Surgical treatment of extensive and multiple skin cancers via excision and reconstruction using multiple flaps: a case report

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A 47-year-old male patient presented with multiple squamous and basal cell carcinomas on the anterior chest, back, and left cheek. The patient experienced odorous discharge from the tumors. Surgical excision was planned, beginning with the anterior chest squamous cell carcinoma. An extensive 32×30 cm cutaneous defect was created, which was covered by a bilateral deep inferior epigastric perforator and pedicled latissimus dorsi myocutaneous flaps. The basal cell carcinomas on the back and squamous cell carcinoma on the left cheek were serially excised, after which the left cheek wound required flap coverage. Postoperative complications such as venous thrombosis and infection led to several reoperations, yet the extensive defect was successfully reconstructed. No local recurrence developed during 31 months of follow-up. We report this case to demonstrate that although the wide excision of very large skin cancers may result in extensive and challenging defects as large as 5.8% of the total body surface area, coverage with appropriate flaps may lead to successful oncologic outcomes and improve the patient’s quality of life.

Keywords: Skin neoplasms, Free flaps, Reconstructive surgical procedures, Microsurgery

Introduction

Skin cancer is the most commonly diagnosed cancer in the United States, with approximately 1.8 million cases of cutaneous squamous cell carcinomas diagnosed each year [1]. Surgical excision with acceptable cosmetic results remains the mainstay of treatment in most cases [2]. Extensive and multiple skin cancers are often considered inoperable and are treated with chemotherapy, radiotherapy, or immunotherapy. However, only about 30% of patients respond to any type of nonsurgical treatment [3]. Unresected cancer with persistent odor and pain diminishes the patient’s quality of life and poses a significant risk for both morbidity and mortality [4]. However, recent advances in microsurgery have enabled successful resection and reconstruction of extensive skin cancers that were previously considered inoperable.

In this case report, we present a case of extensive and multifocal skin cancers on the chest wall and face, and their successful resection and reconstruction using bilateral deep inferior epigastric perforator (DIEP), anterolateral thigh (ALT), and pedicled latissimus dorsi musculocutaneous (LDMC) flaps. This report aims to highlight the effectiveness of free tissue transfer in achieving optimal outcomes in an extensive skin cancer patient.
Case report

This study was approved by the Institutional Review Board of Samsung Medical Center (No. 2024-05-075). Written informed consent was obtained from the patient for the publication of this report including all clinical images.

A 47-year-old Caucasian male patient presented to the clinic with pain and odorous discharge from massive and multiple tumors of the face and chest wall. The patient commented that he had previously visited other hospitals to consult for surgical resection but had been rejected due to the size and multifocality of the cancer. The patient demanded an instant resolution of the odorous discharge. He had a family history of basal cell carcinoma in his brothers, and a hobby of outdoor fishing more than once a week. Physical examination and tissue biopsy confirmed a 6 × 7 cm sized squamous cell carcinoma on the patient’s left cheek, a 26.5 × 25.0 cm sized squamous cell carcinoma on the anterior chest wall, and multiple basal cell carcinomas in the back (Fig. 1). Preoperative imaging studies revealed no distant metastasis but a locally advanced disease with regional lymph node metastases in bilateral neck level II, supraclavicular, and axillary areas. A multidisciplinary discussion with the surgical, radiology, and oncology teams led to a conclusion of palliative tumor resection with adjuvant therapy. Staged excision of the tumors was planned, starting from the front to the back.

A wide excision of the anterior chest tumor was performed

![Fig. 1. (A) The extensive squamous cell carcinoma on the anterior chest wall measured 26.5×25 cm. (B) Multiple basal cell carcinomas were present on the patient’s back. (C) A staged excision was planned for the patient’s left cheek mass.](image)

![Fig. 2. (A) A 32×30 cm defect resulted on the anterior chest wall (4.4% loss of total body surface area). The pectoralis major muscle was excised due to cancer invasion. (B) The anterior chest wall mass was resected with a safety margin of 2 cm.](image)
with a safety margin of 2 cm. A frozen biopsy confirmed tumor infiltration in the deep margins. Pectoralis major muscle and major blood vessels including right thoracoacromial and internal mammary vessels were further excised. A resultant 32 × 30 cm sized defect, which was about 4.4% of the patient’s total body surface area, was created on the anterior chest (Fig. 2). Considering the supine position, donor site morbidity, and the need for solid tissue coverage that can endure adjuvant therapy, reconstruction using bilateral DIEP flaps and ALT flap was planned.

A bilateral DIEP flap sized 40 × 15 cm including one right deep inferior epigastric artery (DIEA) perforator and two left DIEA perforators was elevated from the patient’s abdomen and a 10.5 × 23.0 cm sized ALT flap was elevated from the right thigh. The DIEP flap was cut in half for adequate positioning of the flaps. Right DIEA was anastomosed to the left internal mammary artery (IMA), the only remaining sizeable vessel in the anterior chest, in an end-to-end fashion. The pedicle of the ALT flap was anastomosed to a single lateral branch of the right DIEA in an end-to-end fashion, and the left DIEP was anastomosed to the lateral circumflex femoral artery (LCFA) in an end-to-side fashion. During the anastomosis, the left deep infe-

Fig. 3. (A) Bilateral deep inferior epigastric perforator (DIEP) flaps. (B) Anterolateral thigh (ALT) flap from the patient’s right thigh. (C) Right DIEP flap on the left chest, left DIEP flap on the right chest, and ALT flap on the lower side. (D) Initial vessel anastomoses. (E) Anastomosis after revisional surgery. Lt, left; IMA, internal mammary artery; LCf, lateral circumflex femoral vein; LCFA, lateral circumflex femoral artery; DIEV, deep inferior epigastric vein; DIEA, deep inferior epigastric artery.
rior epigastric vein (DIEV) and lateral circumflex femoral vein (LCFV) demonstrated some degree of size mismatch. However, anastomosis between the two vessels was inevitable due to the lack of another viable recipient vessel. Continuous extravascular irrigation with 4% lidocaine and intravenous prostaglandin E1 infusion was done to prevent vasoconstriction and induce vasodilation. Each flap was positioned on the chest wall considering the length and tension of each pedicle. Flap trimming and wound closure was done (Fig. 3).

The patient was closely monitored during the postoperative period. Within 24 hours, the left DIEP flap on the patient's right chest showed congestive color change and a capillary refill time of less than 1 second, suggesting venous insufficiency. Flap exploration revealed good pulsation of left DIEA and intraluminal thrombosis of left DIEV. The left DIEP flap pedicle was disconnected from the ALT pedicle for mechanical thrombolysis and heparin irrigation. Soft tissue dissection was performed to find a new, sizeable vessel for anastomosis with left DIEV. Left thoracoacromial vessels were found and anastomosed with the left DIEP flap with a vessel graft situated in between. The right DIEP flap maintained its anastomosis with the left IMA and LCFA. Considering the length of each pedicle, the left DIEP flap was repositioned to the left chest, the right DIEP flap to the inferior aspect of the chest wall, and the ALT flap to the right chest.

At 5 days postoperatively, the ALT flap showed infection signs with purulent discharge. Infectious organisms from the original tumor had contaminated the field, causing venous congestion and consequent failure of the ALT flap. We waited for a few more days until the patient had recovered his full condition to replace the flap and excise the left cheek lesion at the same time. The ALT flap was replaced with a pedicled latissimus dorsi myocutaneous flap and the left cheek mass was resected and reconstructed with a new ALT flap from the left thigh. During the operation, massive irrigation was done to prevent the infectious cheek mass from contaminating the surgical field. The postoperative course was uneventful.

Surgical resection of the basal cell carcinomas of the back took place after 4 months when the anterior chest flaps gained enough stability to endure a prone position. During the 33-month follow-up period, progressive enlargement of the left neck metastatic lymph nodes was observed, resulting in systemic immunotherapy and radiotherapy on the left neck.

Several basal cell carcinomas were removed from the patient's face. Otherwise, the patient exhibited no sign of local recurrence in the skin, and the flaps maintained their structural integrity throughout adjuvant therapies (Fig. 4). The patient could enjoy his life again, surfing and fishing every weekend. Although cancer remains in his neck lymph nodes, palliative intent to improve the patient's quality of life has been a success.

Discussion

In this study, we report a case of resection and reconstruction of extensive and multifocal skin cancers of the trunk and face in
a palliative setting. Cancer cells remain in the patient’s deep neck, yet the patient no longer suffers from pain and odor and has regained his normal life.

Locally advanced skin cancers are sometimes considered inoperable and are treated with chemotherapy, radiotherapy, or immunotherapy instead of surgical resection. In this case report, the patient had locally advanced disease with multifocal cancers and regional lymph node metastasis. Nonetheless, palliative surgical resection was planned as pain and odor from the cancer were causing a significant decline in the patient’s quality of life.

Tumor resection was successful, but our team faced several challenges during and after the surgery. The defect required a tissue that is larger than a pedicled LDMC flap, but a bilateral LDMC flap would have led to the compression of one flap while the other side was being harvested. Negative pressure wound therapy with skin graft is usually suitable for anterior chest defect [5] but was inadequate in our case as the patient had to undergo adjuvant therapy and had less time to tolerate delayed wound healing or cancer penetration through the graft. Hence, solid tissue coverage using free tissue transfer was decided. The microsurgical anastomosis was challenging due to the lack of sizeable recipient vessels. Two main recipient vessels of the anterior chest area, the internal mammary vessels and thoracoacromial vessels, were both sacrificed on the right side due to cancer invasion. Flaps on the right side of the chest had to be anastomosed to flaps or vessels on the left side, requiring long pedicles and a vessel graft. Size mismatch between left DIEV and LCFV as well as the burden of three flaps being connected to a single, small recipient vessel resulted in venous congestion of the left DIEP flap. Pedicle elongation using vessel graft and reanastomosis of left DIEP with a sizeable vessel was inevitable.

The potential risk of microorganisms within the malignant fungating wound [6] was undertaken in our case, which led to postoperative infection and subsequent removal of the ALT flap. A pedicled LDMC flap was used to replace the ALT flap because the recipient site lacked a vessel for free flap transfer and solid tissue was necessary for infection control. In the subsequent operations, extra caution was taken to prevent infection whenever a tumor with an open wound or infectious discharge was present in the operative field.

The patient had previously sought opinions from other institutions, all of which recommended palliative chemotherapy instead of surgical resection. In a palliative setting like his, extensive removal and free flap coverage is usually not recommended. The patient, however, had a huge, infectious open wound in the anterior chest which could have led to septic shock during chemotherapy. Also, pain and discharge from the wound had diminished the patient’s quality of life. Although curative surgery was not possible, we recognized that palliative cancer resection and solid tissue reconstruction may improve the patient’s quality of life and enable adjuvant therapy in a stable setting.

This case yielded important lessons. As squamous cell carcinoma with odorous discharge may harbor microorganisms [6], intraoperative saline irrigation with minimal contact with the tumor surface is imperative to prevent postoperative infections. Also, harvesting the DIEP flap increased the size of the defect. Other options such as a latissimus dorsi flap with an additional free flap from a distant area may have enabled the advancement of surrounding tissues and reduced the size of defect, as done in previous studies [7]. Meticulous preoperative planning should be done, including the size, length, location of recipient vessels, and the need for vessel graft, before selecting a donor tissue. Most importantly, surgical resection should be considered first for the treatment of skin cancer, for the sake of patient survival and improved quality of life.

In conclusion, surgical excision and free tissue transfer can be an effective treatment modality for extensive and locally advanced skin cancer patients. The presented case of chest wall reconstruction using bilateral DIEP flaps and a pedicled LDMC flap demonstrates the efficacy of this approach in achieving successful cancer resection, defect coverage, and optimal wound healing. Despite major complications, careful management and intervention led to a favorable outcome for the patient. This case highlights the importance of palliative resection in the management of skin cancer, as well as the efficacy of using a bilateral DIEP flap and a pedicled LDMC flap for the reconstruction of large anterior chest wall defects.

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The authors have nothing to disclose.

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**References**

1. Siegel RL, Miller KD, Wagle NS, Jemal A. Cancer statistics,


