



Thoracoabdominal flap for locally advanced breast tumor reconstruction in a patient with *BRCA1* mutation

Retalho toracoabdominal para reconstrução de tumor de mama localmente avançado, em paciente com mutação de BRCA1

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■ ABSTRACT

This case report describes the application of the thoracoabdominal flap technique after locally advanced tumor mastectomy in a patient with breast cancer 1 (*BRCA1*) mutation. The mastectomy included resection of nearly the entire left pectoralis major muscle, with homolateral axillary lymphadenectomy and reconstruction of the large chest wall defect with a fasciocutaneous thoracoabdominal flap based on the posterior intercostal arteries.

Keywords: Reconstruction; Plastic surgery; Breast neoplasms; Mutation; Surgical oncology.

■ RESUMO

O presente estudo objetiva relatar a técnica do retalho toracoabdominal pós-mastectomia por tumor localmente avançado em paciente com mutação de *BRCA1*. Foi realizada a mastectomia com ressecção de quase todo o músculo peitoral maior à esquerda, com linfonodectomia axilar homolateral e reconstrução do grande defeito da parede torácica com retalho toracoabdominal fasciocutâneo, baseado nas artérias intercostais posteriores.

Descritores: Reconstrução; Cirurgia plástica; Neoplasias da mama; Mutação; Oncologia cirúrgica.

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INTRODUCTION

Chest wall reconstruction after extensive resection due to advanced breast cancer remains a challenge for oncologic and plastic surgeons. However, in the last decade, improved surgical techniques have allowed extensive resection and reconstruction in patients with tumors involving the chest wall tissue or bone structures, with functional and aesthetic results and cancer-free margins, a critical element for decreased disease recurrence¹.

This case report describes the application of the thoracoabdominal flap technique after locally advanced tumor mastectomy in a patient with breast cancer 1 (*BRCA1*) mutation.

CASE REPORT

A 40-year old woman presented to the oncology service with a locally advanced breast tumor after undergoing chemotherapy and neoadjuvant radiotherapy. She reported the onset of a nodule in her left breast one year before, which grew and progressed after chemotherapy. The tumor was a non-special-type invasive carcinoma of grade T4BN2MO–IIIB (Figure 1), was triple negative, and had a Ki-67 score of 70%. A pathogenic mutation was identified in the *BRCA1* c.3331_3334delCAAG gene (p.Gln1111Asnfs*5). Treatment with three cycles of doxorubicin (60 mg/m²) and cyclophosphamide (600 mg/m²) every 21 days resulted in disease progression. A new treatment with paclitaxel (175 mg/m²) every 21 days showed no clinical response. The patient then underwent combined radiotherapy and chemotherapy with cisplatin (30 mg/m²) and gemcitabine (100 mg/m²) weekly, which showed a partial response (Figure 2). Physical examination showed an ulcerated tumor measuring 30 x 20 cm affecting the entire left breast with confluent, movable left axillary metastasis. Ultrasound revealed two benign nodules (Breast Imaging Reporting and Data System [BI-RADS] III) in the right breast measuring 1.5 cm each at the union of the upper and lateral quadrants. A left mastectomy was indicated, including axillary dissection and resection of both right breast nodules with intraoperative freezing. The patient underwent a left mastectomy with resection of nearly the entire pectoral muscle and homolateral axillary lymphadenectomy up to level three (Figures 3 and 4). The great dorsal plexus and the long thoracic nerve were preserved. Freezing of the margins and resected right nodules were negative for neoplasia. The large defect was reconstructed with a fasciocutaneous thoracoabdominal flap based on the posterior intercostal arteries (Figures 5 and 6). The patient was discharged on the first postoperative day for which she reported low-intensity pain (visual

analog scale 3). The suction drain was removed 10 days after surgery. The small area of flap dehiscence was locally treated and showed good results (Figure 7). Two months after the surgical treatment, the patient continues cancer treatment using capecitabine. After completing chemotherapy, a laparoscopic prophylactic salpingo-oophorectomy is scheduled to evaluate if there is no early disease recurrence. This case report was approved by the Research Ethics Committee (Opinion No. 2,948,415), and the patient provided an informed consent form.



Figure 1. Locally advanced breast tumor before radiotherapy and chemotherapy.



Figure 2. Tumor after radiotherapy and chemotherapy.



Figure 3. Left mastectomy specimen showing involvement of the breast (25 x 20 cm, reduced by 5 cm after radiotherapy).



Figure 5. Thoracoabdominal flap.



Figure 4. Left mastectomy specimen showing involvement of the breast (25 x 20 cm, reduced by 5 cm after radiotherapy).



Figure 6. Breast reconstruction with thoracoabdominal flap.



Figure 7. Healing flap after 15 day.

DISCUSSION

Locally advanced breast carcinoma (LABC) is a grade III cancer (IIIA, IIB and IIIC), defined as tumors measuring >5 cm (T3) or affecting the chest wall (T4a), skin (T4b), or both (T4c) or as extensive lymph node involvement (N2/N3) of one or more lymphatic chains and inflammatory carcinoma. LABC includes 10%–25% of all breast cancers in developed countries and 40%–50% of those in developing countries².

LABC treatment including neoadjuvant chemotherapy, surgery, and radiotherapy, has increased survival rates. Studies prior to the use of neoadjuvant chemotherapy (neo-CT) showed overall survival (OS) of 25% after 5 years. The use of neo-CT resulted in 5-year OS of 80% and 45% in patients with IIIA and IIIB disease, respectively. Thus, neo-CT is recommended in patients with LABC and cases with inadequate response to neo-CT. As in the present study, radiotherapy may make surgical resection easier or more feasible³.

Unilateral breast cancer patients with *BRCA* mutations should undergo contralateral mastectomy when diagnosed at early stages. However, the literature does not support prophylactic contralateral mastectomy (PCM) for locally advanced disease⁴. Based on the literature and joint decision with the patient, PCM

was not performed, since freezing examination of the nodules in the opposite breast showed a fibroadenoma.

Radical surgical removal in these patients results in extensive skin loss in the thoracic region that cannot be repaired with primary closure. The use of flaps, such as myocutaneous flaps, provides effective coverage for major defects but requires longer surgical time, increasing morbidities that may delay additional treatment⁵, especially in patients with triple-negative tumors with residual tumor after neo-CT. In these cases, the administration of capecitabine may increase survival^{6,7}.

However, despite the specific indication for myocutaneous flaps for chest reconstruction after mastectomy, locoregional fasciocutaneous flaps are important. These flaps are quickly made, have low morbidity, and present partial necrosis rates similar to those for myocutaneous flaps, despite the restricted amount of skin that can be mobilized and previous radiotherapy⁸. For these reasons, we applied this technique in the present case.

Regional fasciocutaneous flaps should be well vascularized, as in the present case, based on posterior intercostal artery irrigation to ensure that there is no wall suffering, necrosis, or destabilization⁹.

The extent of resection should always be enough to treat the disease; however, breast reconstruction surgeons are indispensable for surgical planning to make subsequent reconstruction easier¹⁰. Thus, interdisciplinary treatment benefits patients.

CONCLUSION

The results of this study corroborate the use of fasciocutaneous thoracoabdominal flap reconstruction as an effective technique to cover large areas after mastectomy without other flaps or skin grafts. The present case confirmed that interdisciplinary treatment is important for good surgical outcomes.

COLLABORATIONS

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|-------------|--|
| DRSF | Analysis and/or data interpretation, Conception and design study, Data Curation, Final manuscript approval, Methodology, Project Administration, Writing - Original Draft Preparation |
| ALNA | Analysis and/or data interpretation, Conception and design study, Data Curation, Final manuscript approval, Methodology, Project Administration, Realization of operations and/or trials, Writing - Original Draft Preparation |

RJVV Analysis and/or data interpretation, Final manuscript approval, Realization of operations and/or trials, Writing - Original Draft Preparation, Writing - Review & Editing

SCV Analysis and/or data interpretation, Conception and design study, Data Curation, Final manuscript approval, Methodology, Realization of operations and/or trials, Writing - Original Draft Preparation, Writing - Review & Editing

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