International Journal of Research in Medical Sciences
Bhoir LN et al. Int J Res Med Sci. 2024 Aug;12(8):2842-2846
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20242209

Original Research Article

Suction assisted surgical extraction of subcutaneous lipoma

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Received: 19 January 2024
Revised: 18 July 2024
Accepted: 19 July 2024

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ABSTRACT

Background: Lipomas are the most common benign mesenchymal tumours in the body. Patients seek their removal due to disfigurement, discomfort or cancerphobia. Historically, open surgical removal was the mainstay of their treatment but striving for less scarring, liposuction is the only new FDA approved alternative.
Methods: 56 patients with subcutaneous lipoma of size 3 cm - 10 cm and fulfilling eligibility criteria were selected for this hospital based prospective cohort study after informed consent and Institutional Ethical Committee approval from June 2016 to July 2018. 3 mm irrigation cannula, 5 mm suction cannula, Suction holding tool and Luer lock syringe were used. Lipoma infiltrated with modified Klein solution. Lipoma suctioned out & through the same port, capsule in the cavity was pulled out employing long forceps. Results observed with regards to operative time, post-operative scars, post operative pain and recurrence**.**
Result: A total of 56 patients were enrolled, operated, and observed. Mean duration of lipoma removal surgery was 47.32 minutes. 67.85% patients had pain score 1 after 2 hours of surgery. 100% of patients had healthy scars. 80.4% patients had 0 Vancouver Scarscore after 6 month follow up and only 1 patient had recurrence in 5 months.
Conclusions: Our study showed good results in view of postoperative pain and quality of scar. Use of 5 mm cannula gave visually negligible scar with less than 2% recurrence rate. Even though the mean duration of surgery was 47 mins which is more compared to open excision, the good cosmetic result with minimal to no scar prevails over it.

Keywords: Irrigation cannula, Lipoma, Liposuction, Luer lock syringe, Modified klein solution, Universal pain score, Vancouver scar score

INTRODUCTION

Lipomas are well-defined encapsulated benign tumors arising from adipose tissue and comprise the common benign mesenchymal tumors in the human body.[1] Fat cells are main constituents, but depending on other tissue specimens incorporated, different pathomorphology can be seen in lipoma. Clinically they are soft, well circumscribed lesions, occurring anywhere in the body, hence called Universal Tumor but mainly subcutaneously on the trunk or extremities which slips below the palpating finger.[2] Historically, open excision was the mainstay of their treatment but at the cost of scarring and postoperative complications. So, based on accessibility of subcutaneous lipomas, new methods of less invasive treatments have evolved in recent decades to combat the same. They are as follows: NHET (Narrow Hole Extrusion Technique)- lid pot technique, endoscopic and ultrasonic removal, excision through a remote incision, laser extirpation and liposuction. Among them, Liposuction is the only FDA approved alternative to direct excision to remove lipoma which receives greatest credits. It is a cosmetic procedure that removes body fat surgically with the help of cannula under negative pressure(suction). While the suctioned fat cells are permanently gone, overall body fat generally returns to

the same level as before treatment after a few months. This is despite maintaining the previous diet and exercise regimen. The procedure may be performed under general, regional, or local anesthesia (Tumescent anesthesia). Tumescent anesthesia is injecting a very dilute solution of local anesthetic combined with epinephrine and sodium bicarbonate into tissue until it becomes firm and tense (tumescent).[3,4] Advantages of this agent are reduction in blood loss through both epinephrine induced vasoconstriction as well as hydrostatic compression from the tumescent effect and Sodium bicarbonate reduces pain associated with the injection of an acidic local anesthetic solution. Due to the unique pharmacokinetic profile of this technique, lidocaine doses of 35 mg/kg bodyweight have been shown to be safe for liposuction procedures.[5] So, we did a study where we performed lipomas extraction through liposuction under tumescent anesthesia on 56 patients and reported their outcomes to address concerns about recurrence, complications, cosmetic effects, and post operative pain with postoperative follow- up of at least 6 months. The objective is to remove subcutaneous lipoma of size 3-10 cm by suction assisted lipectomy, to assess postoperative pain with the help of universal pain screening scale and to assess the quality and cosmetic result of scarring.

METHODS

Sample design

A hospital based prospective cohort study.

Sample size

56 patients who presented to General Surgery Department over a duration of 2 years from June 2016 to July 2018, with subcutaneous lipoma of size 3 cm -10 cm was selected for the study after informed consent to observe the result of suction assisted extraction of subcutaneous lipoma with regards to operative time, post operative scars, post operative pain and recurrence.

Inclusion criteria

Patients with single or multiple subcutaneous lipomas of size 3 cm-10 cm. Age between 18 to 70 years (both male and female). Prior confirmation by local USG (wherever necessary)

Exclusion criteria

Known bleeding disorders or coagulation defects. Deranged platelet counts. Deranged prothrombin time (PT). Ongoing antiplatelet or anticoagulant medication. Chronic liver disease. History of trauma preceding the presentation of the lipoma. Hypersensitivity to local anesthetic. Lack of consent. Other than subcutaneous lipomas over face, neck, axilla and perineum.

Ethical approval

As per international standards, or University standards, written ethical approval has been collected and preserved by the author (s).

Material required

Beside basic surgical instruments, surgical extraction of lipoma required some special instruments, 3 mm irrigation cannula, 5 mm suction cannula, Suction holding tool and Luer lock syringe.

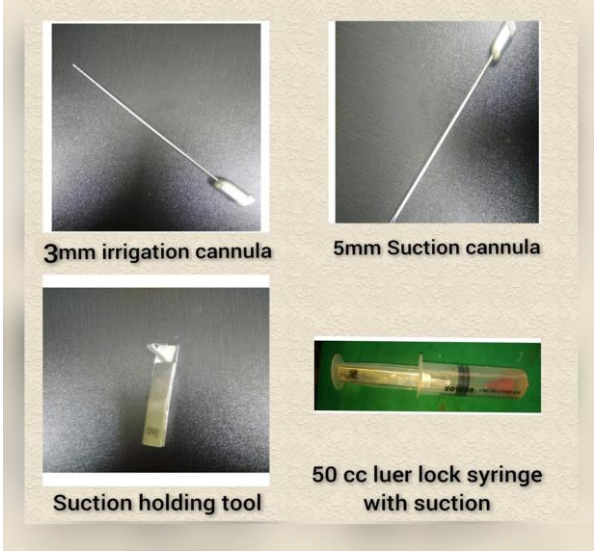

Figure 1: Instruments required for liposuction.

Figure 2: Whole suction unit for lipoma extraction.

Operative procedure

In this study, we chose only subcutaneous lipoma of size 3-10 cm. We followed classical recommendations for liposuction regarding infiltration, waiting period, suction, and respective end points. Around 10 mins before incision, broad spectrum antibiotic was given i.v as a single shot and xylocaine sensitivity test was done prior

to every procedure. Volume of lipoma calculated by measuring length, breadth and height/ thickness and equal amount of tumescent agent i.e. Modified klein solution was kept ready. We routinely prepared the solution by using the 'rule of 4' (4 ml of 1% lidocaine+4 ml sodium bicarbonate+0.4 ml adrenaline+40 ml 0.9% NaCl). This is also meant as a tumescent "suprawet" technique. Lipoma margins were marked prior infiltration and an entry port as incision was chosen, usually at the most cosmetically acceptable place about 2-5 cm away from the margin. Local anesthesia was given at the marked entry port site (about 1 ml of 1% lidocaine+0.01% adrenaline) 3 mm cannula introduced blindly in lipoma and irrigation with a tumescent agent was done.

A waiting period of 10 minutes was observed as part of standard procedure for analgesic action of tumescent agent to set. Liposuction was done with the to and fro method with the help of 50 cc Luer lock syringe in combination with 5 mm suction cannula. Negative pressure maintained in a syringe with the help of a suction holding tool. After finishing liposuction, through the same port, all the remaining hard tissue i.e., the capsule in the cavity was pulled out employing long forceps. Both (capsule and lipoma) tissue samples were sent for histopathological analysis: the solid tissue from the aspirate (after decantation and filtration on gauze) and the residual tissue that was taken away with the forceps at the end. The incision was approximated by a single non-absorbable suture and a compressive dressing was given. Total duration of surgery was calculated starting from time of local anesthesia given to 3 mm port site till suturing of incision.

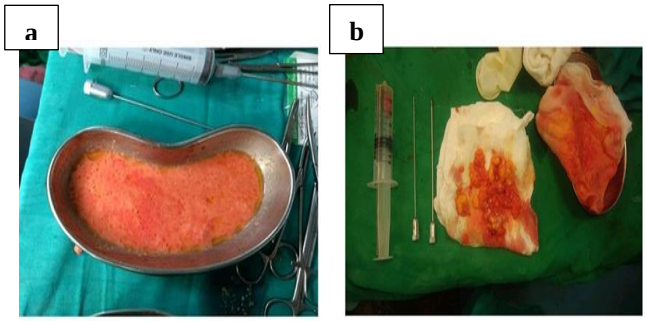

Figure 3: (a) Lipoma remnant after suction extraction of lipoma (b) Extracted fat of lipoma.

Wearing a compression bandage for 3 weeks was advised. Patient was observed for 2 hours for any soakage or haematoma formation and pain score was noted at the end of 2 hours and then discharged with oral antibiotics. On postoperative day 3, 10 and 30, the scar and early postoperative complications like haematoma formation, seroma formation, induration and dermal necrosis were evaluated. In the late follow-up period of up to 6 months and more, the quality of the scar and recurrence was assessed.

RESULTS

In our study, out of 56 patients, mean age was 39.36 years with standard deviation of 13.41 years with highest being 66 years and lowest 21 years. There were 61% males and 39% females. Majority of the patients, 22 (39.28%) belonged to the 21-30 years age group followed by 11 (19.64%) patients in the 41-50 years age group. The most common location in our study was on the shoulder and scapula comprising 18.7%, followed by the forearm (17%) and back (13.6%). Maximum number of patients had lipoma with a volume of 100-200 cm^3. Mean volume was 153 cm^3 with standard deviation of 81.89 cm^3 and highest volume being 400 cm^3 and lowest being 64 $cm.^3$ Mean duration of lipoma removal surgery was 47.32 minutes with standard deviation of 17.065 minutes and highest duration noted was 90 minutes and lowest 30 minute. In Table 1, high positive pearson correlation was observed between volume of lipoma and duration of surgery.

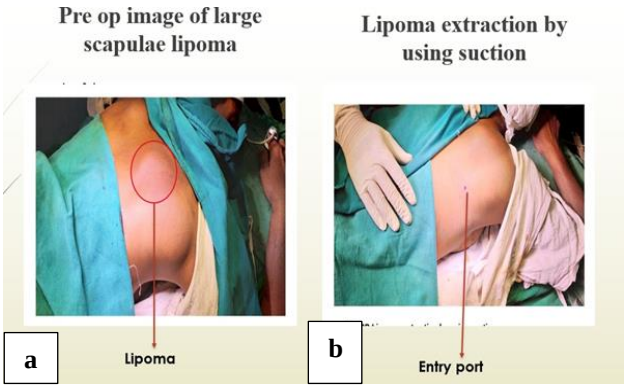

Figure 4: (a) Pre operative and (b) post-operative image of lipoma over scapular region after liposuction.

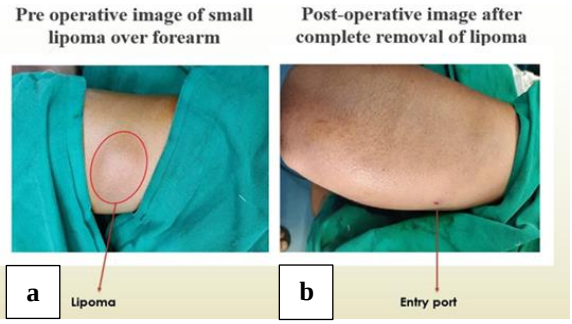

Figure 5: (a) Pre operative and (b) Post operative image of lipoma over forearm after liposuction.

Post operative pain was assessed after 2 hours of surgery i.e. after resolution of local anesthetic action, using Universal Pain scale that ranges from 0-10. Pain score 1 was the most common (mode) pain score in 38 patients (67%) and highest score of 2 was observed in 18 patients (33%). 49(87.5%) patients had no complication on 3rd

and 10th postoperative day, and 53 (94.6%) patients had no complication on 1 month follow-up (Table 2).

Table 1: Pearson correlation between volume of lipoma and duration of surgery.

		Volume	Duration
Volume	Pearson correlation	1	0.912**
	Sig. (2- tailed)		0.000
	N		56
Duration	Pearson correlation	0.912**	1
	Sig. (2- tailed)	0.000	
	N	56	56

** correlation is significant at the 0.01 level (2-tailed)

Table 2: Follow up after 3rd day, 10th day and 1 month.

	Frequency
3rd day follow up	
No complications	49
Hematoma	3
Localised swelling at surgical site	2
Seroma formation	2
10th day follow up	
No complications	49
Persistent swelling	2
Hematoma resolved	3
Seroma resolved	1
Seroma size decrease	1
1 month follow up	
No complications	53
Persistent swelling	2
Seroma resolved	1

All 56 patients had healthy scars with good quality scarring. 45 patients (80.6%) had Vancouver Scar score 0 and 11 patients (19.6%) had Vancouver scar score 1 after 6 months of follow up. Only 1 patient (1.7%) presented with recurrence of lipoma after 6 months.

DISCUSSIONS

Since the introduction of liposuction in 1975 by Fischer, followed by Illouz's "wet technique" in 1977, the indications for liposuction have expanded to include lipodystrophy, gynecomastia, and evacuation of lipomas.[6] Removal of lipomas by this technique is to decrease incision size and scarring was described in 1991.[7] Al-Basti and El-Khatib followed liposuction by capsular excision through the cannula incision, and Choi et al used tumescent liposuction to remove lipomas.[8] Post-operative scar was the main concern of the patients as patients had big scars after surgical excision of subcutaneous lipoma by open procedure. Lipomas on the exposed part of female patients leave behind large scars which are unacceptable. In our study, all 56 patients had healthy scars. All wounds healed with primary intention and suture was removed on 10th day except for 3 patients, in whom the suture was removed on 14th day without any wound complication in all patients. 80.6% patients had Vancouver Scar score 0 and 19.6% had Vancouver scar score 1 which accounts for excellent scar as per the scale.[9] Even after 2 hours of surgery i.e. after resolution of local anesthetic action, the most common pain score documented was just 1 and the highest score was just 2, both of which accounts for only mild pain on universal pain scale which ranges from 0-10. All the complications were minor (local) and no major (systemic) complications were seen requiring further treatment. Despite reports of favorable experiences, surgeons often forego liposuction out of concern that incomplete removal or recurrence might compromise outcomes or that cellular disruption might impede histopathological examination or mask malignant features.[10] But combined liposuction and excision, if needed, through the same incision facilitates complete removal of lipomas through small incision. These require greater direct excision of the fibrous components, initial liposuction aided debulking and facilitated removal through smaller incisions. Limitations are that fibrous lipomas and angiolipomas are less amenable to liposuction and also others having indistinct borders or transitions to non-lipomatous adipose tissue.[11,12,13] Recurrence risk in open lipectomy is around 3%. Studies published in the literature about suction assisted lipectomy have limited number of cases that can estimate risk of 2% or less.[14,15] Our study is also limited by sample size, which is insufficient to identify recurrence rates but only 1 patient (1.7%) had recurrence at 5th month post operatively.

CONCLUSION

Our study of 56 patients with subcutaneous lipoma of size 3-10 cm who underwent suction assisted surgical extraction, showed good results in view of postoperative pain and quality of scar. Extraction of subcutaneous lipoma with liposuction using cannula of size 5 mm, gave visually minimal or negligible scar and hence had very fantastic cosmetic result. The complications related to the procedure were minor and acceptable with less than 2% recurrence rate. Even though the mean duration of surgery was 47 mins which is more compared to open excision, the good cosmetic result with minimally no scar prevails over it.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bhoir LN, Sharma ND, Vishal, Pishe M. Suction assisted surgical extraction of subcutaneous lipoma. Int J Res Med Sci 2024;12:2842-6.