood vessels or nerves. Tissue around the lipoma is cut under direct vision with a No. 15 scalpel or scissors. After detaching part of the lipoma, the remaining portion is removed by securing the tumor with hemostats or clamps to provide traction. Once freed, the lipoma is fully removed. To guarantee total tumor removal, the surrounding tissue in the hole can be palpated. [1]

Lipoma Treatment Costs in India.

Lipoma surgery type	Minimum price	Average price
Steroid injections	Rs. 3,000	Rs. 6,500
Lipoma excision	Rs. 40,000	Rs. 84,000
Liposuction	Rs. 25,000	Rs. 47,500
Punch hole excision	Rs. 30,000	Rs. 42,500

TAMIL NADU GOVERNMENT SCHEME:

(CM0726-I-B: Soft Tissue- Excision /Amputation/ Resection - Without Reconstruction)

Score	Grade	Amount
Above 80	A1	10000
71-80	A2	9000
61-70	A3	8100
51-60	A4	7290
41-50	A5	6561
Up to 40	A6	5905
Above 40	S1	10000

Objectives

- In all patients admitted for Lipoma surgery



- Study about the techniques and procedures done in lipoma surgery and compare with each other.

Materials and methods

Study setting

This study was carried out at Government Cuddalore Medical College and Hospital, a tertiary care teaching institution with 1,250 beds, situated in Chidambaram.

Study design

A Prospective observational study.

Study tools

Google form.

Study population

The study method includes selection of participants based on inclusion and exclusion criteria.

Inclusion criteria:

- Patients include adults
- Patients who undergo Lipoma surgery
- Resected tumors confirmed lipoma diagnosis

Exclusion criteria:

- Outpatients

Sample size

22 population.

Data analysis

The data gathered were recorded using Microsoft Excel and analysed using relevant statistical tool to provide significant results.

Research materials, records and privacy

Investigational records from this study were maintained in a confidential manner. The results were reported in the thesis. A copy of the thesis will be stored in the Department of Pharmacy library at Annamalai University.

Confidentiality

All efforts were made to maintain the confidentiality of the study records. Information collected during the study was identified by a unique study number to the medical record number.



Observation and findings

Table 1: Age Distribution of Lipoma Surgeries

AGE [YEARS]	NO. OF PATIENTS	PERCENTAGE
31-40	4	21%
41-50	10	53%
51-60	4	21%
Above 60	1	5%

From **Table 1:** Patients with age above 30 years were having Lipoma disease around 21% of total cases taken ,41-50 with 53%, 51-60 with 21% and above 60 are 18%.

Table 2: Gender wise distribution of lipoma

GENDER	NO. OF PATIENTS	PERCENTAGE
MALE	10	45%
FEMALE	12	55%

From **Table 2:** Out of 22 cases taken 10 were male with 45% and 12 were female with 55%, which depicts that female are more prone to lipoma.

Table 3: Site of presentation

SITE OF PRESENTATION	NO. OF PATIENTS	PERCENTAGE
Upper arm	11	52%
Back region	6	29%
Gluteal and Axilla	3	14%
Lumbar region	1	5%

From **Table 3,** Out of 22 patients, 11(52%) had lipoma at upper arm ,6(29%) at their back region, 3(14%) had at their gluteal axilla, 1(5%) for lumbar region.

Table 4: Antibiotics after surgery

ANTIBIOTICS	NO. OF PATIENTS	PERCENTAGE
Cefotaxime	14	64%
Cefotaxime + Metronidazole	4	18%
No Antibiotics	4	18%

ANTIBIOTICS AFTER SURGERY

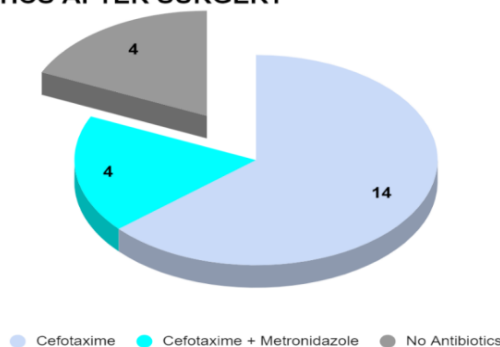


Figure-1



Table:4 shows about the antibiotic's prescription in surgery ward, in that way 14(64%) received only Cefotaxime, 4(18%) received both Cefotaxime + Metronidazole, the remaining 4(18%) received no antibiotics [Ref. Fig:1 for chart view]

Limitation

The prospective observational study has the following limitations:

1. Only excision biopsy is done no any other techniques had been followed.
2. Study carried out at a single centre.

Discussion

Demographic details:

Patients with age above 30 years were having Lipoma disease around 21% of total cases taken, 41-50 with 53%, 51-60 with 21% and above 60 are 18%, that show that the people above 40 years of age are more affected. Out of 22 cases taken, 10 were male with 45% and 12 were female with 55%, which depicts that female are more prone to lipoma.

Site of presentation:

Out of 22 patients, 11(52%) had lipoma at upper arm ,6(29%) at their back region, 3(14%) had at their gluteal axilla, 1(5%) for lumbar region which shows that there are more incidences of lipoma in the upper arm than in any other site of presentation.

Antibiotics prescribing pattern:

Here by the results states that, 14(64%) received only Cefotaxime, 4(18%) received both Cefotaxime + Metronidazole, the remaining 4(18%) received no antibiotics.

Conclusion

To sum up, deep-seated lipomas must be differentiated from other tumors due to their depth, even though they are less frequent than superficial lipomas. Thus, to avoid recurrence or functional impairments, a thorough preoperative diagnosis and measurement of the lesion's depth are crucial. Radiologic evaluations aid in the identification of deep-seated lipomas prior to treatment. The differential diagnosis of lipoma subtypes based on radiologic characteristics was only partially supported by the available data. Although imaging technology has advanced, biopsy-based diagnosis confirmation is still essential. Despite being a good technique that can be replaced by many of the ways stated in the introduction, excision biopsy was the method that our hospital's medical practitioners used the most. It can lessen post-operative discomfort and trauma, which speeds up recovery.

REFERENCES

- 1] Salam GA. Lipoma excision. Am Fam Physician. 2002 Mar 1;65(5):901-4. PMID: 11898962.
- 2] Boyer, Matthew, et al. "A review of techniques and procedures for lipoma treatment." Clin Dermatol 3.4 (2015): 105-112.
- 3] Tabatabaei, S. a. D. (2023). Lipoma; a common neoplasm. Research Square (Research Square). <https://doi.org/10.21203/rs.3.rs-2781683/v1>
- 4] Prajapati, D. K., Mahajan, S., & Prajapati, J. M. (2017). Lipoma, the universal tumor: in a rare location. International Surgery Journal, 4(10), 3542–3545. <https://doi.org/10.18203/2349-2902.isj20174535>
- 5] Nwashilli, Nnamdi. (2016). Lipoma of the Breast: an Uncommon Occurrence. Nigerian Journal of Surgical Sciences. 26. 12-14.
- 6] Kim, K., Kwon, S., Sim, W., & Lew, B. (2021). The Study of Relationship between Anatomical Sites and Depth of the Lipoma. Annals of Dermatology, 33(6), 562. <https://doi.org/10.5021/ad.2021.33.6.562>
- 7] Sarla, G. S. (2019). Deri altı lipomların epidemiyolojisi. Online Türk Sağlık Bilimleri Dergisi, 4(3), 350–359. <https://doi.org/10.26453/otjhs.470122>
- 8] Żyluk, A. (2021). Clinical Presentation and Outcomes of Surgery for Upper Extremity Lipomas. Ortopedia Traumatologia Rehabilitacja, 23(6), 393-400. <https://doi.org/10.5604/01.3001.0015.6353>



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