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Research Article

Immediate Breast Reconstruction with Latissimus Dorsi Musculo-cutaneous V-D Flap in Breast Conserving Surgery. A New Modified Technique

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Abstract

The objective of this study is to present a new modified technique for immediate breast reconstruction, in breast conserving surgery. We present a descriptive study of four patients with breast cancer treated with a modified radical mastectomy, with skin and nipple-areolar complex preservation and immediate breast reconstruction with latissimus dorsi musculo-cutaneos V-D flap.

Only one of the four patients presented in this descriptive study required adjuvant radiotherapy. One patient required partial de-epithelialization of the flap and in another patient the flap was not de-epithelialized at all. In three of the four patients, the mastectomy was performed through the same approach as the flap harvest. Only in one patient was necessary to use two different approaches for the mastectomy and breast reconstruction.

Keywords: Musculocutaneous Flap; Myocutaneous Flap; Latissimus Dorsi Flap; Mastectomy; Skin Sparing Mastectomy; Mammaplasty; Breast Conserving Surgery; Immediate Breast Reconstruction

Introduction

In 2018, 13,380 new cases of breast cancer were reported in Colombia. It is the first neoplasm in women, with an estimated incidence of 14.73% and an associated mortality of 8.89% [1]. It is the first cause of death associated to malignant neoplasms in women (12.9%, 20,995) in our country, with a rising tendency [2,3].

In Colombia, general population access to health services is not equal in every socioeconomic group. 6.3% of the population has difficulties acquiring these services [4]. The use of diagnostic tools and treatment options in women with breast cancer varies according to the affiliation to the Health Social Security General System (Sistema de Seguridad Social en Salud), income and education level [5]. There are also differences in patient's participation in prevention activities, such as screening mammography, being higher among patients with a higher socioeconomic status.

These situations predispose to late diagnosis in breast cancer in a lot of patients, forcing the physicians involved to give a fast and effective solution to this problem. Not all Plastic Surgery Departments in every city in Colombia have the availability of Microsurgery as a reconstructive tool. In most cases there are also troubles

with formalities from insurance companies to authorize implant-based reconstruction, that can even delay the appropriate oncological treatment. This is why the latissimus dorsi musculo-cutaneous pedicled flap continues to be a valid and good option for us in this vulnerable population of patients.

Since its original description by Tansini in 1906, until the popularization of the technique by Bostwick in 1978 for breast reconstruction [6], the latissimus dorsi has been a key element and a workhorse flap for plastic surgeons in different scenarios.

In mastectomy defects, up to 120% of volume, the latissimus dorsi flap has been only used as coverage, as described by Mendoza in 2011. In our department we have modified this technique adding three types of movement within the traditional V-Y advancement flap. The first step is the V-Y advancement of the flap to the mastectomy defect in the anterior thorax. The second step is a 180º clockwise rotation of the flap (cephalad rotation). The last step is an additional V-Y advancement flap designed within the middle third of the latissimus dorsi skin island to fill and project the lower pole of the reconstructed breast. At the end of all movements it resembles a laying "D" on the lateral view. Here we present a new modified technique for immediate breast reconstruction after breast conserving surgery without the need of breast implants.

(put complete diagram of the new technique, it can be image of previous work of flap vd referenced).

Materials and Methods

We present a descriptive study with a literature review of 4 breast cancer patients who underwent skin sparing mastectomy and immediate breast reconstruction.

Technique

Design of a traditional V-Y advancement flap in the lateral and posterior thorax, with one third of the flap in contact with the mastectomy defect and the other two thirds form the lateral thoracic wall, inferior to the margins of the former. The vertex of the V-Y design limits with the middle line of the posterior thorax, with an inferior tilt of 30º approximately.

If more tissue is needed, the V-Y design can be modified into an ellipse of skin, from the upper abdomen (inferior to the inframammary fold) were more tissue is available for the reconstruction. Once the flap has been harvested from the lateral and posterior thorax and freed from its muscular insertions completely, the flap is advanced to the mastectomy defect and rotated clockwise 180º. This type of movement improves the reach of the flap to the inner quadrants of the breast (inferior and superior). Depending on the mastectomy flap conditions (performed by the breast surgeon), the flap can be fully or partially de-epithelialized, depending on the probability of skin necrosis. If the mastectomy flaps present necrosis in the postoperative period, the surgeon can use the underlying skin of the LD flap to repair the affected part of the flap. If no suffering of the mastectomy flaps occurs, the patient is taken one week after the initial procedure to the operating room and the LD flap is completely de-epithelialized. It can be performed at the time of lymph node dissection in case of a positive sentinel lymph node or if surgical margins have to be broadened.

The portion of the flap that limits within both axillary lines has to be narrower to permit primary closure of the donor site, without tension. It is recommended to close the donor site with the arm abducted and elevated to avoid unnecessary tension afterwards.

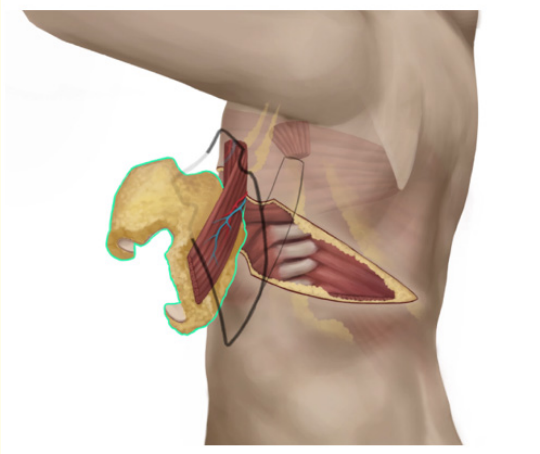

Figure 1: In lateral decubitus the flap is harvested until visualization of the thoracodorsal pedicle. The insertion site at the humerus must be freed to permit advancement and rotation. Most of the subcutaneous cellular tissue is dependent from the lateral thoracic wall.

Results

Case 1

A 48-year-old women with right breast cancer, stage II B. She received neo-adyuvant chemotherapy and afterwards underwent to a

modified radical mastectomy and immediate breast reconstruction with latissimus dorsi V-D flap, both through the same approach in the lateral thorax on June 2017. In this case the latissimus dorsi flap was completely de-epithelialized. The mastectomy flaps and nipple areolar did not present necrosis in the postoperative period. She did not require adjuvant radiotherapy.

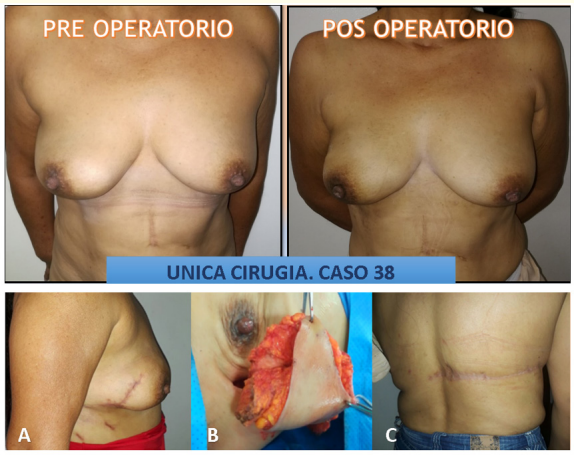

Figure 2: Pre-operative view (above left) and 1-year post -operative view (above right, below left and right). QUITAR IMAGEN B.

Case 2

40-year-old women, with infiltrating ductal carcinoma of the right breast, stage III A. She underwent a nipple-sparing mastectomy with immediate breast reconstruction on Abril 2017. The reconstruction was made with a latissimus dorsi V-D according to the defect in volume and in size. The flap was also completely de-epithelialized. At the second postoperative day the nipple-areolar complex presented necrosis. She required adjuvant radiotherapy and during the fellow up she presented radiodermatitis. One year after surgery the breast started descending to natural appearance.

(Try to leave the images separately, without background behind, without they being grouped).

Case 3

A 56-year-old female. Invasive lobular carcinoma of the right breast, stage IIA. Underwent a modified radical mastectomy with immediate breast reconstruction on June 2018. In this case we did not de-epithelialized the latissimus dorsi flap because of the appearance of the mastectomy flap after resection. During the second of follow-up we evidenced necrosis of the mastectomy flap. At one-week post-op she is taken back to the operating room for debridement of the compromised skin and reconstruction with the latissimus dorsi remaining skin according to the resulting defect after the procedure. The skin preserved in the flap served as a rescue maneuver for this complication in this particular scenario.

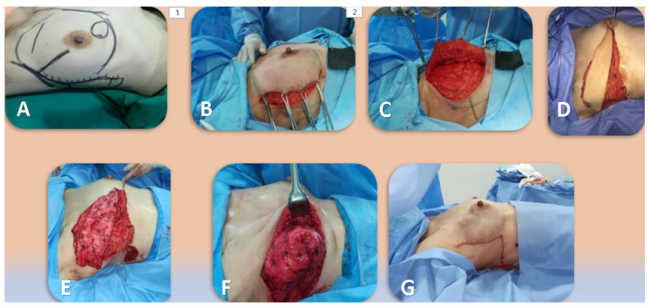

Figure 3: A. Flap markings. B. Approach to both mastectomy and flap harvest. C. Mastectomy flap thickness and dissection. D. Flap elevation and position in the lateral and anterior thorax. E. De-epithelialized flap. F. After the three movements of the flap before closure. G. Immediate postoperative view.

Figure 4: A. Preoperative view. B, C, D, E, F, ischemia and necrosis follow-up. G. Radiodermatitis after adjuvant therapy. H. 1-year postoperative view.

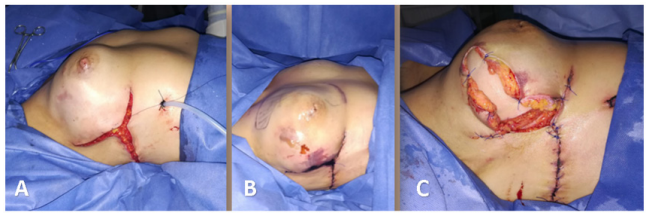

Figure 5: Approach to mastectomy and flap harvest. Skin design varied in this case, taken an ellipse of skin and tissue from the inframammary region, in the upper abdomen. B. Mastectomy skin state during the immediate post-op. C. One-week post-op after necrotic tissue debridement. The underlaying skin of the LD flap is seen through the defect.

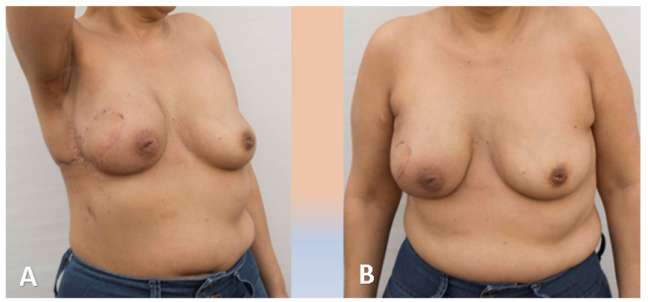

Figure 6: A, B. One-year postoperative view.

Case 4

42-year-old patient diagnosed with a ductal infiltrating carcinoma of the right breast, stage IIB. She underwent a nipple-sparing mastectomy on February 2019. Because of tumor location and volume needed for the reconstruction, two approaches were used in this patient. One in the upper and outer quadrant of the breast and the other in the lateral thorax as a continuation of the inframammary fold. As we suspected ischemia of the mastectomy flaps during surgery, the LD flap was not completely de-epithelialized. During the follow up we did not evidenced necrosis of the flaps and after one week she was taken back to the operating room for flap de-epithelialization. After one year a natural descent shape of the breast is seen.

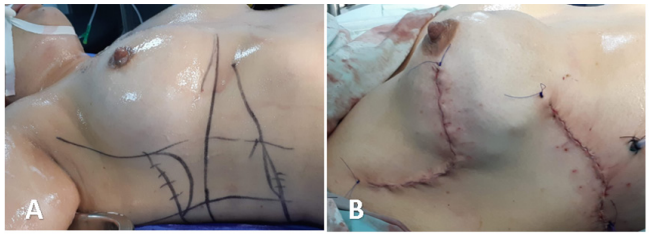

Figure 7: A. Flap design in the upper abdomen. B. Immediate postoperative view.

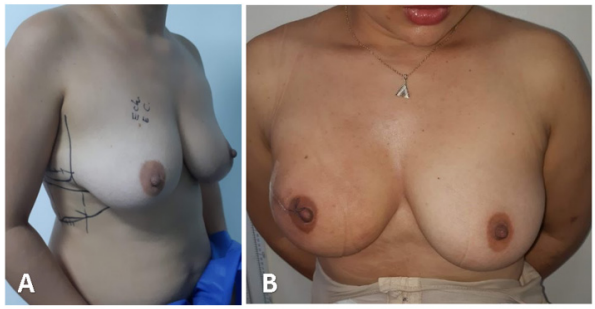

Figure 8: A. Preoperative flap markings. B. One-month postoperative view.

Discussion

Radiotherapy is increasingly being recommended in women with breast cancer, even in early stages. Thanks to neo-adyuvant schemes, patients with locally advanced stages are being considered to breast conserving surgery and immediate breast reconstruction. Nevertheless, the most important factor in determining the time and type of reconstruction is radiotherapy [8].

If a woman is considered for adyuvant radiotherapy, the definitive reconstruction should be delayed (implant-based reconstruction or autologous tissue) and an immediate-delayed or delayed reconstruction are recommended. If radiotherapy is not needed, immediate breast reconstruction offers the best aesthetic results [8].

Not all plastic surgery departments in Colombia have trained staff in microsurgery and there are also administrative difficulties for authorization of implant-based reconstruction, which may delay the oncological treatment. For this reason and considering our health system, the latissimus dorsi flap continues to be a valuable option for immediate breast reconstruction, in this case in nipple and skin sparing mastectomy. It is a less complex procedure that requires less economic and technical resources. It does not delay the start of adjuvant treatments and is more resistant to radiotherapy. It offers a salvage option in cases of nipple-areolar complex and skin necrosis, that can occur in about 4.4.-37.5% and 2-12.7% respectively [9]. This technique permits a one stage reconstruction, with less hospital stay and postoperative follow-up, lowering the health system costs. It avoids the morbidity of harvesting autologous tissue of the abdominal wall and the necessity of utilizing breast prostheses. Compared with other techniques such as TRAM (uni and bipedicled), latissimus dorsi and implant/expander or only implant-based reconstruction the latissimus dorsi flap presented the lowest complication rates. With this new modification we were able to achieve an adequate projection and reconstruction of the breast, with natural results in the long term follow up, avoiding the need of breast implants or more complex procedures [10].

Conclusions

The latissimus dorsi flap continues to be a workhorse flap for immediate breast reconstruction in developing countries where the health services are dependent and regulated by the state. This modification of the latissimus dorsi flap allows the immediate reconstruction of partial and total mastectomy defects, with natural results that last over time, even despite radiotherapy. It is a fast and effective tool in the management of patients with breast cancer independent of breast cancer stage.

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