

Pectoralis Major Flap as a Reconstructive Alternative for Cervical Skin Defects Following Oncologic Parotid Surgery: A Case Report

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ABSTRACT

Background: Malignant neoplasms of the parotid gland constitute an uncommon and heterogeneous group of head and neck tumors. Their management is challenging because of the gland's close anatomical relationship with the facial nerve, major cervical vessels, and regional lymph nodes. In locally advanced tumors, oncologic resection may result in extensive cervicofacial defects that require immediate reconstruction with vascularized tissue.

Case Report: A 62-year-old female patient was diagnosed with a high-grade malignant neoplasm of the left parotid gland. Computed tomography revealed a solid, irregular, hypodense lesion within the parotid space, with loss of the interface with the sternocleidomastoid muscle, coarse calcification, and cervical lymph node conglomerates. During surgical exploration, an approximately 12 × 8 cm stony-hard mass was identified, involving the facial nerve, internal jugular vein, and sternocleidomastoid muscle. A left total parotidectomy combined with a modified radical neck dissection was performed. The resection resulted in a complex cervicofacial defect measuring approximately 12 × 8 cm, with loss of cutaneous coverage and exposure of cervical structures. Immediate reconstruction was achieved using a left pectoralis major myocutaneous flap, transferred through a cervicothoracic subcutaneous tunnel. The flap provided stable coverage, well-vascularized tissue, and sufficient bulk to protect the exposed structures and partially restore the cervicofacial contour. The postoperative course demonstrated satisfactory flap integration and viability.

Conclusion: The management of locally advanced high-grade parotid malignancies requires the integration of radical oncologic resection with an immediate reconstructive strategy. The pectoralis major myocutaneous flap represents a reliable, versatile, and technically reproducible option for reconstructing extensive cervicofacial defects, obliterating dead space, and protecting vital neurovascular structures, particularly when rapid reconstruction is required or microvascular free tissue transfer is not feasible.

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INTRODUCTION

Extensive oncologic resections involving the parotid and cervical regions may result in complex defects characterized by the loss of skin, subcutaneous tissue, fascia, and muscle, as well as exposure of major cervical vessels, nerves, and bony structures. These defects not only produce significant aesthetic deformity due to loss of facial contour but also increase the risk of infection, wound dehiscence, skin necrosis, and vascular injury. Therefore, immediate reconstruction constitutes an essential component of comprehensive treatment by providing durable soft-tissue coverage, supplying well-vascularized tissue, obliterating dead space, and facilitating the timely initiation of adjuvant therapy.

The pectoralis major myocutaneous flap remains a reliable reconstructive option for extensive head and neck defects. Its consistent vascular anatomy, based primarily on the pectoral branch of the thoracoacromial artery, allows harvest of a bulky muscle flap with a variably sized skin paddle. Its proximity to the cervical region permits transfer through a subcutaneous tunnel without the need for microvascular anastomosis. Furthermore, it provides effective coverage of exposed neurovascular structures, obliterates tissue cavities, and partially restores the lost soft-tissue volume. These characteristics make it particularly valuable in patients with extensive defects, significant comorbidities, radical resections, or clinical scenarios in which rapid and reliable reconstruction is required.

CASE PRESENTATION

A 62-year-old female patient was diagnosed with a high-grade malignant neoplasm of the left parotid gland. Her past medical history was negative for diabetes mellitus, systemic arterial hypertension, and drug allergies. She reported active tobacco use since the age of 15 years, with a current consumption of 2–3 cigarettes per day and a previous maximum of 10 cigarettes daily for 3 years. She also reported occasional alcohol consumption without episodes of intoxication. Her surgical history included a hysterectomy performed 21 years earlier for endometriosis and right carpal tunnel release 12 years before presentation. She denied any history of blood transfusions.

Contrast-enhanced computed tomography of the neck demonstrated an irregular hypodense solid mass within the left parotid space, involving the parotid gland and showing loss of the tissue plane with the sternocleidomastoid muscle, accompanied by coarse calcification. The lesion compressed and displaced the ipsilateral common carotid artery and internal jugular vein and measured approximately 63 × 45 mm. Left cervical lymphadenopathy was identified,

including a nodal conglomerate measuring 39 × 26 mm involving levels IIA, IIB, and III. Computed tomography of the chest revealed no pulmonary masses, mediastinal lymphadenopathy, or lytic or blastic osseous lesions.

I. Surgical Technique

A left total parotidectomy combined with a left modified radical neck dissection and immediate reconstruction using a left pectoralis major myocutaneous flap was performed. Under balanced general anesthesia, a modified Blair incision was used to perform cervical lymph node dissection of levels I–V while preserving the spinal accessory nerve. Subsequently, the parotid gland was dissected with identification of the main trunk and branches of the facial nerve. Intraoperatively, a stony-hard parotid mass measuring approximately 12 × 8 cm was identified, demonstrating tumor involvement of the facial nerve, internal jugular vein, and sternocleidomastoid muscle. Cervical lymphadenopathy involving levels I–V was also noted.

Following oncologic resection, an extensive soft-tissue defect measuring approximately 12 × 8 cm was evident over the left lateral face, prompting immediate reconstruction by the Plastic and Reconstructive Surgery team using a tunneled left pectoralis major myocutaneous flap. (*Figure 1*) The pectoralis major muscle was meticulously dissected and elevated, followed by careful hemostasis and layered wound closure. Closed-suction (Biovac) drains were placed in both the recipient bed and the donor site. The procedure was completed without intraoperative complications. (*Figure 2 and 3*)

Histopathological examination confirmed a high-grade malignant neoplasm arising from the left parotid gland. The postoperative course was favorable, with successful reconstruction of the surgical defect using the pectoralis major myocutaneous flap, resulting in durable soft-tissue coverage, restoration of regional volume, and effective



Figure 1. Cervical soft-tissue defect following parotid tumor resection.

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Figure 2. Inset of the pectoralis major muscle into the soft-tissue defect of the left hemineck.

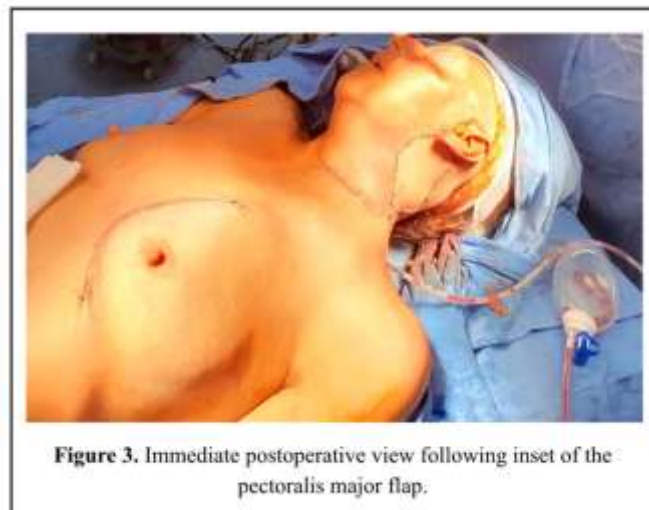


Figure 3. Immediate postoperative view following inset of the pectoralis major flap.

DISCUSSION

Salivary gland cancer is an uncommon malignancy within the spectrum of head and neck oncology; however, its rarity should not be mistaken for biological simplicity. Rather, it comprises an extraordinarily heterogeneous group of neoplasms, encompassing more than twenty recognized epithelial histological subtypes in the current classification system. These tumors exhibit a wide spectrum of clinical behavior, ranging from low-grade lesions with an indolent course to highly aggressive carcinomas characterized by perineural invasion, regional lymph node metastasis, and distant dissemination. Epidemiologically, salivary gland malignancies account for less than 1% of all cancers and approximately 1–5% of head and neck neoplasms. Recent global epidemiological data indicate that, although the overall incidence remains low, considerable geographic variation exists, with a modest upward trend reported in

some population-based studies. Among the major salivary glands, the parotid gland is the most common site of origin for these malignancies.

From a clinical perspective, the parotid gland harbors the majority of salivary gland tumors. Although most parotid lesions are benign, the malignant subset demands a distinct surgical approach because of its intimate relationship with the facial nerve, the presence of intraparotid lymph nodes, and its close proximity to the external carotid artery, retromandibular vein, parapharyngeal space, and upper cervical lymphatic levels. This complex anatomy explains why parotid cancer cannot be regarded merely as a glandular neoplasm; rather, it should be considered a regional disease that frequently involves adjacent muscular planes, neural pathways, and lymphatic compartments.

The most well-established risk factors for salivary gland malignancies include prior exposure to ionizing radiation and certain occupational exposures. In contrast, the association with tobacco and alcohol is less consistent than that observed in mucosal head and neck squamous cell carcinoma. Ionizing radiation has the strongest historical association with salivary gland carcinogenesis, whereas tobacco use is more clearly linked to Warthin tumor, a benign neoplasm, than to salivary gland carcinomas as a whole. Nevertheless, recent epidemiological studies continue to investigate the potential contribution of tobacco use, obesity, and socioeconomic factors to the population-level risk of salivary gland cancer. In the present patient, active tobacco use cannot be considered the sole etiologic factor; however, it should be recognized as a clinically unfavorable variable in both the oncologic and reconstructive settings.

Histologically, the most common malignant salivary gland neoplasms include mucoepidermoid carcinoma, adenoid cystic carcinoma, acinic cell carcinoma, salivary duct carcinoma, and carcinoma ex pleomorphic adenoma, among others. Mucoepidermoid carcinoma is generally regarded as the most frequent malignant subtype in adults, whereas high-grade malignancies—particularly salivary duct carcinoma and poorly differentiated carcinomas—account for a substantial proportion of disease-related morbidity and mortality because of their propensity for perineural invasion, locoregional recurrence, and distant metastasis. The fifth edition of the World Health Organization classification has further emphasized the diagnostic value of defining molecular alterations, particularly in histologically challenging cases.

I. Surgical Anatomy of the Parotid and Cervical Regions

A thorough understanding of parotid anatomy is essential for interpreting both tumor extension and the rationale underlying oncologic resection. The parotid gland is located within the retromandibular fossa, bounded superiorly by the zygomatic arch, anteriorly by the masseter muscle, and posteriorly by the sternocleidomastoid muscle.

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It consists of superficial and deep lobes, which are functionally separated by the course of the facial nerve and its associated venous structures. The Stensen duct arises from the superficial lobe, traverses the masseter muscle, and pierces the buccinator to open opposite the maxillary second molar. This anatomical configuration explains why large parotid tumors may distort the facial contour, infiltrate the overlying skin, involve the masseter muscle, or extend into the parapharyngeal space.

The relationship between the facial nerve and the parotid gland is the cornerstone of parotid surgery. The main trunk exits the stylomastoid foramen, enters the parotid gland, and arborizes into its terminal branches within the glandular parenchyma. From a surgical standpoint, nerve preservation is not governed by a dogmatic principle but rather by the ability to establish a safe dissection plane between the tumor and the nerve. In high-grade carcinomas, the presence of preoperative facial paralysis or gross intraoperative nerve involvement necessitates partial or complete facial nerve resection, which should be regarded not as a complication but as an essential component of achieving adequate oncologic clearance.

Another anatomical feature of major clinical significance is the presence of intraparotid and periparotid lymph nodes. The parotid gland is the only major salivary gland containing two distinct nodal basins, explaining its dual role as both the primary site of salivary gland malignancies with intraglandular nodal dissemination and a frequent site of metastasis from cutaneous malignancies of the scalp, forehead, and auricle. In primary parotid carcinoma, this anatomical characteristic supports the contemporary recommendation that surgical management should not be limited to simple tumor excision but should instead include an appropriately tailored glandular resection based on tumor grade, anatomical location, and disease stage.

The adjacent cervical region completes this oncologic anatomical landscape. Posteriorly, the parotid gland is closely related to the sternocleidomastoid muscle, while its deep aspect lies in intimate proximity to the external carotid artery and its branches, the retromandibular vein, and the carotid–jugular vascular axis. When computed tomography demonstrates obliteration of the fat plane between the tumor and the sternocleidomastoid muscle, vascular displacement or compression, and confluent lymphadenopathy involving cervical levels II and III, the radiologist is describing not merely tumor extension but imaging features that anticipate the need for an extended oncologic resection and, frequently, immediate reconstruction to protect exposed vital structures. This scenario is exemplified in the present case, in which the disease progressed beyond a strictly parotid neoplasm to become a complex cervicofacial oncologic defect requiring comprehensive ablative and reconstructive management.

II. CLINICAL AND IMAGING DIAGNOSIS

From a clinical standpoint, a painless, slowly enlarging parotid mass is more commonly associated with a benign lesion. However, persistent pain, skin fixation, rapid growth, sensory disturbances, ulceration, cervical lymphadenopathy, and, most importantly, facial nerve dysfunction should be regarded as red flags for malignancy. Facial nerve weakness in association with a parotid tumor is an ominous clinical finding and is exceedingly uncommon in benign lesions. Consequently, its presence should prompt expedited staging investigations and comprehensive oncologic treatment planning.

The contemporary diagnostic approach integrates clinical evaluation, cytopathologic assessment, and cross-sectional imaging. Current guidelines from the American Society of Clinical Oncology (ASCO) recommend imaging with ultrasonography, contrast-enhanced computed tomography, and/or magnetic resonance imaging, depending on the clinical scenario, together with fine-needle aspiration or core needle biopsy to distinguish malignant from non-malignant lesions. In clinical practice, fine-needle aspiration cytology remains a valuable first-line diagnostic modality, particularly when interpreted using standardized risk stratification systems such as the Milan System for Reporting Salivary Gland Cytopathology. Core needle biopsy is especially useful when fine-needle aspiration yields insufficient material or when the anatomical location limits adequate cytologic sampling.

Ultrasonography plays an important role as the initial imaging modality for the evaluation of a palpable salivary gland swelling, particularly for confirming the presence of a tumor and guiding tissue sampling. However, cross-sectional imaging constitutes the cornerstone of the diagnostic workup when advanced parotid carcinoma is suspected. The French REFCOR guidelines recommend ultrasonography for any salivary gland enlargement persisting for more than three weeks. For the characterization of salivary gland tumors, magnetic resonance imaging with diffusion-weighted sequences and dynamic contrast enhancement is the preferred modality. When a lesion is histologically confirmed or highly suspicious for malignancy, contrast-enhanced computed tomography of the neck and chest is recommended to assess the primary tumor, regional lymph nodes, and distant metastatic disease.

Magnetic resonance imaging provides superior delineation of soft-tissue extension, perineural spread, and skull base involvement. Nevertheless, the role of computed tomography remains fundamental and is often underestimated. CT offers particularly valuable information regarding tumor calcifications, osseous erosion, obliteration of fat planes, invasion of adjacent musculature, the relationship of the tumor to major cervical vessels, cervical nodal architecture, and thoracic evaluation for metastatic disease. The American Society of Clinical Oncology

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(ASCO) guidelines recommend contrast-enhanced CT when osseous involvement is suspected, while the REFCOR recommendations identify contrast-enhanced CT of the neck and chest as a central component of disease staging. Moreover, recent radiologic reviews have emphasized that irregular margins, ill-defined borders, and infiltration of adjacent tissues are imaging features highly suggestive of parotid malignancy.

In the present case, computed tomography was not merely an ancillary examination but rather the imaging study that guided therapeutic decision-making. The identification of an irregular hypodense lesion within the left parotid space, associated with coarse calcification, obliteration of the fat plane with the sternocleidomastoid muscle, compression and displacement of the common carotid artery and internal jugular vein, together with confluent lymphadenopathy involving cervical levels IIA, IIB, and III, established the diagnosis of locally advanced disease. From a surgical planning perspective, these findings anticipated three critical considerations: the need for an extensive oncologic resection, a high likelihood of requiring cervical lymph node dissection, and the creation of a substantial soft-tissue defect with exposure of vital cervical structures.

¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography (¹⁸F-FDG PET/CT) is not recommended as a routine first-line imaging modality for all salivary gland masses; however, it may be considered in patients with advanced, high-grade tumors. The American Society of Clinical Oncology (ASCO) guidelines recognize PET/CT as a reasonable option for staging advanced high-grade salivary gland carcinomas, whereas the French REFCOR guidelines adopt a more conservative approach regarding its routine initial use. This distinction is clinically relevant: PET/CT should not replace contrast-enhanced CT of the neck and chest or magnetic resonance imaging but may provide additional value for staging, detection of recurrent disease, and prognostic assessment in carefully selected patients.

III. ONCOLOGIC SURGICAL MANAGEMENT

Curative treatment of localized or locally resectable parotid carcinoma remains fundamentally surgical. The primary objective is not simply to remove the tumor mass but to achieve negative surgical margins while ensuring adequate control of intraglandular, perineural, and regional lymphatic disease. It is important to avoid oversimplification, as the extent of parotidectomy should be individualized according to histologic grade, tumor location, size, involvement of the deep lobe, facial nerve status, and the presence of clinically or radiologically evident cervical lymph node metastases.

Current evidence-based guidelines converge on a central principle. In small (T1–T2), low-grade tumors confined to the superficial lobe, partial superficial

parotidectomy may be considered when the lesion is favorably located and can be excised with adequate oncologic margins. However, management should be considerably more extensive for high-grade carcinomas or advanced-stage (T3–T4) tumors. The American Society of Clinical Oncology (ASCO) recommends at least a superficial parotidectomy, with subtotal or total parotidectomy considered for all advanced-stage or high-grade parotid malignancies. Likewise, the French REFCOR guidelines regard total parotidectomy as the standard surgical approach for parotid carcinoma, with the goal of achieving clear margins and removing intraparotid lymph nodes. In clinical practice, therefore, limited parotid resection is reserved for highly selected cases and is not appropriate for bulky, biologically aggressive tumors such as the one described in the present report.

Management of the facial nerve should be guided by oncologic principles rather than anatomical preservation alone. When preoperative facial nerve function is intact and a clear dissection plane exists between the tumor and the nerve, preservation is appropriate. Conversely, in the presence of preoperative facial paralysis or when the main trunk or any of its branches is grossly involved by biopsy-confirmed malignancy, resection of the affected nerve segment is recommended by current clinical guidelines. This principle is particularly critical in high-grade tumors, in which non-oncologic nerve preservation may result in positive surgical margins and an increased risk of early locoregional recurrence.

The decision to perform cervical lymph node dissection is based on the clinical nodal status and the estimated risk of occult nodal metastasis, which is strongly influenced by the tumor's histologic grade. The French REFCOR guidelines recommend ipsilateral neck dissection in patients with clinically node-positive (cN+) disease. In clinically node-negative (cN0) patients, elective treatment of the neck is also recommended, except in tumors with a very low risk of occult nodal metastasis. Similarly, the American Society of Clinical Oncology (ASCO) guidelines recommend elective neck treatment for patients with clinically negative necks who harbor T3–T4 tumors or high-grade salivary gland malignancies. For parotid carcinoma, elective selective neck dissection generally includes cervical levels II–IV, whereas in patients with cN1 disease or a greater nodal burden, the dissection may be extended to levels I–V according to the distribution of nodal involvement and the anticipated pattern of regional spread.

Accordingly, the indication for total parotidectomy combined with modified radical neck dissection in the present 62-year-old patient is fully supported by the current evidence. The presence of a high-grade, bulky tumor, probable invasion of adjacent structures, multiple metastatic cervical lymph nodes, and intraoperative involvement of the facial nerve, internal jugular vein, and sternocleidomastoid muscle justified an aggressive surgical approach to achieve

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optimal oncologic control. Preservation of the spinal accessory nerve during cervical lymphadenectomy is consistent with the principles of modified radical neck dissection whenever oncologically feasible, thereby reducing postoperative functional morbidity without compromising the radicality of resection.

Finally, surgery alone is rarely sufficient for the management of high-risk salivary gland carcinomas. Postoperative radiotherapy is indicated for high-grade tumors, positive surgical margins, perineural invasion, regional lymph node metastases, lymphovascular invasion, and T3–T4 disease. Consequently, immediate reconstruction should be regarded not merely as a means of closing the surgical defect but as an integral component of multidisciplinary oncologic management. Its purpose is to establish a durable, well-vascularized wound bed capable of withstanding subsequent adjuvant therapy while minimizing the risks of wound dehiscence, flap breakdown, and exposure of critical cervical neurovascular structures.

IV. ANATOMICAL BASIS AND CLASSIFICATION OF THE PECTORALIS MAJOR FLAP

The pectoralis major flap remains a cornerstone of reconstructive surgery because its value is founded not on reconstructive trends but on its consistent and reliable anatomy. The pectoralis major is the largest and most superficial muscle of the anterior chest wall. It originates from the medial half of the clavicle, the anterior surface of the sternum, the upper costal cartilages, and the aponeurosis of the external oblique muscle, and inserts onto the lateral lip of the intertubercular (bicipital) groove of the humerus. Functionally, it comprises clavicular and sternocostal portions and forms a substantial component of the anterior wall of the axilla.

From a reconstructive perspective, its defining characteristic is its vascular anatomy. The dominant blood supply arises from the pectoral branch of the thoracoacromial artery, with additional segmental vascular contributions from secondary pedicles, including the lateral thoracic artery and parasternal perforating vessels. Accordingly, the pectoralis major is classified as a **Type V muscle** according to the **Mathes and Nahai** vascular classification, possessing one dominant vascular pedicle and multiple secondary segmental pedicles. This classification is not merely of academic interest; rather, it explains the reliability of the muscle as a pedicled flap, permits the inclusion of a myocutaneous skin paddle, and accounts for its relatively low risk of ischemia and necrosis when the dominant vascular pedicle is meticulously preserved.

The pectoralis major muscle is innervated by the medial and lateral pectoral nerves, a consideration that extends beyond anatomical relevance to encompass donor-site morbidity. Partial or complete sacrifice of the muscle results in measurable functional impairment, particularly affecting shoulder adduction, flexion, and internal rotation. The most

recent systematic review of donor-site morbidity demonstrated persistent reductions in shoulder range of motion and muscle strength across a substantial proportion of studies, with functional limitations affecting shoulder-related activities for up to one year following reconstruction. Thus, although the pectoralis major flap remains an invaluable reconstructive option, it is not without functional consequences at the donor site.

Several variants of the pectoralis major flap have been described, including the pectoralis major myocutaneous flap, the myofascial flap, and bipaddle or bilobed configurations designed for complex composite defects. The myocutaneous flap is preferred when both external soft-tissue coverage and restoration of tissue volume are required, whereas the myofascial flap is particularly useful when the primary objective is to provide well-vascularized muscle for the protection of major vessels or reinforcement of wound closure, with split-thickness skin grafting performed when external epithelial coverage is necessary. This distinction is especially relevant in cervical reconstruction, as not all neck defects require a cutaneous skin paddle; however, many demand robust vascularized muscle coverage to protect the carotid vascular axis.

V. CERVICAL SOFT-TISSUE RECONSTRUCTION WITH THE PECTORALIS MAJOR FLAP

In the era of free tissue transfer, the pectoralis major flap is no longer considered the universal reconstructive option for all cervicofacial defects. Nevertheless, contemporary evidence has redefined its role, not as an obsolete technique, but as a highly valuable reconstructive option in complex clinical scenarios, including previously irradiated or infected necks, compromised recipient vessels, patients with significant comorbidities, situations requiring shorter operative times, extensive cutaneous defects with carotid artery exposure, salvage reconstruction, and cases in which microvascular free tissue transfer is not the most appropriate strategy. A recent review by Dimovska and colleagues, conducted at a high-volume center with extensive microsurgical experience, concluded that the pectoralis major myocutaneous flap (PMMC) should be reserved for high-risk neck reconstructions, medically complex patients, and circumstances in which free flap reconstruction is either contraindicated or no longer feasible.

The role of the pectoralis major flap in cervical soft-tissue reconstruction is particularly well established when major cervical vessels are exposed, when extensive skin and subcutaneous tissue loss is present, or when obliteration of a large dead space is required following radical ablative surgery. Classical surgical protocols and the cumulative experience in head and neck reconstruction have consistently demonstrated that the muscular component provides durable protection of the carotid vascular axis, particularly in previously irradiated patients or in those at high risk of wound dehiscence. This capacity to provide a

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"biological shield" through the transfer of well-vascularized tissue remains one of the principal reasons why the pectoralis major flap continues to represent a rational reconstructive choice following extensive oncologic parotidectomy and comprehensive neck dissection.

Successful elevation of the pectoralis major flap requires meticulous adherence to anatomical principles. Flap design begins with outlining the skin paddle over the muscle, typically in its inferomedial portion, where reliable musculocutaneous perforators are concentrated. The flap is elevated by incorporating the overlying fascia and an adequate amount of muscle beneath the skin paddle, proceeding from the thoracic region toward the cephalad direction until the pectoral branch of the thoracoacromial artery is safely identified and preserved. To increase the arc of rotation, division of the lateral thoracic artery may be necessary, provided that the dominant vascular pedicle remains intact. The flap is subsequently transferred to the cervical region through a sufficiently wide subcutaneous tunnel, avoiding pedicle torsion, compression, or acute angulation as it traverses the clavicle.

Several technical considerations are critical to flap viability and should be emphasized. First, the skin paddle should not be excessively undermined from the underlying muscle, as excessive adipose tissue or inadequate muscular support increases the risk of partial skin paddle ischemia. Second, the cervical tunnel must be wide enough to prevent compression of the vascular pedicle. Third, meticulous hemostasis of the donor site is essential because of the risk of retracted bleeding vessels within the thoracic wound. Fourth, closed-suction drains should be positioned so as not to cross or compress the vascular pedicle. Finally, the donor site should be closed in anatomical layers whenever primary closure is feasible; larger defects may require skin grafting or additional locoregional reconstructive techniques. Recent clinical series have further suggested that preservation of the lateral thoracic artery during harvest of large pectoralis major flaps may reduce certain flap-related complications, although it does not completely eliminate postoperative adverse events.

The reconstructive indications for the pectoralis major flap must be carefully weighed against its inherent limitations. Its principal disadvantages include excessive flap bulk in obese patients, the potential to obscure the detection of deep cervical recurrence, breast asymmetry in female patients, transfer of hair-bearing skin in male patients when used for intraoral reconstruction, and donor-site functional morbidity affecting the shoulder. Nevertheless, when the primary reconstructive objective is not the refinement afforded by microvascular free tissue transfer but rather the rapid, reliable, and well-vascularized coverage of a complex cervical defect, the pectoralis major flap offers a highly favorable risk–benefit profile. Contemporary series evaluating bipaddle and bilobed variants, including reports published in specialized reconstructive surgery journals,

continue to demonstrate the clinical value of the pectoralis major myocutaneous flap (PMMC) for the reconstruction of extensive composite defects requiring both cutaneous coverage and soft-tissue bulk. These studies support its role not only as a salvage procedure but also as a well-planned primary reconstructive option in appropriately selected patients.

VI. INTERPRETATION OF THE CLINICAL CASE

The present case clearly illustrates the intersection between ablative oncologic surgery and regional reconstructive surgery. The patient was a 62-year-old woman with a high-grade malignant neoplasm of the left parotid gland, accompanied by cervical lymphadenopathy and radiologic evidence of aggressive locoregional disease. These findings were confirmed intraoperatively by tumor involvement of the facial nerve, internal jugular vein, and sternocleidomastoid muscle. Following definitive oncologic resection—consisting of total parotidectomy and modified radical neck dissection—the primary surgical challenge shifted from tumor extirpation to the restoration of reliable soft-tissue coverage for an approximately 12 × 8 cm cervicofacial defect. In this setting, the reconstructive strategy was not merely appropriate but anatomically, oncologically, and strategically well justified.

In a patient undergoing extensive resection of the parotid and cervical compartments, the pectoralis major myocutaneous flap provides precisely the reconstructive elements required by the defect: abundant well-vascularized tissue, a skin paddle for external coverage, muscle bulk to obliterate dead space, and durable protection of exposed neurovascular structures. Its close anatomical proximity to the cervical region allows immediate transfer without the need for microvascular anastomosis, thereby reducing operative time, eliminating dependence on recipient vessels within a previously dissected neck, and providing a robust reconstructive platform capable of tolerating subsequent adjuvant radiotherapy. In other words, the pectoralis major flap is not simply an available reconstructive option; it represents a particularly appropriate solution for reconstruction of the high-risk oncologic neck.

From a critical perspective, the value of the pectoralis major flap in this setting is threefold. First, it provides immediate soft-tissue coverage, thereby preventing secondary exposure of the major cervical vascular axis. Second, it restores sufficient tissue bulk to partially correct the cervicofacial contour deformity that inevitably follows extensive parotid resection. Third, it facilitates uninterrupted oncologic treatment by minimizing delays related to wound-edge necrosis, salivary fistula secondary to wound dehiscence, or exposure of major cervical vessels. In patients with high-grade malignancies, for whom adjuvant therapy constitutes an integral component of locoregional disease control, this reconstructive stability may confer an

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indirect prognostic benefit by enabling the timely initiation of postoperative treatment.

The favorable postoperative course observed in the present case—characterized by successful soft-tissue coverage, restoration of regional contour, and protection of exposed cervical structures—reinforces an important principle worthy of emphasis. Pedicled regional flap reconstruction does not invariably compete with microvascular free tissue transfer; rather, in selected clinical scenarios, it may represent the more appropriate reconstructive strategy. For extensive lateral cervicofacial defects following radical oncologic resection, the pectoralis major myocutaneous flap remains a highly relevant reconstructive option, particularly when the primary objectives are oncologic safety, vascular reliability, and immediate protection of critical cervical structures.

This case highlights the importance of multidisciplinary planning between the oncologic surgery and plastic and reconstructive surgery teams. The pectoralis major myocutaneous flap remains a valuable and effective reconstructive option for complex cervicofacial defects following extensive oncologic resections, particularly when robust, well-vascularized tissue is required to withstand adjuvant therapies such as radiotherapy.

CONCLUSIONS

Parotid gland carcinoma is an uncommon malignancy, yet it poses considerable diagnostic and therapeutic challenges because of its marked histological heterogeneity, variable biological behavior, and intimate relationship with critical cervicofacial anatomical structures. The presence of the facial nerve within the glandular parenchyma, the intraparotid lymph nodes, and the close proximity of the gland to the sternocleidomastoid muscle, parapharyngeal space, and major cervical vessels necessitate meticulous surgical planning and a multidisciplinary approach in patients with locally advanced disease. In this context, histologic grade, tumor size, extraglandular extension, neural and vascular involvement, and the presence of regional nodal metastases are key determinants of the extent of surgical resection and overall oncologic prognosis.

Clinical evaluation should be complemented by cytopathologic and imaging studies to accurately define the nature and extent of the lesion. Contrast-enhanced computed tomography plays a pivotal role in the assessment of advanced parotid tumors, as it enables evaluation of the tumor's relationship to adjacent muscular planes, major vascular structures, osseous components, and cervical lymph node levels, while simultaneously facilitating thoracic staging to exclude distant metastatic disease. Although magnetic resonance imaging provides superior characterization of soft-tissue involvement and perineural spread, computed tomography offers indispensable anatomical information for anticipating the complexity of surgical resection, determining the need for cervical lymph

node dissection, and planning the reconstructive strategy based on the expected postoperative defect.

Surgical management should be individualized according to the biological and anatomical characteristics of the tumor. Partial or superficial parotidectomy may be reserved for small, superficially located, low-grade neoplasms, provided that adequate oncologic margins can be achieved. In contrast, high-grade, bulky tumors or those involving the deep lobe generally require subtotal or total parotidectomy. Preservation of the facial nerve should be pursued whenever preoperative nerve function is intact and a tumor-free dissection plane can be established. However, gross tumor infiltration of the facial nerve constitutes a clear indication for resection of the involved nerve segment to ensure oncologic adequacy. Likewise, the presence of clinically or radiologically evident cervical lymph node metastases warrants therapeutic neck dissection, whereas elective neck treatment should be considered for patients with high-grade tumors or T3–T4 disease because of the substantial risk of occult nodal metastasis.

Extensive oncologic resections involving the parotid and cervical regions may result in complex defects characterized by the loss of skin, muscle, and subcutaneous tissue, as well as exposure of critical neurovascular structures. Under these circumstances, immediate reconstruction should not be regarded merely as a means of achieving wound closure but as an essential component of comprehensive oncologic management. Its objectives are to provide well-vascularized tissue, obliterate dead space, protect major cervical vessels, restore cervicofacial soft-tissue volume, and facilitate the timely initiation of adjuvant therapy. Selection of the optimal reconstructive technique should be based on the size and composition of the defect, the patient's overall clinical condition, the availability of suitable recipient vessels, any history of previous radiotherapy, and the expertise of the reconstructive surgical team.

The **pectoralis major myocutaneous flap** remains a reliable and well-established reconstructive option. Its dominant vascular supply from the pectoral branch of the thoracoacromial artery, supplemented by secondary segmental vascular pedicles, accounts for its classification as a **Type V muscle flap according to the Mathes and Nahai classification** and underlies its excellent vascular reliability. Owing to its close anatomical proximity to the head and neck, it enables transfer of a substantial volume of well-vascularized muscle and skin to cervicofacial defects without the need for microvascular anastomosis. Careful preoperative planning of the skin paddle, inclusion of an adequate muscular cuff beneath the cutaneous island, meticulous identification and preservation of the dominant vascular pedicle, creation of a sufficiently wide cervical tunnel, and avoidance of pedicle torsion or compression are critical technical principles for minimizing the risks of partial flap necrosis, venous congestion, and wound dehiscence.

Pectoralis major flap as a reconstructive alternative for cervical skin defects following oncologic parotid surgery: A Case Report

The management of **locally advanced parotid carcinoma** should integrate radical oncologic resection and immediate reconstruction as inseparable components of a single therapeutic strategy. Although microvascular free flaps have become the first-line reconstructive option in many specialized centers, the **pectoralis major myocutaneous flap** retains well-defined indications and unquestionable strategic value for the reconstruction of extensive defects, in high-risk patients, in previously dissected or vessel-depleted necks, and in clinical situations requiring rapid, reliable reconstruction. When appropriately selected and meticulously executed, this flap provides durable soft-tissue coverage, protects critical cervical neurovascular structures, and facilitates the uninterrupted delivery of comprehensive oncologic treatment.

AUTHOR CONTRIBUTIONS

José David Rodríguez Enríquez: conceptualization, project administration, supervision, writing – original draft, writing – review and editing. **Guillermo Tapiá-Barragán:** formal analysis, resources, software, writing – review and editing. **Paul Alejandro Palacios-Zaragoza:** investigation, methodology, resources. **Rodrigo García-Zarco:** investigation, resources. **Miriam Melina Vargas-Mejía:** investigation, resources. **Irad Antonio Zúñiga-Salazar:** investigation, resources. **Miranda Valeria Valdez-Espinoza:** investigation, methodology, resources. **José Giovanni Zayagos-González:** investigation, resources. **Andrés Barroso-Ruiz:** investigation, resources. **Marco Rafael de la Vega-Ornelas:** investigation, resources. **Joahnni Raúl Clark Rivera-Padilla:** investigation, resources.

DECLARATION OF CONFLICT OF INTEREST

The author declares that he has no conflict of interest related to this article.

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CONSENT

The patient provided written informed consent for the publication of this case report and any related images.

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