

Innovative Strategies for Chest Wall Reconstruction Following Resection of Recurrent Breast Carcinoma

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Abstract : Introduction: We described a case report of the successful use of advanced surgical techniques in a patient with recurrent breast cancer who underwent a wide resection including the hemi-sternum, clavicle, multiple ribs, and a lobe of the lung due to tumor involvement. This extensive resection exposed critical structures, requiring a creative approach to reconstruction. To address this complex chest wall reconstruction, a free fibula flap and a 4-zone rectus abdominis musculocutaneous flap were successfully utilized. The use of a free vascularized bone flap allowed for rapid osteointegration and resistance against osteoradionecrosis after adjuvant radiation, while a four-zone tram flap allowed for reconstruction of both the chest wall and breast mound. Although limited recipient vessels made free flaps challenging, the free fibula flap served as both a bony reconstruction and vascular conduit, supercharged with the distal peroneal artery and veins of the peroneal artery from the fibula graft. Our approach highlights the potential of advanced surgical techniques to improve outcomes in complex cases of chest wall reconstruction in patients with recurrent breast cancer, which is becoming increasingly relevant as breast cancer incidence rates increases. Case presentation: This report describes a successful reconstruction of a patient with recurrent breast cancer who required extensive resection, including the anterior chest wall, clavicle, and sternoclavicular joint. Challenges arose due to the loss of accessory muscles and the non-rigid rib cage, which could lead to compromised ventilation and instability. A free fibula osteocutaneous flap and a four-zone TRAM flap with vascular supercharging were utilized to achieve long-term stability and function. The patient has since fully recovered, and during the review, both flaps remained viable, and chest mound reconstruction was satisfactory. A planned nipple/areolar reconstruction was offered pending the patient's decision after adjuvant radiotherapy. Conclusion: In conclusion, this case report highlights the successful use of innovative surgical techniques in addressing a complex case of recurrent breast cancer requiring extensive resection and radical reconstruction. Our approach, utilized a combination of a free fibula flap and a 4-zone rectus abdominis musculocutaneous flap, demonstrates the potential for advanced techniques in chest wall reconstruction to minimize complications and ensure long-term stability and function. As the incidence of breast cancer continues to rise, it is crucial that healthcare professionals explore and utilize innovative techniques to improve patient outcomes and quality of life.

Keywords : free fibula flap, rectus abdominis musculocutaneous flap, post-adjuvant radiotherapy, reconstructive surgery, malignancy

Conference Title : ICAPRAS 2023 : International Conference on Advanced Plastic, Reconstructive and Aesthetic Surgery

Conference Location : Singapore, Singapore

Conference Dates : September 04-05, 2023