



Case Series

Excision of large lipomas using tumescent anaesthesia- A case series of seven patients in a tertiary center

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Abstract

Lipomas are the most common benign soft tissue tumors. Giant lipomas are generally excised under general anaesthesia because more local anaesthesia than is safe to inject may be required for complete excision. Tumescent anaesthesia is the evolving local anaesthesia technique used in procedures like liposuction, hair grafting, face lift, breast surgery, and skin resurfacing, now recently used in the excision of large lipomas. It involves infiltrating a large volume of a tumescent solution around the tumor. The solution is prepared by mixing Ringer Lactate (200 ml), Inj. Adrenaline (1 mg), Inj. Sodium Bicarbonate (5 ml), Inj. Lignocaine 0.2% (20 ml), Inj. Ropivacaine 0.75% (20 ml), and Inj. Hyaluronidase (1500 IU). We describe seven cases of large lipomas excised in minor operation theater without adverse complications.

Keywords: Giant lipoma, Tumescent anaesthesia, Lignocaine toxicity.

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1. Introduction

Lipomas are the most common benign soft tissue tumors, typically painless and slow-growing.¹ Excision is considered for cosmetic reasons, discomfort, or functional limitation. Many large lipomas that exceed 10 cm are removed under general anaesthesia, as it is unsafe to administer a large volume of local anaesthetic drug due to its toxic effects.

Tumescent anaesthesia (TA) is the subcutaneous infiltration of a large volume of a very dilute local anaesthetic with epinephrine and sodium bicarbonate. Tumescent lignocaine is absorbed from the subcutaneous tissue very slowly, resulting in delayed peak levels and providing extended postoperative analgesia. This effect is similar to depot injection. This technique provides profound anaesthesia, hemostasis, and tissue hydrodissection, facilitating a smooth surgical dissection. It is commonly used for liposuction, but it can be used in other surgeries, including

vascular surgery, breast surgery, plastic surgery, and ENT procedures.²

We describe seven cases of successful total excision of large lipomas using tumescent local anaesthesia in a minor operation theater. We included patients with large lipoma with age more than 15 years and ASA grading I and II. We excluded ASA grading III and IV and masses involving deeper tissues. All patients underwent a detailed physical examination and a preoperative ultrasound and cardiac evaluation. MRI/CT scan is planned if uncertain about the depth of the lipoma and to rule out malignancy.

Intraoperatively, heart rate, oxygen saturation, respiratory rate, and non-invasive blood pressures are monitored. We routinely do an intradermal test for lignocaine before surgery. Signs of lignocaine toxicity such as

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circumoral numbness, tongue paresthesia, dizziness, seizures, and arrhythmia are monitored during the procedure.

2. Technique

The solution was prepared by adding Inj. Adrenaline (1 mg), Inj. Sodium Bicarbonate (5 ml), Inj. Lignocaine 0.2% (20 ml), Inj. Ropivacaine 0.75% (20 ml), and Inj. Hyaluronidase (1500 IU) to a 200 ml bag of Ringer's Lactate, resulting in a total volume of ~245 mL. Approximately 250 mL of this mixture was injected around the base of the lipoma until the area became firm and blanched, indicating adequate anaesthesia and vasoconstriction. We used 23 gauge spinal needle for infiltrating the solutions around the tumor.

3. Case Series

3.1. Case 1

A 55-year-old male presented with a swelling on the nape of his neck, measuring 15cm×20 cm. The patient's past medical history was significant for chronic hypertension and obesity with a body mass index (BMI) of 32. Cardiac evaluation and blood investigation were normal. Ultrasound showed a hyperechoic mass, suggestive of a lipoma.

The surgical site was prepared under sterile conditions, and a tumescent solution was infiltrated around the lipoma. (Figure 1).



Figure 1: A large, well-defined lipoma on the nape of the neck in a 55-year-old male patient, prior to infiltration of tumescent anaesthesia

A 6 cm transverse incision was made over the most prominent part of the lipoma. Blunt and sharp dissection techniques were used to free the encapsulated lipoma from surrounding tissues. The lipoma was excised en bloc without damage to underlying structures.

The patient tolerated the procedure well and required observation in the recovery room for two hours. Postoperative pain was minimal with a VAS of 2/10 and

effectively managed with paracetamol. The suture site was healthy at follow-up and did not show recurrence.

3.2. Case 2

A 52-year-old male presented with a lipoma on his upper back. The mass had been noticeable for two years, but recently started to interfere with daily activities. The patient had a history of well-controlled hypertension and was on medications. On physical examination, the mass measured 12 cm x 10 cm. Ultrasound showed a superficial homogenous echogenic lesion in the upper back. Blood investigation was normal. Lipoma was excised under tumescent local anaesthesia. Postoperative VAS was 3/10. He did not show any recurrence on long-term follow-up.

3.3. Case 3

A 45-year-old female presented with a progressively enlarging mass on the medial aspect of her right thigh, associated with mild discomfort during physical activity. She had a history of well-controlled type 2 diabetes mellitus and no prior surgeries. On examination, the mass measured 15 cm x 12 cm, was soft, mobile, and non-tender, with no overlying skin changes. MRI confirmed the lesion as a well-circumscribed, homogenous fatty mass consistent with a lipoma, with no evidence of deep tissue invasion. Blood investigations showed controlled blood sugar levels and normal coagulation profiles. The lipoma was excised in a single piece with minimal blood loss.

Postoperatively, the VAS was 3/10 and patient experienced minimal discomfort, which was managed with acetaminophen, and observed for few hours. At her two-week follow-up, she demonstrated excellent wound healing with no signs of infection, and her discomfort during physical activity had resolved completely. The pathology report confirmed the diagnosis of a benign lipoma.

3.4. Case 4

A 60-year-old male presented with a large, painless mass on his left upper arm, which had been progressively increasing in size over two years with mild discomfort during arm movements. The past medical history includes obesity, hyperlipidemia, and a previous episode of shoulder bursitis. On examination, the mass measured approximately 14 cm x 10 cm, was firm, mobile, and non-tender, and appeared to be subcutaneous with no overlying skin abnormalities. Ultrasound imaging confirmed a lipoma, with no evidence of vascular or deep tissue involvement. Routine blood investigation, including liver function and coagulation profiles, was normal. The lipoma was excised in a single piece with minimal bleeding. The patient tolerated the procedure well. Postoperative VAS was 2/10. He did not develop recurrence.

3.5. Case 5

A 48-year-old male presented with a slow-growing, painless mass on the left side of his neck and expressed concern over the cosmetic appearance of the swelling. The patient had no notable medical history except for occasional smoking. On physical examination, the mass was approximately 10 cm x 8 cm, soft, mobile, and non-tender, located subcutaneously on the lateral aspect of the neck. Preoperative ultrasound confirmed a well-defined, encapsulated fatty lesion with no involvement of nearby vascular or neural structures. Routine blood investigation was unremarkable. A small 5 cm incision was strategically placed along a natural neck crease to minimize visible scarring. Dissection was carefully performed to free the lipoma from surrounding tissues, and it was excised in a single piece. Postoperatively, the patient was observed for three hours, and his VAS was 3/10. The wound healed well with a good cosmetic outcome.

3.6. Case 6

A 55-year-old female presented with a large, painless mass on the lower abdominal wall that had been gradually increasing in size over five years. The patient reported discomfort while sitting and performing daily activities due to the bulk of the mass. The past medical history included hypothyroidism and two previous cesarean deliveries. Physical examination revealed a 16 cm x 12 cm soft, mobile, subcutaneous mass over the anterior abdominal wall, located superficially to the rectus sheath absence of overlying skin changes or signs of inflammation. A CT scan was performed to confirm the lipoma's size and rule out involvement of deeper abdominal structures. Routine blood tests, including thyroid function tests, were within normal limits. The patient tolerated the procedure well with VAS of 4/10 and was discharged on the same day. She reported minimal pain and resumed light activities within two days. She did not complain of pain or recurrence of mass at follow-up.

3.7. Case 7

A 62-year-old female presented with a slow-growing mass on her left shoulder for four years. The mass caused discomfort and limited her arm movement, prompting her to seek medical attention. The patient had a history of coronary artery disease managed with medication. Physical examination revealed a soft, mobile, non-tender mass measuring approximately 20 cm x 15 cm, located superficially without overlying skin changes. Preoperative imaging, including ultrasound and MRI, confirmed a well-circumscribed lipoma without involvement of vascular, neural, or deep structures. The encapsulated lipoma was excised in a single piece without complications. She was discharged after a few hours of observation with a VAS of 3/10 and reported no complications during the recovery period. She did not develop recurrence at follow-up.



Figure 2: Intraoperative photograph showing the infiltration of tumescent anaesthesia at the base of the lipoma using a 23-gauge spinal needle. Note the blanching and swelling of the tissue, indicating effective vasoconstriction and hydrodissection

4. Discussion

Large lipomas are generally excised under general anaesthesia. Several less invasive techniques have been adopted to remove lipoma, including liposuction, endoscopic excision, laser lipolysis, and segmental extraction through a small incision. The complications of those piecemeal extractions include incomplete removal, insufficient hemostasis, and contusion of the incised skin margin.³

The use of tumescent local anaesthesia for excision of large lipomas offers several advantages, making it an effective and safe alternative to general anaesthesia in selective cases. Tumescent anaesthesia involves the infiltration of a solution containing a local anaesthetic (lignocaine), a vasoconstrictor (epinephrine), and a buffering agent (sodium bicarbonate). This technique provides profound anaesthesia, excellent hemostasis, and tissue hydrodissection, facilitating a smoother surgical dissection. The vasoconstrictive properties of epinephrine in the tumescent solution significantly reduce intraoperative blood loss. Sodium bicarbonate minimises the pain due to the acidic local anaesthetic solution. Lignocaine is absorbed very slowly from subcutaneous tissues, resulting in delayed peak blood levels, thereby providing extended postoperative analgesia. Hyaluronidase degrades hyaluronic acid, a primary component of the extracellular matrix, thereby increasing the permeability of connective tissues to the injected anaesthetic drug to diffuse more widely and quickly.⁴

It is most effective for superficial, encapsulated lipomas that are easily accessible. Deeper or more complex lipomas, particularly those involving vascular or neural structures, may necessitate a more extensive surgical approach under general anaesthesia.

MRI should be done preoperatively in all cases of large lipomas to define size, shape, and location, and also to rule out malignant masses or other cysts, as this affects the surgical approach.⁵

The five of our patients with large lipomas were not included in our case series for the following reason: patient who were too anxious for this surgery in an outpatient setting, who had intermuscular lesions involving the brachial plexus, or on anticoagulants for CAD. These patients underwent excision under general anaesthesia.

Although Cosulich et al reported piecemeal extraction through a minimal incision (25%-50% of lipoma diameter), we were able to perform complete excision using a similar size incision with TA.⁶ The incision size is affected by its anatomical location, but not by its diameter or depth.⁷

One of the primary challenges of this approach is the need for adequate training and expertise in administering tumescent anaesthesia. Improper infiltration techniques can lead to inadequate anaesthesia, incomplete vasoconstriction, or potential complications, such as tissue necrosis if epinephrine is used in excessive concentrations. The complication of Tumescent anaesthesia (TA) includes lignocaine toxicity, such as seizures and arrhythmias, hypertensive crisis due to epinephrine component. The other risks are pulmonary embolism, fluid overload, hypothermia and necrotizing fasciitis. This can be prevented by proper technique, monitoring the fluid status, warming the tumescent solution before the procedure, and following strict aseptic protocol respectively.

Schnabel et al reported no life-threatening complications directly related to tumescent anaesthesia in head and neck skin tumor surgery among geriatric patients.⁸ He reported hypertensive crisis in 6.7% of patients intraoperatively and cardiac arrhythmias in 0.8% postoperatively.

The maximal safe dose of lignocaine using the tumescent technique is 35mg/kg, which is 5 times more than the dose used for local anaesthesia.⁹

Patient should be monitored for lignocaine toxicity, such as perioral numbness, tinnitus, and CNS depression/excitation.

Furthermore, while tumescent anaesthesia is effective for superficial and encapsulated lipomas, it may not be suitable for deeply located lipomas or those with vascular or nerve involvement, which might require more extensive surgical approaches. It is contraindicated in patients with severe systemic disease, cardiovascular disease, severe

coagulation disorders, including thrombophilia, and during pregnancy.¹⁰

5. Conclusion

Tumescent local anaesthesia is a safe and effective technique for excising large, superficial lipomas in a minor operation theater setting, avoiding the need for general anaesthesia in select ASA I-II patients. Its benefits include reduced procedural risks, minimal recovery time, and cost-effectiveness. However, it requires appropriate patient selection, technical expertise, and thorough perioperative management to achieve optimal outcomes. This technique is suitable for outpatient surgical settings, particularly for those seeking minimally invasive procedures.

6. Patient Consent Statement

Consent obtained from all patients

7. Ethical Approval

Institutional Review Board approval number: [VMKVMC&H/IEC/25/015].

8. Source of Funding

None.

9. Conflict of Interest

None.

References

1. Kolb L, Yarrarapu SNS, Ameer MA, Rosario-Collazo JA. Lipoma. [Updated 2023 Aug 8]. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK507906/>.
2. Conroy PH, O'Rourke J. Tumescent anaesthesia. *Surgeon*. 2013;11(4):210–21. <https://doi.org/10.1016/j.surge.2012.12.009>.
3. Dixit VV, Wagh MS. Unfavourable outcomes of liposuction and their management. *Indian J Plast Surg*. 2013;46(2):377–92. <https://doi.org/10.4103/0970-0358.118617>.
4. Cornely ME, Hettenhausen C. The Addition of Hyaluronidase to Tumescent Local Anesthesia Supports Lymphological Liposculpture of Secondary Lymphedema. *Plast Reconstr Surg Glob Open*. 2021;9(12):e3995. <https://doi.org/10.1097/GOX.0000000000003995>.
5. Datir A, James SLJ, Ali K, Lee J, Ahmad M, Saifuddin A. MRI of soft-tissue masses: the relationship between lesion size, depth, and diagnosis. *Clin Radiol*. 2008;63(4):373–8; discussion 379–80. <https://doi.org/10.1016/j.crad.2007.08.016>.
6. Cosulich MT, Molenda MA, Mostow E, Bhatia AC, Brodell RT. Minimal Incision Extraction of Lipomas. *JAMA Dermatol*. 2014;150(12):1360–1. <https://doi.org/10.1001/jamadermatol.2014.3234>.
7. Kang DH, Lew BL, Kwon SH. Do the Clinical Characteristics of Lipomas Influence the Incision Length During Minimal Incision Extraction? *J Cutan Med Surg*. 2023;27(5):461–5. <https://doi.org/10.1177/12034754231188439>.
8. Schnabl SM, Garbe C, Breuninger H, Walter V, Aebischer V, Eckardt J, et al. Risk analysis of systemic side effects of tumescent local anaesthesia in the surgical treatment of geriatric and multimorbid patients with skin cancer. *J Eur Acad Dermatol Venereol*. 2023;37(1):65–74. <https://doi.org/10.1111/jdv.18588>.

9. Klein JA. Tumescent technique for regional anesthesia permits lidocaine doses of 35 mg/kg for liposuction. *J Dermatol Surg Oncol*. 1990;16(3):248-63. <https://doi.org/10.1111/j.1524-4725.1990.tb03961.x>.
10. Mysore V. Tumescent liposuction: standard guidelines of care. *Indian J Dermatol Venereol Leprol*. 2008;74 Suppl:S54–60.

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