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Short incision for immediate breast reconstruction with fat-grafted latissimus dorsi flap after mastectomy: case series

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ABSTRACT

Introduction: The latissimus dorsi (LD) muscle flap, once widely used for delayed reconstructions with implant inclusion, has proven to be a feasible option for immediate, fully autologous breast reconstruction after mastectomy, thanks to the advent of fat grafting, which provides the muscle with the volume it naturally lacks. In cases of nipple-sparing mastectomies (SNSM), where there is no need for skin replacement in the breast, the flap can be obtained without removal of a dorsal skin island, a muscular flap rather than a myocutaneous flap, and thereby allowing for scar de-escalating in this type of reconstruction. **Methods:** Dissection and detachment of the LD muscle flap were performed entirely through the same incision used for the mastectomy, either in the inframammary fold or in a T-shaped breast incision. The entire procedure (mastectomy and reconstruction) was carried out with the patient in the supine position. Fat grafting was performed to the mastectomy skin flap and to the latissimus dorsi and pectoralis major muscles. **Results:** Between June 2022 and August 2025, immediate reconstruction with a lipoenriched LD muscle flap through a single and minimal incision following SNSM or skin reducing mastectomy was performed in 10 patients. The mean operative time was 307 minutes (5 h 7 min), including both mastectomy and reconstruction. The mean volume of grafted fat was 262 mL (range: 190–340 mL). Drain removal occurred at a mean of postoperative day 15 (range: 11–19 days). Six patients developed seroma at the donor site after drain removal. **Conclusions:** This study shows that small- to medium-volume breasts can be immediately and autologously reconstructed using a lipoenriched LD muscle flap without extensive donor-site scarring, with a low number of complications, reoperations and, in most cases, with only a single surgical procedure.

KEYWORDS: breast reconstruction; mastectomy; latissimus dorsi.

INTRODUCTION

When referring to immediate and total breast reconstruction, techniques using implants are the predominant methods worldwide, with the two-stage procedure using expanders followed by prostheses or one stage with prostheses being the most commonly performed[1,2]. Latissimus dorsi (LD) myocutaneous flaps are generally used for delayed reconstruction, especially in so-called hybrid reconstructions, where an expander or permanent implant is placed under the muscle to achieve the desired volume[3,4].

On the other hand, there is a worldwide trend toward the use of lipografted LD flaps in immediate and completely autologous breast reconstructions[5-11]. This has become possible thanks to the establishment of lipografting as a safe procedure from both an oncological and aesthetic point of view[12,13]. Lipografting of the LD has allowed the dispensing of implants in total breast reconstructions.

The extensive scar in the flap donor area is considered a possible disadvantage in autologous reconstructions, both in terms

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of aesthetic outcome and functional morbidity. In an attempt to minimize the damage caused by scarring and complete removal of the LD, a series of immediate breast reconstruction cases was performed using a partial LD flap lipografted through a single minimal incision in patients undergoing skin and nipple-areola complex sparing mastectomy (SNSM) without changing position during surgery.

METHODS

Type of study: This is an observational, prospective case series study.

Primary outcome: To demonstrate the feasibility and reproducibility of the technique.

Recruitment: Sampling was done for convenience. Consecutive patients from the Mastology outpatient clinic at Hospital Santa Casa de Misericórdia de Maceió, who met the inclusion criteria, were invited during the study period. All patients were operated on by a single surgeon trained in breast oncoplastic surgery.

Inclusion criteria: Females, aged between 18 and 65 years, with stage I–III invasive carcinoma, candidates for SNSM, whether or not they underwent neoadjuvant chemotherapy.

Exclusion criteria: Patients who did not consent to the technique and those with uncontrolled comorbidities.

The patients in the study did not require skin coverage at the mastectomy site; therefore, it was decided to use the muscle flap without a skin island, thus eliminating the classic and extensive scar on the back usually associated with the LD myocutaneous flap.

Study procedures: Surgery always began with mastectomy, followed by muscle flap dissection. The dissection and detachment of the LD were performed entirely through the same incision used for mastectomy, either via the inframammary fold or a T-shaped incision (Figures 1 and 2). The criterion for choosing the type of mastectomy incision was breast volume: nipple-sparing mastectomy with an incision in the inframammary fold was used in women with small breasts, whereas a T-shaped incision (skin-reducing mastectomy) was used in women with larger and/or ptotic breasts. Partial removal of the LD was undertaken, preserving the paravertebral fibers and the LD tendon of origin. Distal detachment of the muscle was performed approximately 4 cm above the iliac crest. The thoracodorsal neurovascular bundle was always identified before proximal sectioning of the muscle. The entire surgery (mastectomy+reconstruction) was conducted without repositioning, with patients maintained in a horizontal supine position or with a slight lateral tilt. Fat was collected from the abdominal wall and/or culottes and thighs and then centrifuged for 1.5 minutes at 3,000 rotations per minute. Lipografting was applied in the following planes: intramuscularly in the LD, intramuscularly in the pectoralis major muscle, and subcutaneously in the mastectomy skin flap, in various planes and directions. After complete detachment and lipografting, the LD flap was transferred to the mastectomy bed and fixed with separate absorbable sutures. A vacuum suction drain was inserted into the mastectomy bed and another into the flap donor bed. Quilting sutures in the flap donor bed were used in only one patient, the last one operated on in the series.

Statistics: The results of this study are exploratory and descriptive; therefore, no sample size was calculated. For descriptive analysis, continuous variables are presented as mean and standard deviation, while nominal or ordinal variables are presented by relative frequency.

This study was approved via Plataforma Brasil by the local Comitê de Ética em Pesquisa (CEP, Research Ethics Committee), and the Comissão Nacional de Ética em Pesquisa (CONEP, Brazilian National Commission for Research Ethics), under CAAE 69269723.0.0000.0155. Informed consent was obtained from all patients.



Figure 1. Mastectomy and reconstruction with incision through the inframammary fold.



Figure 2. Mastectomy and reconstruction with T-shaped incision.

RESULTS

Between June 2022 and August 2025, ten patients underwent immediate breast reconstruction with lipografted LD flap, without removal of the skin island in the flap donor area, after SNSM through a single incision in the inframammary fold or T-shaped incision for skin-reducing mastectomy. The three patients who underwent skin-reducing mastectomy also received contralateral mammoplasty. Demographic, operative, and complication data are summarized in Table 1.

Pre- and postoperative photographs were obtained from most patients (Figure 3).

Patients had a mean age of 50 years (range: 39–62 years).

The mean surgical time was 307 minutes (5 hours and 7 minutes), including mastectomy and reconstruction.

The mean volume of fat grafted was 262 mL (range: 190–340 mL).

Hospital stays averaged 24 hours.

The drain was removed, on average, on the 15th postoperative day (range: 11–19 days), whenever the output was less than 20 mL/24 hours.

Six patients developed seroma in the flap donor area after drain removal. One of the patients with seroma was treated only with tapping by the physical therapist, while the other five underwent simple punctures in the office, with an average of two punctures per patient. The patient who received quilting sutures in the flap donor site did not develop seroma after drain removal.

Partial necrosis of the nipple-areola complex (NAC) occurred in three patients. There were no cases of total NAC necrosis. One case of major complication was observed, with significant volumetric retraction of the reconstructed breast after radiotherapy in a patient with polymyositis.

Table 1. Patients and surgical characteristics.

Patient	Age	BMI	Type of mastectomy	Breast weight (g)	Lipografted volume (mL)	Surgical time	Seroma	Post-mastectomy radiotherapy	Follow-up time (month)
1	59	25	Nipple sparing	458	270	5h	Yes	Yes	37
2	62	28	Skin reduction	870	240	5h40min	Yes	No	36
3	56	26	Nipple sparing	442	240	5h30min	No	No	36
4	39	23	Nipple sparing	205	190	4h30min	No	Yes	35
5	46	30	Nipple sparing	355	250	4h20min	No	Yes	31
6	48	25	Nipple sparing	288	220	5h20min	Yes	No	29
7	46	29	Nipple sparing	325	270	5h	Yes	Yes	17
8	50	31	Skin reducing	580	340	5h10min	Yes	Yes	18
9	45	23	Skin reduction	557	280	5h	Yes	No	8
10	48	29	Nipple sparing	310	320	5h	No	No	2

BMI: body mass index.



Figure 3. 48-year-old patient who underwent skin-sparing mastectomy, left areola and nipple, and immediate reconstruction with latissimus dorsi muscle lipografted through a minimal incision in the inframammary fold. Preoperative and postoperative frontal view.

Only one patient underwent a new lipograft in the reconstructed breast to improve symmetry with the contralateral breast. Another patient underwent surgical reapproach on an outpatient basis to correct scarring in the donor area. There was no need for implant association in any patient to increase volume.

The peak volumetric reduction of the reconstructed breast occurred between 6–8 weeks after surgery.

No patient complained of deformity in the back. There were no cases of total loss of reconstruction and no cases of locoregional or distant recurrence during the three years of follow-up.

DISCUSSION

The LD myocutaneous flap is extremely versatile; however, for many years, it has been traditionally used in hybrid reconstructions (flap+prosthesis) due to its low volume, which is almost always insufficient to achieve the desired breast size. To overcome this volume deficiency, the flap is routinely augmented with the insertion of implants, yet this procedure is not without complications and may even accumulate the morbidity of both techniques[3].

Risks of infection, extrusion, rupture, capsular contracture, poor cosmetic results after radiotherapy, and a recently suggested connection with anaplastic large cell lymphoma are the main disadvantages of using implants[14-16]. For patients who do not want breast implants, reconstruction with autologous tissue is the only option. Piat et al. demonstrated that it is possible to replace the implant with a lipografted LD flap in women who have already undergone implant-based reconstruction and had unsatisfactory results[17]. In our service, the initial motivation for performing immediate autologous reconstructions with lipografted LD flaps was the difficulty in accessing prostheses for breast reconstructions for patients treated within the Brazilian Unified Health System.

In 2014, Santanelli described the technique of total autologous breast reconstruction with the LD myocutaneous flap, without the addition of implants. Lipografting was used because the LD muscle does not usually provide sufficient volume for total breast reconstruction[5]. Thus, the volume of fat grafted into the muscle replaced the volume provided by the prosthesis.

In recent years, lipografted LD myocutaneous flap has established itself as an excellent alternative for immediate or delayed breast reconstruction after mastectomy[5-11,16,17]. Piat et al. chose this technique as the first option for immediate breast reconstruction after mastectomy in their service in France, as it is an efficient method with excellent long-term results in this setting. No cases of unsatisfactory results were reported by patients or the medical team[17]. A high degree of patient satisfaction (92%) can be achieved with this technique[11]. The risk of complications with LD flaps is considered low. When compared to free abdominal flaps, a significantly lower risk of developing wound-related complications favoring the LD flap was foung[18]. However, an additional session of lipografting may be necessary in 11.3% to 44.2% of cases in order to improve symmetry with the contralateral breast[8,18]. In our sample, only one patient expressed the desire for secondary lipografting for symmetry.

A study of the UK population found that 69.5% of patients reconstructed with implants alone required surgical revision within eight years, compared to 49.3% of patients who underwent autologous reconstruction[19]. Previous evidence indicates that immediate post-mastectomy reconstruction with implants may fail, especially in patients undergoing radiotherapy[20]. Most studies found a significant need for unplanned interventions or corrective surgeries in irradiated breasts reconstructed with implants when compared to patients reconstructed with autologous tissue[21]. In our series, only two patients required secondary surgical intervention, one for additional lipografting with contralateral mammoplasty and the other for correction of scar retraction, the latter being an outpatient procedure performed under local anesthesia. In our series, five patients received adjuvant radiotherapy, and only one of them expressed a desire for secondary lipografting for symmetry. The patient with polymyositis who developed significant retraction of the reconstructed breast after radiotherapy did not express the desire for a new reconstruction attempt.

The increasing use of lipografting as a strategy to augment the flap has solved the problem of insufficient muscle volume; however, the extensive scar on the side of the chest and back remains bothersome from an aesthetic and functional standpoint for patients who undergo this technique. The LD flap with no scars at the donor site was described by Maitani et al. in 2021 and showed excellent results for patients with small breasts[22].

No studies were found in the literature that demonstrated exactly the technique presented in our research. Only Maitani et al. described a similar technique, but with extended removal of the LD muscle and the need to change the patient's position during surgery[22]. The authors conducted the mastectomy with the patient in a horizontal supine position and mobilized the muscle flap with the patient in a lateral decubitus position, which may have increased surgical time[22]. In the study presented here, the muscle was partially removed without the need for patient repositioning, as the entire surgery was undertaken in the supine position for both mastectomy and partial removal of the muscle, details that may have shortened the surgical time in our series.

Ahmed et al.[23] published a case series with 21 patients undergoing immediate reconstruction after mastectomy with LD flap assisted by video endoscopy through a small incision in the dorsal region, with good results. However, there was also a need to change the patients' position during surgery, and the scar on the back, although smaller, remained. In addition, the use of video



Figure 4. No scar on the back.

endoscopic equipment was necessary, which makes this procedure difficult to reproduce. In our study, the surgeries were performed using surgical equipment commonly used in conventional breast surgery.

The present study presents a technique with innovative features and the following advantages: no scar on the back (Figure 4), partial preservation of the LD, single decubitus during the procedure, low complication rate, and small number of reoperations. The high incidence of seroma can be considered a limitation of the technique; nevertheless, it is a complication that can be easily overcome on an outpatient basis. Another disadvantage is the volumetric reduction of the reconstructed breast after radiotherapy. Despite this asymmetry, most patients remained satisfied, with only one undergoing the new surgical approach for complementary lipografting in our series.

CONCLUSIONS

This study demonstrates that small and medium-sized breasts can be reconstructed immediately and autologously with lipografted LD flaps without extensive scarring in the donor area and, in most cases, with only one surgical procedure. Our technique is innovative, has low morbidity, and can be widely reproduced in breast oncoplasty services that do not have prostheses to perform immediate reconstruction or in patients who do not want breast reconstruction with implants.

AUTHORS' CONTRIBUTIONS

LMTPP: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. PCS: Project administration, Resources, Writing – review & editing. LNBLL: Data curation, Methodology, Writing – review & editing. ACR: Data curation, Methodology, Writing – review & editing. GMC: Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. CFACCML: Conceptualization, Data curation, Investigation, Methodology, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MNBCY: Project administration, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. PHJC: Conceptualization, Data curation, Investigation, Supervision, Visualization, Writing – original draft, Writing – review & editing.

REFERENCES

1. Dikmans REG, Negenborn VL, Bouman MB, Winters HAH, Twisk JWR, Ruhé PQ, et al. Two-stage implant-based breast reconstruction compared with immediate one-stage implant-based breast reconstruction augmented with an acellular dermal matrix: an open-label, phase 4, multicentre, randomised, controlled trial. Lancet Oncol. 2017;18(2):251-8. https://doi.org/10.1016/S1470-2045(16)30668-4
2. Bertozzi N, Pesce M, Santi P, Raposio E. One-stage immediate breast reconstruction: a concise review. Biomed Res Int. 2017;2017:6486859. https://doi.org/10.1155/2017/6486859
3. Tarantino I, Banic A, Fischer T. Evaluation of late results in breast reconstruction by latissimus dorsi flap and prosthesis implantation. Plast Reconstr Surg. 2006;117(5):1387-94. https://doi.org/10.1097/01.prs.0000207396.22527.68
4. Chiasson KF, Kumbla PA, Restrepo RD, Soto E, Cohn AB. Immediate latissimus dorsi and prosthetic reconstruction in the setting of postmastectomy radiation. An analysis of 376 breast reconstructions. Ann Plast Surg. 2020;84(6S):S364-S368. https://doi.org/10.1097/SAP.0000000000002279
5. di Pompeo FS, Laporta R, Sorotos M, Pagnoni M, Falesiedi F, Longo B. Latissimus dorsi flap for total autologous immediate breast reconstruction without implants. Plast Reconstr Surg. 2014;134(6):871e-879e. https://doi.org/10.1097/PRS.0000000000000859
6. Brondi RS, Oliveira VM, Bagnoli F, Mateus EF, Rinaldi JF. Autologous breast reconstruction with the latissimus dorsi muscle with immediate fat grafting: long-term results and patient satisfaction. Ann Plast Surg. 2019;82(2):152-7. https://doi.org/10.1097/SAP.0000000000001764
7. Piat JM, Tomazzoni G, Giovinazzo V, Dubost V, Maiato AP, Quoc CH. Lipofilled mini dorsi flap: an efficient less invasive concept for immediate breast reconstruction. Ann Plast Surg. 2020;85(4):369-75. https://doi.org/10.1097/SAP.0000000000002237

8. Taminato M, Tomita K, Nomori M, Maeda D, Seike S, Tashima H et al. Fat-augmented latissimus dorsi myocutaneous flap for total breast reconstruction: a report of 54 consecutive Asian cases. J Plast Reconstr Aesthet Surg. 2021;74(6):1213-22. https://doi.org/10.1016/j.bjps.2020.10.089
9. Johns N, Fairbairn N, Trail M, Ewing A, Yong L, Raine C, et al. Autologous breast reconstruction using the immediately lipofilled extended latissimus dorsi flap. J Plast Reconstri Aesthet Surg. 2018;71(2):201-8. https://doi.org/10.1016/j.bjps.2017.10.015
10. Piat JM, Giovinazzo V, Talha A, Dubost V, Maiato AP, Quoc CH. La reconstruction mammaire par le minidorsal lipofillé. Rev Kinésithér. 2020;20(227):16-20. https://doi.org/10.1016/j.kine.2020.08.006
11. Ahmed YS, El Maksoud WMA, Sultan MH, El-Bakoury EA. Latissimus Dorsi flap enhancement by lipofilling as an immediate breast reconstruction technique for skin-preserving mastectomy. Breast J. 2021;27(3):222-30. https://doi.org/10.1111/tbj.14116
12. De Decker M, De Schrijver L, Thiessen F, Tondu T, Van Goethem M, Tjalma WA. Breast cancer and fat grafting: efficacy, safety and complications–a systematic review. Eur J Obstet Gynecol Reprod Biol. 2016;207:100-8. https://doi.org/10.1016/j.ejogrb.2016.10.032
13. Couto-González I, Vila I, Brea-García B, Soldevila-Guilera S, Fernández-Marcos AA, Pardo M, et al. Response to invited discussion on: "Safety of large-volume immediate fat grafting for latissimus dorsi-only breast reconstruction: results and related complications in 95 consecutive cases". Aesthetic Plast Surg. 2022;46(Suppl 1):154-5. https://doi.org/10.1007/s00266-020-01964-z
14. Hodgson ELB, Malata CM. Implant-based breast reconstruction following mastectomy. Breast Dis. 2002;16:47-63. https://doi.org/10.3233/bd-2002-16109
15. Abdalla HM, Shalaan MA, Fouad FA, Elsayed A A. Immediate breast reconstruction with expander assisted latissimus dorsi flap after skin sparing mastectomy. J Egypt Natl Canc Inst. 2006;18(2):134-40. PMID: 17496938.
16. Kim B, Roth C, Chung KC, Young VL, van Busum K, Schnyer C, et al. Anaplastic large cell lymphoma and breast implants: a systematic review. Plast Reconstr Surg. 2011;127(6):2141-50. https://doi.org/10.1097/PRS.0b013e3182172418
17. Piat JM, Giovinazzo V, Talha A, Tomazzoni GD, Maiato AP, Budel LR, et al. Conversion of breast implants into natural breast reconstruction: evaluating lipofilled mini dorsi flap. Plast Reconstr Surg Glob Open. 2022;10(7):e4450. https://doi.org/10.1097/GOX.0000000000004450
18. Escandón JM, Escandón L, Ahmed A, Weiss A, Nazerali R, Ciudad P, et al. Breast reconstruction using the Latissimus Dorsi Flap and Immediate Fat Transfer (LIFT): a systematic review and meta-analysis. J Plast Reconstr Aesthet Surg. 2022;75(11):4106-116. https://doi.org/10.1016/j.bjps.2022.08.025
19. Johnson L, White P, Holcombe C, O'Donoghue J, Jeevan R, Browne J, et al. Impact of procedure type on revisional surgery and secondary reconstruction after immediate breast reconstruction in a population-based cohort. Br J Surg. 2023;110(6):666-75. https://doi.org/10.1093/bjs/znad050
20. Barreau-Pouhaer L, Lê MG, Rietjens M, Arriagada R, Contesso G, Martins R, et al. Risk factors for failure of immediate breast reconstruction with prosthesis after total mastectomy for breast cancer. Cancer. 1992;70(5):1145-51. https://doi.org/10.1002/1097-0142(19920901)70:5≤1145::aid-cncr2820700520≥3.0.co;2-3
21. Clemens MW, Kronowitz SJ. Current perspectives on radiation therapy in autologous and prosthetic breast reconstruction. Gland Surg. 2015;4(3):222-31. https://doi.org/10.3978/j.issn.2227-684X.2015.04.03
22. Maitani K, Tomita K, Taminato M, Kubo T. Scarless total breast reconstruction with a fat-augmented latissimus dorsi flap. Plast Reconstr Surg Glob Open. 2021;9(10):e3887. https://doi.org/10.1097/GOX.0000000000003887
23. Ahmed YS, El Maksoud WMA. Combined endoscopy-assisted muscle-sparing latissimus dorsi flap harvesting with lipofilling enhancement as a new volume replacement technique in breast reconstruction. Breast J. 2022;2022:7740439. https://doi.org/10.1155/2022/7740439

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