The Pectoralis Major Myocutaneous Flap for Reconstruction of Soft-Tissue Oncologic Defects

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The pectoralis major myocutaneous flap is probably the most versatile and effective soft-tissue reconstructive technique in the armamentarium of the oral and maxillofacial surgeon treating the patient with malignant pathology. This soft-tissue transfer can contribute a large bulk of well-vascularized muscle and a skin paddle of diverse orientation that can be used for oral lining or as a facial cover tissue for the oral cavity and lower third of the face. The pectoralis major myocutaneous flap was originally described and used for the reconstruction of chest wall defects. In 1968 Hueston and McConchie reported the reconstruction of an upper sternal defect with the pectoralis muscle and an overlying skin paddle. In 1977 Brown and co-workers reported the use of bilateral pectoralis major island flaps for the reconstruction of a midline upper chest and lower neck defect. The muscle was completely isolated on its neurovascular pedicle following the transection of all of its bony origins and insertion, and a skin graft was used for coverage.

In 1979 Ariyan introduced the use of the pectoralis major myocutaneous flap for reconstruction of extirpative defects of the head and neck. This development was of great importance, because it enabled the single-stage transfer of a large bulk of well-vascularized muscle and skin for a wide variety of ablative and traumatic defects of the oral cavity, face, and skull base. Previously, the majority of oral and maxillofacial soft-tissue reconstruction was carried out by placing skin-subcutaneous flaps, such as the deltopectoral flap, a random pattern flap based on perforating vessels from the internal thoracic artery. Axial pattern myocutaneous flaps represented by the pectoralis major flap have now replaced skin-subcutaneous flaps because of their greater arc of rotation, greater predictability, and improved functional and morphologic results, and their ability to place vascular and cellular tissue into a recipient tissue bed that is better able to support bony reconstruction.

Other advantages of the pectoralis major myocutaneous flap
in comparison with the previously used deltopectoral flap include the ability to transfer two epithelial surfaces for intraoral lining and facial cover tissue, the ability to close the donor site primarily, and the ability to perform a single-staged transfer of soft tissue with insetting at the time of flap development rather than on a delayed basis.

SURGICAL ANATOMY

The pectoralis major muscle is a broad, flat, fan-shaped muscle that covers much of the anterior thoracic wall. It covers the pectoralis minor, subclavius, serratus anterior, and intercostal muscles. The pectoralis major muscle arises from the medial one half to two thirds of the clavicle, the lateral portion of the entire sternum and the adjacent cartilages of the first six ribs, and the bony portions of the fourth, fifth, and sixth ribs. Three major segmental subunits are described, each with its own vascular and motor nerve supply: a cephalad or clavicular segment, a sternocostal segment, and a laterally placed external segment\textsuperscript{15,23} (Fig. 1). The cephalad segment arises from the clavicle; the central or sternocostal segment arises from the sternum and ribs; and the laterally placed external segment arises from the bony portion of the fourth, fifth, and sixth ribs as well as the rectus abdominus and external abdominal oblique aponeurosis.

\begin{figure}[h]
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\caption{The pectoralis major muscle and its three segmental sub-units: the cephalad or clavicular segment, the sternocostal segment, and the laterally placed external segment.}
\end{figure}
The dominant blood supply to the pectoralis major myocutaneous flap is the pectoral branch of the thoracoacromial artery which arises from the first or second branch of the axillary artery. The pectoral branch of the thoracoacromial artery courses inferiorly and medially on the inferior surface of the muscle along the vascular axis as described by Ariyan. This axis is formed by connecting the acromion and the xiphoid process. The pectoral branch of the thoracoacromial artery enters the muscle perpendicular to the midportion of the clavicle and continues in this fashion until reaching the vascular axis, at which point it abruptly changes its course to an inferomedial direction along the axis. The clavicular segment receives its blood supply from the deltoid branch of the thoracoacromial artery and is innervated by branches of the lateral pectoral nerve. The lateral pectoral nerve is so named because it is a branch of the lateral cord of the brachial plexus, even though it is commonly located medial to the medial pectoral nerve on the anterior chest wall. The sternocostal segment accounts for the majority of the pectoralis major muscle mass and receives its blood supply from the pectoral branch of the thoracoacromial artery. This segment receives motor innervation from both the lateral pectoral nerve and the medial pectoral nerve. The external segment of the pectoralis major muscle is found laterally and is commonly fused with the sternocostal segment, although it may present as a distinct slip lateral or dorsal to the sternocostal segment at its lateral inferior edge. The external segment is innervated by branches of the medial pectoral nerve and has a variable blood supply, with the lateral thoracic artery, a branch of the second division of the axillary artery, as the exclusive source in approximately 50% of cases. In 20% of cases, the external segment is supplied by branches of the pectoral branch of the thoracoacromial artery. In the remaining 30% of cases, this segment is supplied by a combination of the lateral thoracic artery and thoracoacromial artery. The pectoralis major muscle is additionally contributed to by intercostal perforators from the internal thoracic artery medially and the superior thoracic artery superomedially.

The action of the pectoralis major muscle is to adduct and medially rotate the humerus. The muscle is active in internal rotation of the arm only when resistance is applied to arm motion. The upper muscle fibers assist in flexing the arm to the horizontal level; the lower fibers assist in arm extension. Loss of function of the pectoralis major muscle seems to be well-tolerated, with much of the adductor activity compensated for by the latissimus dorsi muscle.

**SURGICAL TECHNIQUE**

Ideally, development of the pectoralis major myocutaneous flap is started after the recipient tissue bed is completely developed. This permits the design of a skin paddle with the identical dimensions of the mucosal excision in the specimen. If the flap is developed before or simultaneously with ablative tumor surgery, an inadequate skin paddle may be placed in the recipient bed. Once the ablative cancer surgery has been completed, all specimens for frozen section have been studied by the pathologist, and the reconstruction bone plate has been placed, the skin paddle is designed on the chest wall with a skin-marking pen (Fig. 2). The skin paddle is located inferior and medial to the nipple, a configuration which results in the least amount of cosmetic deformity of the chest wall. An assessment of the ratio of chest wall length to neck length dictates to what extent the skin paddle must be placed inferior to the nipple. When the vertical distance from the nipple to the clavicle exceeds the vertical distance from the clavicle to the recipient bed, a favorable arc of rotation can be anticipated, in which case the skin paddle can be designed slightly inferior to the nipple. If, however, the patient's chest wall is shorter than the neck, the skin paddle must be designed further inferior to the nipple, with less of the skin paddle supported by underlying pectoralis major muscle. Clinical experience demonstrates that the previously described skin paddles can remain completely viable under such circumstances.
Figure 2. A skin paddle is designed inferior and medial to the nipple with the exact dimensions of the soft tissue defect in the oral and maxillofacial region. A curvilinear incision is demarcated with the skin marking pen, extending from the medial aspect of the skin paddle towards the insertion of the muscle at the humerus.
Access to the muscle is provided by a single curvilinear incision beginning at the medial extent of the designed skin paddle and extending superolaterally toward the insertion of the muscle at the greater tubercle of the humerus. The incision is made through skin with a scalpel. Subsequent dissection is usually performed with the electrocautery unit so as to reduce bleeding. At this point the anesthesiologist should administer a nondepolarizing neuromuscular blocking agent which eliminates the undesirable jumping of the muscle as the electrocautery unit approaches the pectoralis major muscle. The dissection is carried completely through the subcutaneous fat to the level of the pectoralis fascia on the ventral surface of the muscle. The lateral skin flap is undermined at this level to the insertion of the muscle superiorly and the free lateral margin of the muscle inferiorly (Fig. 3). The medial skin flap is undermined superficial to the pectoralis fascia until the lateral sternum is palpated. Inferiorly, care must be taken not to undermine the designed skin paddle off the underlying muscle. Suturing the superior margin of the skin paddle to the underlying muscle fascia avoids shearing forces on the paddle during the dissection which might lead to partial or total skin paddle necrosis. Inferiorly, the skin paddle margin is sutured to either the underlying rectus abdominus muscle fascia or the pectoralis major muscle fascia.

**Figure 3.** Initial dissection of the flap proceeds superficial to the pectoralis fascia on the ventral surface of the muscle. The skin paddle is sutured to the fascia to prevent shearing forces that would compromise its blood supply.
After the skin paddle has been delineated and sutured to the muscle fascia, elevation of the myocutaneous flap is started inferiorly. An incision is made horizontally through the rectus fascia 1 to 2 cm below the skin paddle. The electrocautery unit is used to dissect superiorly in a plane superficial to the rectus muscle and deep to its fascia, which is continuous with the pectoralis fascia on the dorsal surface of the muscle. Superiorty, the dissection proceeds between the pectoralis fascia and the fascia of the intercostal muscles. As the pectoralis major muscle is elevated off the ribs, it is taken down to the periosteum and perichondrium. As the flap elevation proceeds superiorly, the surgeon will frequently shift the dissection from medial-to-lateral to avoid splitting the muscle. The dissection is actually facilitated by use of the electrocautery unit as the bony origins of the muscle contract away from the ribs. Medially, the intercostal spaces are perforated by vessels from the internal thoracic artery and vein, and use of the electrocautery unit permits coagulation of the vessels as they are encountered. The muscle is separated from the lateral aspect of the sternum medially and elevated laterally with ease as the free margin of the pectoralis major muscle is located.

As the dissection proceeds superior to the fourth rib, the pectoralis fascia becomes more defined, and a loose areolar layer becomes evident between the pectoralis major and pectoralis minor muscles. The pectoralis minor muscle is considerably shorter vertically than the pectoralis major and originates from the second, third, and fourth ribs and inserts on the coracoid process of the scapula. Once the loose areolar layer is identified, the dissection is continued using Metzenbaum scissors so as to avoid trauma to the vascular pedicle of the pectoralis major muscle which begins to come into view on its undersurface. As the dissection continues superiorly, multiple branching vessels can be seen within the deep surface of the pectoralis major muscle. These represent the pectoral branch of the thoracoacromial artery centrally, the lateral thoracic artery laterally, and the superior thoracic artery medially (Fig. 4A).

The medial portion of the muscle is dissected free of the sternum to the level of the clavicle. The arc of rotation of the myocutaneous flap may be tested at this time; however, the insertion of the muscle at the humerus frequently prohibits effective rotation of the myocutaneous flap into the recipient tissue bed. As such, disinsertion of the flap is commonly necessary. This is accomplished by bluntly dissecting through the muscle in layers with a Kelly hemostat. Frequently, the cephalic vein is visualized between the deltoïd and pectoralis major muscles. A complete disinsertion of the muscle gives an acceptable arc of rotation of the flap into the maxillofacial region (Fig. 4B). If not, further release of some of the attachments to the clavicle will result in further rotation.
Figure 4. A Elevation of the myocutaneous flap allows for visualization of the three pedicles running axially on the undersurface of the muscle. B, Disinsertion of the muscle (arrow) allows for an effective arc of rotation of the flap into the recipient tissue bed.
A bipedicled tunnel is then created in the neck to permit passage of the flap into the maxillofacial region. This tunnel is created superficial to the sternocleidomastoid muscle and clavicle and deep to the platysma muscle. In most cases, the external jugular vein is encountered and must be ligated to complete the tunnel. The bipedicled neck tunnel must be wide enough to accommodate the flap without compression, which would create venous congestion or arterial compromise in the flap. The tunnel is usually wide enough if four fingers can be placed in its mediolateral width. During the transfer of the flap through the tunnel, care is taken to avoid shear stress on the skin paddle. An assessment of color and capillary refill should be made before and after passage of the skin paddle in the neck. At this stage, the flap "equilibrates" in the neck before placement in the oral cavity.

The previously placed sutures in the skin paddle margins are removed before suturing the skin paddle to the surrounding oral mucosa. One of the more controversial aspects of flap placement involves its orientation about the bone plate. Two options exist—placing the muscle portion of the flap lateral to the plate or medial to the plate (Fig. 5). If a quantitatively deficient skin flap is permitted to drape over the bone plate, some patients will experience dehiscence of the skin following the administration of radiotherapy.

**Figure 5.** A. One option for orientation of the muscle is lateral to the reconstruction bone plate. This works well for symphyses and anterior defects to prevent future plate exposure.

*Illustration continued on opposite page*
Figure 5 (Continued). B. The other option involves routing the muscle medially to the plate, which is suited for defects in the mandibular body area. The muscle is sutured to the holes in the plate to obliterate dead space.
The rationale for placement of the flap lateral to the bone plate is to provide well-vascularized tissue over the plate to prevent this complication. This orientation is not without concern, however, as compression of the muscle on the bone plate may create venous congestion and lead to partial or total skin paddle necrosis. The solution to this problem is to place the muscle medial to the plate where less compression is placed on the pedicle. The clinical experience of the authors indicates that the flaps should be placed medial to reconstruction bone plates that bridge continuity defects of the mandibular body region and lateral to plates that bridge continuity defects of the symphysis of the mandible. Surgical management of cancer in the mandibular symphysis region requires that the suprahypoid musculature be reattached to the reconstruction bone plate so as to preserve the posterior airway by suspending an otherwise flail tongue (Fig. 6). In the authors' hands, this simple maneuver frequently eliminates the need to perform a tracheostomy. Placement of the flap lateral to the reconstruction bone plate is most desirable because it does not interfere with the resuspension of the suprahypoid muscles. Placement of a pectoralis flap medial to the plate would interfere with accurate suprahypoid suspension, possibly necessitating tracheostomy. Following positioning of the flap pedicle, all dead space surrounding the reconstruction plate is closed by suturing the flap to the holes in the plate, taking care to avoid perforation of the vascular pedicle. The skin paddle is sutured to the surrounding oral mucosa (Fig. 7).

Figure 6. Resuspension of the suprahypoid and extrinsic tongue musculature to the reconstruction bone plate obviates the need for a tracheostomy in this case.
Figure 7. The muscle is passed lateral to the reconstruction bone plate and the skin paddle is sutured to the oral mucosa.
Before closure of the chest wall, meticulous hemostasis must be achieved. Two suction drains are placed in the donor site, one lying horizontally and dependently in the inferior aspect of the defect and the other placed vertically and laterally in the defect (Fig. 8). It is not uncommon for the drains to collect 100 to 200 mL of fluid per day for the first 2 to 3 days postoperatively. Because of the extensive undermining with elevation of most of the pectoralis major muscle, primary closure of the donor site is almost always accomplished, even when very large skin paddles are developed. Use of the pectoralis major myocutaneous flap does not result in significant cosmetic deformity at either the donor or recipient site (Fig. 9). Postoperative evaluation of patients who have undergone pectoralis major flap surgery indicates that maintenance of the motor innervation to the muscle preserves its skeletal muscle anatomy both macroscopically and microscopically (Figs. 10 and 11). This is at least conceptually important, as it translates to preservation of the enhanced blood supply to the recipient bed, which is one of the reasons for performing flap surgery.

Figure 8. Two drains are placed in the donor site and an anatomic closure is performed.
Figure 9. One year postoperative, appearance of the chest of a patient reconstructed with a pectoralis major myocutaneous flap and reconstruction plate. The chest wall anatomy is essentially unaltered, including good position of the ipsilateral nipple.

Figure 10. Maintenance of the motor innervation to the pectoralis major muscle is appreciated when the patient adducts his left arm and medially rotates his left humerus, thereby causing flexion of the muscle in the neck. Occasionally, patients request removal of this muscle bulk.
Figure 11. Maintenance of the motor innervation to the flap also preserves its microscopic muscular anatomy.
Figures 12 and 13 show the final postoperative appearance of a patient 1 year following pectoralis flap and reconstruction plate placement for a composite resection of a floor of mouth malignancy. Acceptable restoration of facial form, symmetry, and mandibular projection are evident.

Figure 12. A, Facial appearance prior to composite resection, reconstruction plate, and pectoralis flap reconstruction. B, Postoperative facial symmetry is acceptable.
Figure 13. A, Preoperative profile. B, Postoperative profile. Mandibular projection and lip competence are preserved.
DISCUSSION

The pectoralis major myocutaneous flap is a reliable and useful transfer of well-vascularized soft tissue for reconstruction of extirpative defects of the oral cavity and face. The technique for the development of this flap is straightforward, and predictable results may be obtained when the scientific principles of myocutaneous flap surgery are followed. Sufficient evidence substantiates the numerous indications, diverse applicability, and great versatility of this soft-tissue flap. The applicability of this flap in reconstructive surgery of the head and neck is now universally accepted, and it has proven to be a definite advance over previously employed methods. Unfortunately, larger numbers of reported cases in the literature have been associated with an increasing number and type of complications. 5, 10, 14, 16, 17, 21, 22.

Shah and co-workers 22 have retrospectively reviewed the records of 211 patients undergoing the pectoralis major myocutaneous flap. The flap was used for mucosal lining of the oral cavity or oropharynx in 109 patients, for pharyngoesophageal reconstruction in 44 patients, for skin coverage in 47 patients, and for reconstruction of other anatomic locations in 14 patients. Flap-related complications occurred in 63% of patients. Several patients experienced more than one complication. Sixty-nine patients (32%) had varying degrees of flap necrosis. Of these, 7 (3%) sustained total flap necrosis and 62 (29%) partial flap necrosis. Other complications included fistula formation in 61 patients (29%), dehiscence in 56 (26%), infection in 51 (24%), and hematoma in 14 (7%). This report is particularly valuable because it offers an explanation of the etiology of the complications rather than merely tabulating and describing their type. In particular, one patient was a heavy smoker with a history of severe peripheral vascular disease. In an analysis of the risk factors for the development of flap complications, Shah and colleagues showed the following factors to be significant: age over 70 years, female gender, albumin level of less than 4 g/dL, nomographic overweight, use of the flap in reconstruction of the oral cavity after major glossectomy, and the presence of other systemic diseases.

Schusterman and co-workers 21 have reviewed their experience with 126 patients who underwent soft-tissue reconstruction with the pectoralis major myocutaneous flap. The complications related to the pectoralis major myocutaneous flap were compared with those related to the radial forearm microvascular flap. A total of 72 (57%) of the patients undergoing pectoralis major flap surgery sustained complications. These were similar in type to those reported by Shah and colleagues and included dehiscence, fistula formation, infection, hematoma, and flap loss. Specifically, dehiscence was noted in 31 patients (25%), fistula formation in 30 (24%), infection in 15 (12%), hematoma in 8 (6%), and flap loss in 18 (14%). The patients undergoing the pectoralis major myocutaneous flap had significantly higher rates of overall complications than the patients undergoing the radial forearm free flap.

Ossoff and co-workers 17 reviewed the complications related to the placement of 95 pectoralis major myocutaneous flaps in 86 patients. Their study introduces the concern of “hidden recurrences” in patients undergoing this soft-tissue reconstructive technique. The problem of delayed detection of recurrence in the neck in at-risk patients following extirpative cancer surgery is an important concern and may be unique to myocutaneous flaps. 4, 20 With longer follow-up of the patients in Ossoff’s series, three cases of hidden recurrence were noted. These recurrent tumors were not detected as quickly as they would have been in patients who had not undergone pectoralis major myocutaneous flap reconstruction. The muscle portion of the flap covers structures in the neck that may contain occult disease that is not removed at the time of the cancer surgery. Postoperative palpation of the neck is therefore obstructed, and recurrences are not detected expeditiously.
The most annoying and frustrating complication for surgeons performing myocutaneous flap surgery is partial or total skin paddle necrosis. This complication defeats the primary purpose of development of the flap, which is reconstruction of a soft-tissue defect with the skin paddle. Loss of part or all of the skin paddle or of the entire myocutaneous flap requires that the surgeon perform additional surgery to salvage the reconstruction. All of the complications that occur related to myocutaneous flap surgery are reversible with the exception of partial or total flap necrosis. Once a portion or all of the flap becomes necrotic, resuoration of the dead flap is impossible even with hyperbaric oxygen or other adjunctive therapy. On the other hand, postoperative hematoma and infections may be evacuated and drained to complete resolution, and dehiscence may be packed with ultimate healing as well.

Complications and adverse sequelae are inevitable after any surgical procedure. The definition of what constitutes complication is variable in the literature. The entities that should be included as complications and how they should be quantified are important information to consider when discussing the shortcomings of any surgical procedure. Moreover, the morbidity and long-term impact of complications must be pondered carefully in an effort to ascertain their true etiology. This permits the identification of high-risk groups and technical difficulties which assists in preoperative evaluation and the appropriate selection of a reconstructive method to prevent or reduce the rate of complications. These statements are particularly true in regards to the development of the pectoralis major myocutaneous flap. A careful review of the technique originally described for the development of this flap as well as of the complications described by the surgeons who use the technique provides useful information in determining why one particular complication might occur.

In 1979, Ariyan presented a landmark study outlining his technique and experiences with the pectoralis major myocutaneous flap for the reconstruction of extirpative soft-tissue defects of the head and neck region. His original technique involved the harvest of a strip of muscle surrounding only the pectoral branch of the thoracoacromial artery, with a skin paddle of diverse orientation located predominantly superomedial to the nipple. This has often been referred to as the “strip technique” (Fig. 14A). During the dissection, branches of the thoracoacromial artery extending medially and laterally are sacrificed. The pectoral branch of the thoracoacromial artery branches early, and therefore major axial vessels are likely to be transected in developing the flap with only a strip of muscle. Perhaps more concerning is the fact that any contribution from the lateral thoracic artery and superior thoracic artery is eliminated when using this approach. Because Ariyan reported no skin paddle necrosis in his original cases, questions remain as to whether the superior thoracic and lateral thoracic pedicles represent important contributions to the vascularity of the flap, and whether these pedicles should be included in the flap (Fig. 14B).
Figure 14. A. The original technique for development of the pectoralis major myocutaneous flap is illustrated. In this technique, only a small strip of muscle is incorporated in the flap. B. To avoid avascular necrosis, it would seem prudent to include all three pedicles in the flap to ensure flap viability.
In an effort to answer these questions, several studies of the vascular anatomy of the pectoralis major muscle have been performed. Moloy and Gonzales\textsuperscript{15} noted that four vascular pedicles nourish the pectoralis major muscle. Two of these pedicles, the intercostal and superior thoracic, are divided when raising the flap according to their specific technique. The two remaining pedicles are the lateral thoracic artery and the pectoral branch of the thoracoacromial artery. The pectoral branch of the thoracoacromial artery has been considered to be the dominant pedicle to the muscle, and the potential importance of the lateral thoracic artery has been largely underestimated.\textsuperscript{12} Moloy and Gonzales\textsuperscript{15} performed a survey of the arterial supply to the pectoralis major muscle by studying the findings of dissection of the axillary artery in 20 cadavers and reviewing 10 aortic arch angiograms in living patients. Thirty-five axillae in the cadaveric specimens were sufficiently well-preserved to permit detailed dissection. The most common anatomic pattern in the living patients (present in seven cases) consisted of separate origins for the lateral thoracic artery and thoracoacromial artery from the axillary artery. Anatomic dissection of the cadaveric specimens revealed this pattern of separate origins in 32 of the 35 specimens. The lateral thoracic artery and pectoral branch of the thoracoacromial artery were of equal caliber in 24 of the specimens, whereas in the remaining eight specimens, the lateral thoracic artery was of greater diameter than the pectoral branch of the thoracoacromial artery. In no instance was the lateral thoracic artery smaller than the pectoral branch of the thoracoacromial artery. Freeman and co-workers\textsuperscript{9} performed similar studies in cadaveric specimens and found that both pedicles communicate with each other via multiple anastomosing branches. It was concluded that the lateral thoracic artery contributes significantly to the vascularity of the pectoralis major muscle and should be included in the myocutaneous flap to enhance viability.

The technique described herein for harvesting the pectoralis major myocutaneous flap includes nearly the entire muscle with all three of its axial pedicles as well as the proximal branches of each of their interconnecting vessels. Such a complete blood supply provides a greater perfusion to the most distal portions of the muscle and to the skin paddle which occasionally may be located partially off of the distal most portion of the muscle inferior to the nipple. This complete blood supply allows a more reliable soft-tissue transfer with enhanced viability and a longer arc of rotation of the myocutaneous flap. A skin paddle which extends off the distal most aspect of the pectoralis major muscle and onto the rectus sheath is probably not directly perfused by either of the three pedicles to the muscle. Instead, the inferior and medial skin territories are probably perfused by branches of the internal thoracic and superior epigastric artery perforators.\textsuperscript{19} These vessels have anastomotic connections with the pectoral branches of the thoracoacromial artery, the lateral thoracic artery, and the superior thoracic artery at the level of the dermal and subdermal plexus.\textsuperscript{19} This portion of the skin paddle after any pectoralis major flap elevation is supplied by the dermal and subdermal plexus originally from the internal thoracic and superior epigastric arteries that are now captured and supplied via their anastomotic connections with the pectoral branches of the thoracoacromial, lateral thoracic, and superior thoracic arteries within the pectoralis major muscle.\textsuperscript{19} The skin paddle therefore remains partially axial and becomes random, dependent on a trickle effect from capillary-arteriolar connections as well. Current data on the vascular anatomy of the pectoralis major muscle support the inclusion of as large a vascular pedicle as possible when developing this myocutaneous flap. In fact, many of the complications described by numerous investigators may be explained by the fact that their flaps were based only on the pectoral branch of the thoracoacromial artery.
CONCLUSION

The pectoralis major myocutaneous flap is an important adjunct to oncologic surgery performed by the oral and maxillofacial surgeon. This flap can provide sufficient transfer of muscle and skin for the soft-tissue reconstruction of 90% of exquisitive defects. The approaches to flap development discussed and illustrated in this article are based on the known vascular supply to this donor site as well as sound principles of flap rotation. Adhering to these principles results in a predictable soft-tissue transfer with little morbidity and few complications.

References


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