Chapter 82 – Regional Pedicle Flaps

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The use of pedicle flaps has significantly improved the safety and functional outcomes of head and neck surgery. The reliability and ready availability of pedicle flaps make them the most commonly used means of reconstructing defects created in the course of extirpative surgery. Because of the aggressiveness of today's chemotherapy and radiation therapy protocols, the ability to bring oxygenated tissue with a nourishing blood supply to the surgical defect has been critical. Moreover, many of these flaps can be created and transferred without needing to reposition the patient intraoperatively. They do not require microvascular expertise, along with the painstaking time spent under the microscope, nor do they tend to significantly increase the duration of the operative procedure. This chapter presents an overview of the relevant anatomy, steps for technical execution, and common complications of pedicled flaps for the head and neck.

Several excellent general references and atlases have been prepared to assist surgeons contemplating head and neck reconstruction with regional flaps. Three excellent sources are listed at the beginning of the reference section.[1–3]

PECTORALIS MAJOR FLAP

The pectoralis major flap is the most commonly used muscle or myocutaneous flap worldwide in head and neck surgery and certainly one of the most reliable of all the pedicle flaps.[4–7] It has a long tradition of use in reconstruction of the oral cavity and oropharynx and can be used with a cutaneous island or as a myofascial flap alone (Fig. 82-1). Its ability to protect the great vessels of the neck is literally a lifesaving attribute.

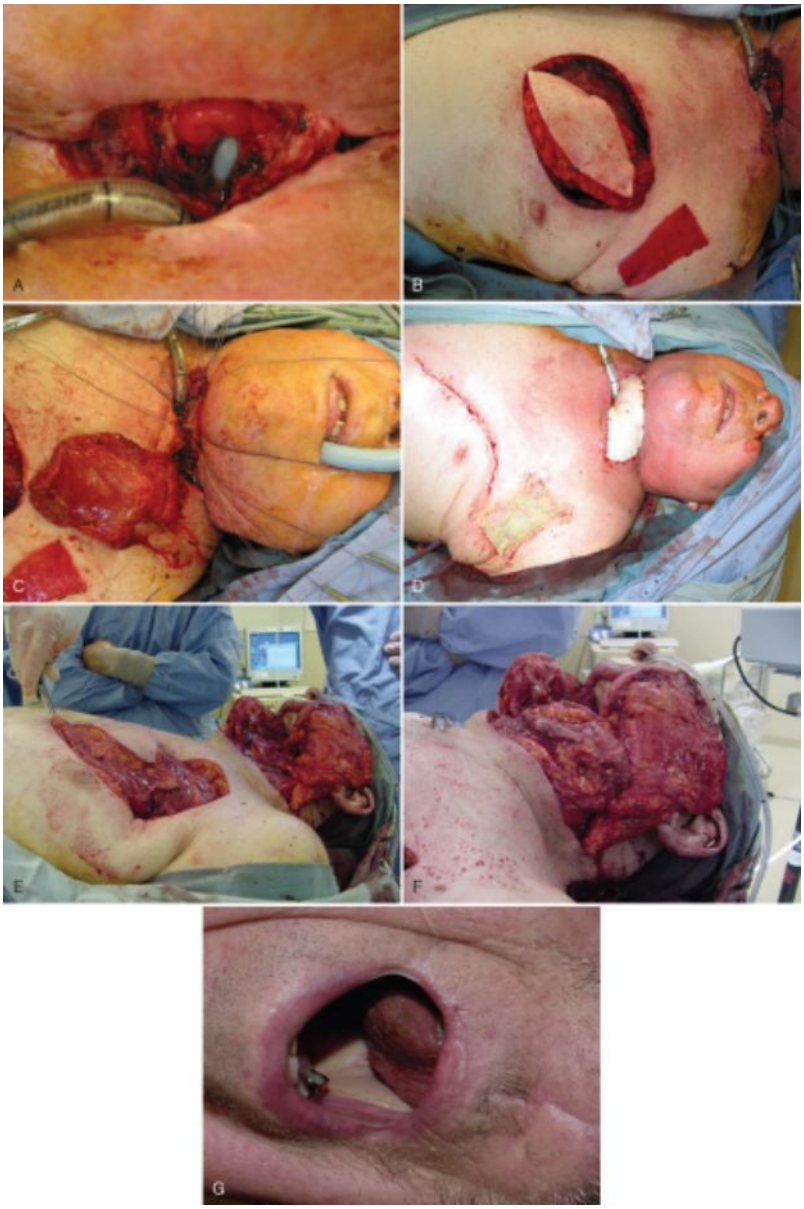

Figure 82-1 Pectoralis myocutaneous flap. **A,** Defect for a pectoralis myocutaneous flap. **B,** Incision for flap elevation. **C,** Pectoralis flap ready for coverage of the defect. **D,** Pectoralis myocutaneous flap in place. **E,** Pectoralis flap for closure of the oral cavity. **F,** Flap in place. **G,** Pectoralis myocutaneous flap lining the oral cavity in another patient.

The pectoralis major muscle provides the bulk of the flap and is nourished by the pectoral branches of the thoracoacromial artery. The thoracoacromial artery branches from the subclavian artery deep to the clavicle and enters the underside of the pectoralis major muscle at about the midpoint of the clavicle. One can draw the course of the thoracoacromial artery on the skin of the chest by marking the clavicle at its midpoint. If one draws a line from the xyphoid to the acromion and constructs a perpendicular to this line that meets the midpoint of the clavicle, the artery's course corresponds to the vertical perpendicular and the medial portion of the line from xyphoid to acromion. When elevating the pectoralis major, the artery can be seen running in fat on the underside of the muscle.

Additionally, the lateral thoracic artery enters the lateral portion of the sternal head of the pectoralis major muscle but is routinely sacrificed during harvest to maximize the arc of rotation of the flap. Usually, this will not compromise flap viability, but a wary surgeon is advised to inspect the course of the thoracoacromial first. Some authors have reported that perhaps one in seven patients has a sternal portion of the muscle served predominantly by a branch of the lateral thoracic artery.

The skin overlying the medial aspect of the pectoralis major muscle is nourished by perforators from the internal mammary artery, especially those arising from rib interspaces 2, 3, and 4, with perforators from interspaces 3 and 4 playing particularly prominent roles. These perforators are the arterial input for the classic deltopectoral flap.

The origin of the pectoralis major is divided into three segments: clavicular, sternocostal, and the aponeurosis of

the external oblique. The clavicular origin arises from the medial third of the clavicle. The sternocostal origin arises from the sternum and the first six ribs. The third origin arises from the attachment of the inferior edge of the pectoralis muscle to the aponeurosis and the fascia of the external oblique muscle. The insertion of the pectoralis major runs deep to the deltoid and inserts on the greater tubercle of the humerus. The medial edge of the deltoid and the tendinous insertion of the pectoralis major are almost indistinguishable from one another. The cephalic vein can be used as a guide to differentiate between them. The thoracoacromial artery will run the length of the muscle on its deep surface as described earlier.

The pectoralis muscle mass stretches across the superior anterior aspect of the chest, where it acts to abduct and medially rotate the humerus. Use of the muscle in construction of a flap does not cause significant functional disability. Because of the length available in this flap, the pectoralis major muscle can be used for defects ranging from the lower part of the neck such as a stoma after laryngectomy, the upper part of the neck, the tongue and floor of the mouth, and the lateral head/auricular area.

A skin island is often used to replace mucosa when a pectoralis major myocutaneous flap is positioned in the site of the defect. The skin island is fed by perforators of the thoracoacromial system emerging from the anterior surface of the muscle. If the skin island is extended off the boundaries of the muscle in any direction, the portion of skin extending beyond the muscle will have a random blood supply and can be less reliable. However, the skin island can be placed anywhere on the anterior surface of the muscle that would be usable in filling the defect. This is often approximated during surgery by positioning a towel at the origin of the thoracoacromial artery below the clavicle and extending inferiorly to the inferior edge of the skin island. In this way the arc of rotation and the length of the muscle on its pedicle can be evaluated to ensure adequate advancement.

The incision for liberating the pectoralis major muscle from the overlying skin and the underlying chest wall can be varied, depending on the concerns of the patient and the needs of the reconstructive procedure. Typically, the skin island is positioned near the end of the flap, close to the caudal portion of the muscle origin. It is often possible to dissect out the muscle through an incision in the inframammary fold. If a skin flap is needed, the skin and subcutaneous tissue can be incised to expose the pectoralis muscle, which can then be raised through these incisions around the skin island. The skin island is fed by perforators from the thoracoacromial artery running through the muscle, and thus care must be taken to not undercut or shear the skin island from the muscle. Several stay sutures tacking the skin island to the muscle are helpful toward this end, and the inferior sutures may be left long to help bring the flap up into its final position. The use of long stay sutures wrapped around the surgeon's finger provides traction and flexibility as the surgeon pulls the flap below the neck skin overlying the clavicle. The crucial technical detail to be observed in flap advancement is making the tunnel under the clavicular skin large enough to easily accommodate the bulk of the muscle. Sometimes it will be necessary to incise this skin and place a skin graft over the muscle.

Any area of the skin island directly over the muscle should have a good blood supply. Portions of the skin that extend beyond the pectoralis will be random, and their survivability is less reliable. Flaps may be harvested with one skin island, two as in the case of a bilobed flap, or no skin island at all. Inclusion of rib has been used when osseous reconstruction is needed, although this is much less commonly done today now that experience with osteocutaneous free flaps is so extensive. If the fifth rib is harvested along with the flap, care must be taken to not separate the muscle from the fifth rib because the rib derives its blood supply from perforators running through the muscle to the periosteum over the surface of the rib.

In a female patient, a curvilinear incision inferior to the breast, in the breast crease, can avoid the more obvious scarring that can still be seen with low neck lines when the incision runs on the anterior chest wall. In addition, the fibrofatty breast tissue can easily be elevated away off the muscle as a complete unit when making an incision in the inframammary fold.

As the pectoralis muscle is lifted off the chest wall, it must be divided at its medial origin and lateral insertion. The connection of the muscle to the proximal end of the humerus will ultimately need to be released to allow enough mobility for the flap to fill a defect in the head and neck region. These muscle divisions are best accomplished with electrocautery. Care must be taken to avoid disruption of the feeder vessels on the undersurface of the pectoralis major. The nerve supply to the pectoralis major muscle arises from the lateral (C5 to C7) and medial (C8, T1) pectoral nerves. These nerves are often cut when raising this flap to provide an adequate arc of rotation. This causes some long-term atrophy of the muscle, which is often advantageous in head and neck reconstruction.

The muscle may be released medially from the sternum and laterally at the anterior axillary line near its insertion. It may then be brought over the clavicle, under the supraclavicular skin, and into the defect. Alternatively, the muscle may be divided on either side of the thoracoacromial vascular bundle down to the distal end of the flap, which may be larger and even include a cutaneous portion. This flap is like a lollipop and creates less of a deformity in the neck. However, it does not have the expanse of tissue to cover deep neck structures, including the great vessels, that the wider pectoralis major flap does.

When positioning this flap the operator must be careful to not overly twist, kink, or crimp the vascular pedicle. If the operator's hand can be comfortably placed below the skin of the inferior portion of the neck and supraclavicular area from the neck incision into the chest incision, there is little danger the vascular pedicle will be compromised. Similarly, experimenting with the most natural pattern for the flap to fill the defect can avoid excessive rotation and reduction of the blood supply.

Complications are fortunately relatively infrequent with this flap, and hence it is used frequently in head and neck reconstruction. Full necrosis of the flap is uncommon. Partial necrosis is not uncommon, however, although local wound care is typically sufficient to resolve problems encountered with healing. On occasion, a split-thickness skin graft will need to be used for coverage of a donor site defect. This is preferable to having the chest wound break down later because of a closure that is too tight. The operator must be wary of tension on the donor site closure when a large skin island has been harvested. A skin graft whose appearance bothers the patient can probably be removed later with the technique of serial excision.

Using at least two suction drains helps avoid but cannot absolutely prevent a postoperative hematoma. Particularly if the patient's blood pressure is elevated or if an episode of excessive coughing occurs, a sudden bulge in the donor area may herald a subcutaneous hematoma. Of course, careful hemostasis must be obtained as the flap is harvested to help avoid this complication.

When advanced, the flap can be wrapped around bone or reconstruction plates (or both). A cutaneous paddle can be intraoral, extraoral, or both if a bridge of skin between the paddles is de-epithelialized and buried. The surgeon soon learns that myocutaneous flaps to the head and neck must be suspended adequately to obtain the best results. External cutaneous paddles in particular will invariably settle and appear to hang with time, and patients should be advised of this possibility. Later corrective surgery is frequently possible to achieve a significant measure of improvement.

LATISSIMUS DORSI FLAP

The latissimus dorsi flap remains the most generally dependable and versatile flap in the reconstructive surgery armamentarium.[8–10] It is a broad flat muscle of considerable length. It originates from an aponeurosis that joins the posterior layer of the thoracolumbar fascia from about the sixth thoracic vertebra to the posterior iliac crest. The muscle inserts into the intertubercular groove of the humerus. Its considerable length allows it to easily reach the head and neck area as a pedicled flap (Fig. 82-2). For this purpose it may be tunneled subcutaneously over the pectoralis major, under the pectoralis major insertion fibers and over the lateral aspect of the clavicle, or under the clavicle itself. In the head and neck area the latissimus dorsi flap may be used for surface reconstruction, and it may also be advanced into the oral cavity and even used for esophageal reconstructions. If a skin paddle is required, it is best to base it on the middle of the muscle because the most distal portion at the origin is not reliably well perfused.

Figure 82-2 Latissimus dorsi flap. **A,** Latissimus dorsi donor site incision. **B,** Latissimus flap in place with a skin graft.

The muscle is approached with the patient bumped up to expose the back or in a decubitus position. A transverse incision high in the axilla is extended along the posterior axillary fold to expose the lateral border of the muscle. The dissection separates the overlying back skin and subcutaneous tissue from the posterior aspect of the muscle, except where a cutaneous portion may be required. Electrocautery is used to release the muscle from its origin. The anterior dissection should respect the long thoracic artery to the serratus muscle, where it lies just a centimeter or so behind and under the anterior border of the latissimus muscle. The thoracodorsal artery serves the latissimus muscle. The thoracodorsal neurovascular bundle is relatively large and may easily be traced to its

origin from the subscapular artery. For transposition to the region of the head and neck, painstaking vascular dissection is required so that the muscle can be mobilized on its vascular leash and advanced to above the ear, the maxilla, or across the base of the neck as needed.

As for reconstructions with the pectoralis major muscle, it is essential that the latissimus be supported with multiple sutures so that it does not descend and thereby dehisce the wound or create a sagging flap that is less functional and attractive than when inset in the operating room. Some sagging late is almost always a problem, but early dehiscence must be avoided.

STERNOCLEIDOMASTOID MUSCLE FLAP

The sternocleidomastoid (SCM) flap can be based either from its inferior origin on the sternum and clavicle or from its superior insertion on the mastoid process[11,12] because of the multiple arterial blood supply to the muscle along its course. The principal blood supply to the SCM is via the occipital artery at the superior aspect of the muscle. Further inferiorly along its course the muscle receives blood from the postauricular artery, branches from the superior thyroid artery, and branches from the thyrocervical trunk. A skin island can be incorporated with this flap and derives its blood supply from perforators running through the SCM. Motor neural input to the SCM comes from branches of the spinal accessory nerve. In addition, C2 and C3 supply innervation, with disagreement whether this innervation is motor or sensory in nature.

There is some controversy about using the SCM flap when cervical metastases from an upper aerodigestive tract malignancy are present. Spread down the internal jugular chain lymph nodes can bring the cervical metastases into contact with the SCM, and in this situation a different reconstructive option should be considered. If the SCM must be excised to complete the neck dissection, another flap must obviously be considered.

Evaluation of the arc of rotation that will best allow the flap to fill the defect will determine how the flap will be pedicled. Basing the flap superiorly or inferiorly will allow sufficient length to place the skin island in the oral cavity. Occasionally, periosteum from the clavicle or full- or split-thickness clavicle can be incor-porated as part of an SCM flap. This necessitates a superiorly based flap, which carries with it the advantage of preserving the most robust arterial feeders, namely, the occipital and the superior thyroid. Its disadvantage is that the platysma muscle overlies the SCM in the caudal neck. This extra layer of tissue between the SCM and the skin island reduces the perforators that supply the skin in this region, and authors have noted a substantial rate of partial or complete skin island necrosis. This is even more common in an irradiated neck. The inferiorly based SCM flap carries with it the advantage of a more robust supply of skin perforators because the platysma does not cross between the SCM and the skin in this region of the neck. The disadvantage of a inferiorly based flap is that it relies on caudal arterial supply to the SCM muscle, branches off the thyrocervical trunk, which places the blood supply to the muscle as a whole in more jeopardy.

To incorporate periosteum for repair of the anterior tracheal wall or part of the larynx, care must be taken to elevate the periosteum in continuity with the SCM muscle to preserve the blood supply. This also holds true for partial-thickness or full-thickness clavicle. Clavicular bone can then be used to repair anterior tracheal/laryngeal defects. Meyer has popularized this technique, which has been ascribed to Lindholm.[13] It is recommended that if periosteum is being used as a patch to repair the anterior tracheal wall, a tracheostomy tube be placed inferior to the defect and either a ┬ tube (with the tracheostomy tube inserted into it) or a Montgomery laryngeal stent (with through-and-through stay sutures brought out through the skin and traversing from one side of the neck to the other while passing through the stent) be placed within the airway. In this manner, the flaccid periosteum will be stented to prevent collapse into the airway lumen. The Montgomery stent or ┬ tube would need to be removed later in the operating room.

Raising the SCM flap generally does not present unique challenges to the head and neck surgeon. All the vital structures of the carotid sheath, as well as the hypoglossal nerve, lie deep to the SCM muscle. In addition, the carotid sheath lies deep to the omohyoid muscle in the inferior aspect of the neck. The hypoglossal nerve lies deep to the digastric muscle more superiorly. Therefore, the SCM muscle may be raised relatively quickly if the omohyoid and digastric muscles are identified deep to it. Superiorly, one must be cognizant of cranial nerve XI as it courses superiorly. It will split the SCM muscle as it descends in the neck.

The arc of rotation must be carefully considered when planning this flap. In the case of a superiorly based flap, preservation of the superior thyroid artery will improve the blood supply but often restricts the arc of rotation. Generally, two of the three arterial supplies to the SCM muscle are sacrificed for the sake of attaining adequate rotation.

When the periosteum or clavicle is incorporated as part of the flap, the sternal head of the muscle can often be sacrificed for ease of placement of the clavicular head and periosteum or bone into the defect. Occasionally, looping the clavicular head deep to the sternal head will accomplish the same task without sacrifice of the sternal head.

TRAPEZIUS MUSCLE FLAP

Use of a cutaneous trapezius muscle flap extends back to 1842, when Mutter used it for the release of burn contractures in the neck. The three varieties of trapezius flap (superior, lateral island, and lower island) have been well described by many surgeons. These concepts are defined in the following text as they relate to specific flaps. [14–17]

The trapezius is a triangular muscle that extends along the midline of the spine from the skull base to the about the 10th thoracic vertebra. It inserts on the lateral third of the clavicle, the scapular spine, and the acromion. It defines the posterior border of the posterior triangle of the neck. The trapezius functions to elevate and retract the shoulder and rotate the scapula.

Motor innervation of the trapezius is supplied by the spinal accessory nerve, cranial nerve XI. Contributions from C2 to C4 are also present, but it is unclear to what degree they play a role in functioning of the muscle. The blood supply to the trapezius is from the occipital artery, paraspinous perforators, the transverse cervical artery, and the dorsal scapular artery.

There are three distinct ways that the trapezius muscle can be used as a flap for head and neck reconstruction, as described in the following sections.

Superior Trapezius Flap

This flap is based on the occipital artery and the paraspinous perforators. It extends from the occiput, along the anterior border of the trapezius toward the shoulder, and then back again medially up to the midline of the spine. It creates a long tongue of tissue, both muscle and skin, for use in the head and neck. Elevation of this flap relies on elevation of the trapezius muscle with the skin overlying it remaining attached. This flap has been described as being divided into three angiosomes. The first is the most medial; it extends from the midline of the spine toward the shoulder and receives its blood supply from the occipital artery and the paraspinous perforators. The second angiosome extends laterally from this one and receives its blood supply from the transverse cervical artery as it courses over the clavicle. The last angiosome extends laterally from the second and ends over the deltoid muscle. This last angiosome receives its blood supply from a branch of the thoracoacromial artery. Choke arteries that run through the skin allow the paraspinous perforators to supply the third angiosome if the transverse cervical artery is interrupted, such as during the course of neck dissection. This flap can then be swung medially onto the neck to repair loss of cutaneous tissue on the neck. A skin graft is required for closure of the donor site defect. Either intervening skin from the neck that is covered by the flap is removed so that the entire length of the flap can be inset, or the underlying neck skin can be left in place and the base of the flap taken down and replaced in its original location as a delayed secondary procedure.

Lateral Island Flap

In this flap the transverse cervical artery (TCA) and vein (TCV) must be meticulously dissected in the inferior portion of the posterior triangle of the neck and traced to their entry into the trapezius muscle. The skin island is situated along the anterior edge of the trapezius and extends inferiorly along the back of the patient. Care must be taken to preserve the pedicle artery and vein, especially if neck dissection has previously been performed. Additionally, the TCA and TCV may pass through portions of the brachial plexus and not allow harvest of the flap because of an inability to rotate the flap into position. Once the TCA and TCV have been dissected in the root of the neck and followed to their insertion in the trapezius muscle, the skin island can be adjusted so that the vascular pedicle is centered in the skin island. After the pedicle has been secured, a skin incision is made around the skin island and through the trapezius muscle. The skin and muscle island is then elevated off the underlying muscles while paying attention to not disrupt the vascular pedicle. The pedicle and attached skin/muscle island are then swung into position in the neck. Greater arc of rotation can be obtained when medial dissection along the pedicle frees the pedicle from surrounding tissue. Closure of the donor site defect can then be accomplished, frequently without a skin graft, as long as wide undermining is done.

Lower Trapezius Island Flap

This flap has the longest arc of rotation of any of the three; however, it does require exposure of the patient's back and therefore positioning the patient in the decubitus position is required (Fig. 82-3). The arm is ad-ducted and medially rotated. The lower trapezius flap is based on the TCA and possibly the dorsal scapular artery (DSA). The skin island is positioned between the spine and the medial edge of the scapula. Dissection starts by incising the skin from the distal tip of the skin island superiorly toward the clavicle. Wide undermining of the medial and lateral skin is then accomplished. The inferior lateral edge of the trapezius muscle is identified and then dissected from the underlying muscles by proceeding in a superior direction. The skin island remains attached to the trapezius muscle as it is elevated. The DSA and dorsal scapular vein (DSV) will be encountered as they penetrate from the underlying rhomboids into the inferior portion of the trapezius muscle. With digital pressure the artery can be

compressed lightly and bleeding from the edge of the skin island assessed. If deemed adequate, the DSA and DSV can be ligated and the dissection continued superiorly. The trapezius muscle must be freed from its attachments along the spine. In doing this the paraspinous perforators must be cauterized or ligated. Additionally, the attachments to the scapular spine must be incised. The TCA and TCV will be identified as the superior edge of the levator scapulae and the rhomboid minor are encountered. The DSA enters the trapezius from the deep musculature, between the rhomboid major and minor, inferior to the entry of the TCA. This flap will often yield a lengthy pedicle sufficient to reach to the auricle or side of the face.

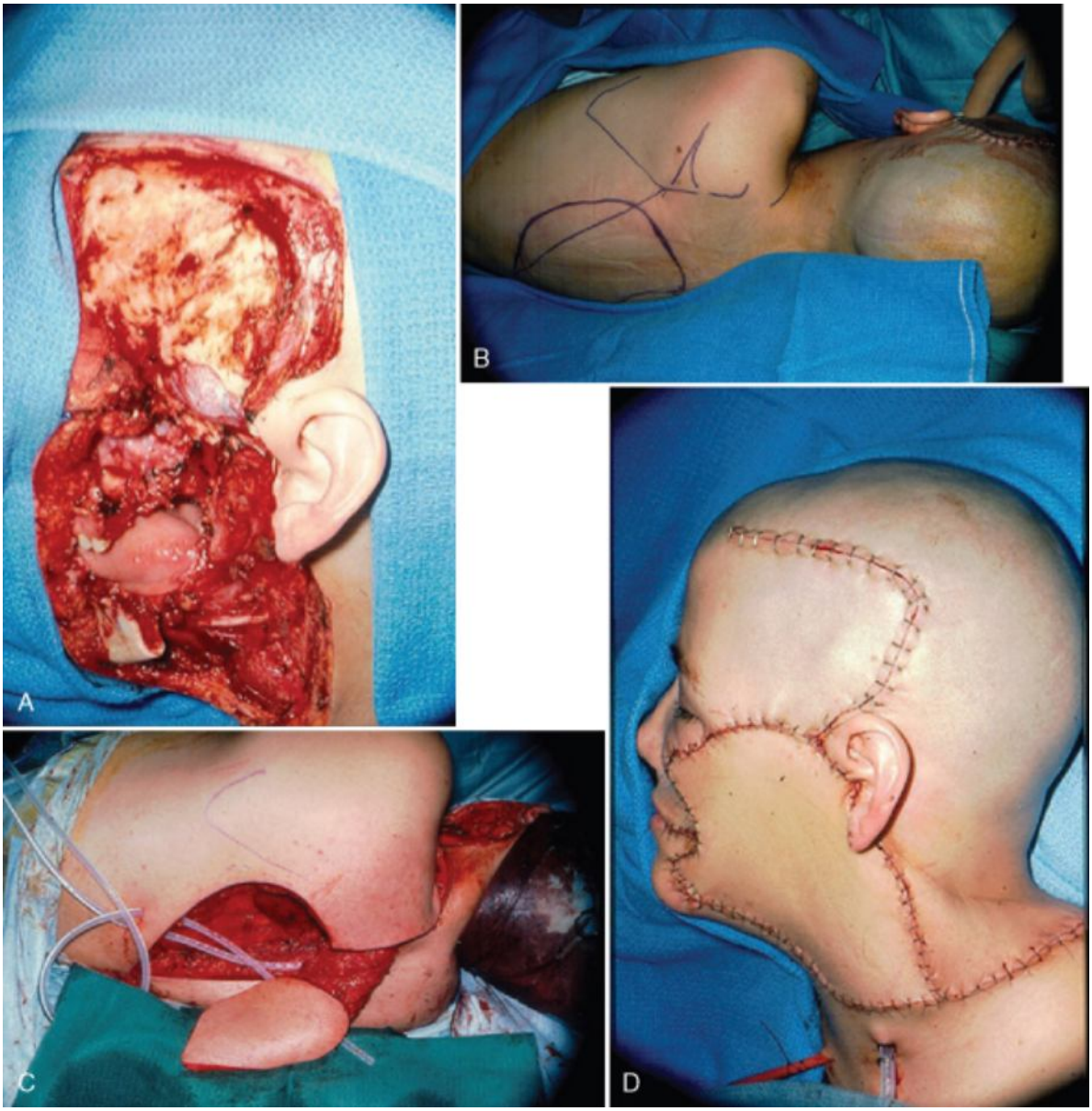

Figure 82-3 Trapezius flap. **A,** Defect of the face and scalp. **B,** Planning of the trapezius flap. **C,** Elevation of the trapezius flap. **D,** Reconstruction with the trapezius flap.
(Courtesy of Dr. B. Chandrasekhar.)

TEMPOROPARIETAL FASCIAL FLAP

The temporoparietal fascial flap is useful for reconstruction of the ear, the orbit, the anterior cranial base, the superior and middle thirds of the face, and even the oral cavity (Fig. 82-4).[18–20] The anatomy is quite straightforward in that the flap is based on the parietal branch or the superficial temporal artery and vein. These vessels ascend just anterior to the auricle and branch approximately 2 to 4 cm above the zygomatic arch. They must be preserved when raising the flap, especially as one approaches the base of the flap. A Doppler monitor may be helpful in guiding dissection.

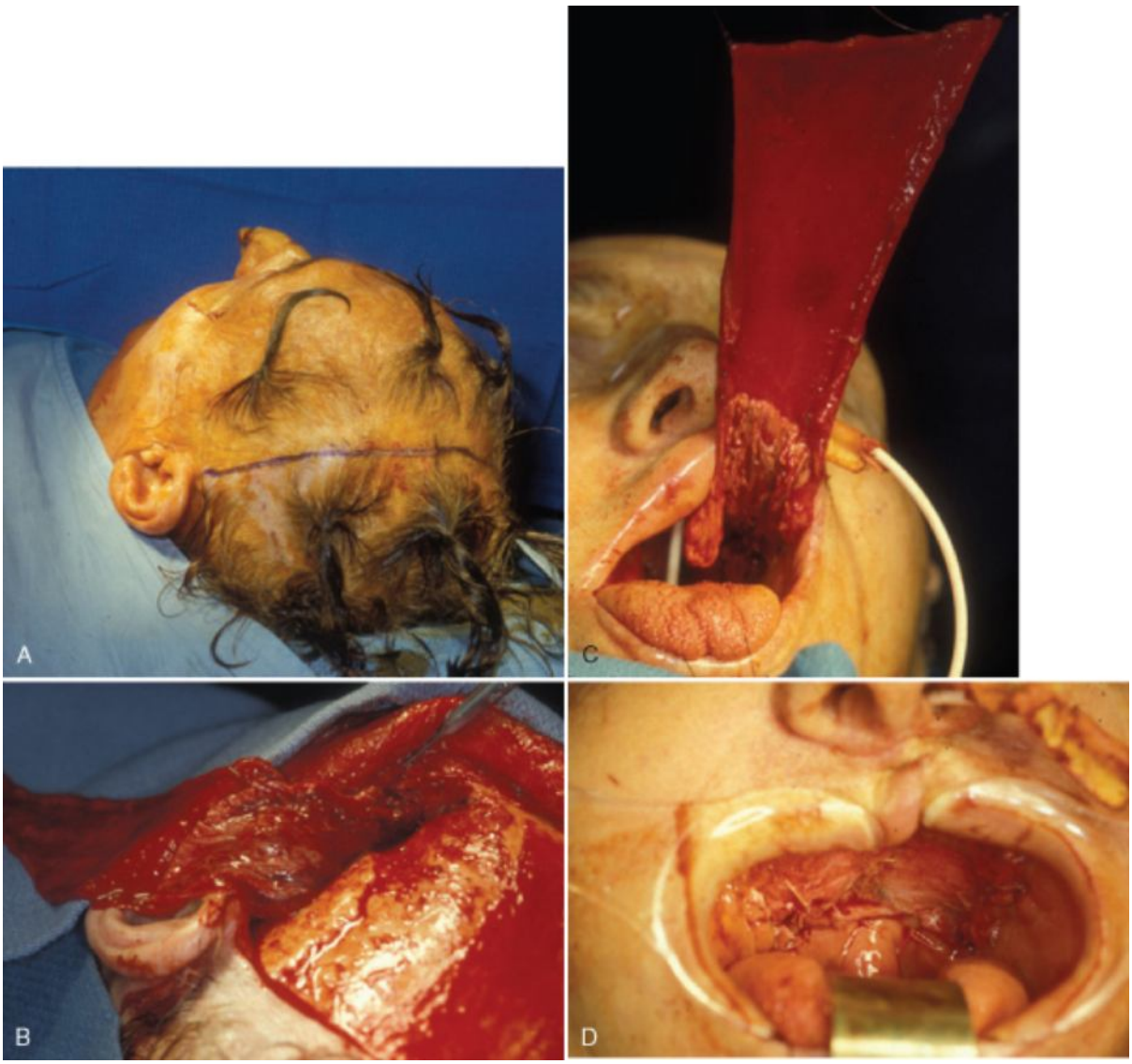

Figure 82-4 Temporoparietal fascia (TPF) flap. **A**, Planning the TPF flap incision. **B**, Elevation of the TPF flap. **C**, Delivery of the TPF flap into the oral cavity. **D**, TPF flap in place to close an intraoral defect.
(Courtesy of Dr. Michael Carstens.)

The flap is approached with a scalp incision from the root of the helix of the ear to the top of the temporal fossa. The scalp is raised off the deeper soft tissues in an adipose plane below the hair follicles. Care must be exerted here so that no areas of alopecia are created by dissection that is too superficial. The soft tissues are incised in an arc paralleling the line of origin of the temporalis muscle, and the flap is raised off the deep temporalis fascia itself. Anteriorly, care must be taken to avoid injury to the temporal branch of the facial nerve. The flap includes the galea and may be extended somewhat by including periosteum above the line of origin of the temporalis. The flap is narrowed as the base of the pedicle is approached at the point where the parietal branch of the superficial temporal artery enters the flap.

Closure of the donor defect is direct, and there should be no observable donor defect. The flap can be buried or covered with a split-thickness skin graft with great success. It will reach the orbit and the oral cavity with ease. This flap is without peer in covering the cartilage framework of the external ear.

TEMPORALIS MUSCLE FLAP

The temporalis muscle flap is particularly useful for reconstruction of defects in the region of the auricle, the orbit and infratemporal fossa, and the hard palate and even intraoral defects (Fig. 82-5).[21–23] It is not used with a cutaneous component because a scalp defect and an area of alopecia would be created.

Figure 82-5 Temporalis flap. **A,** Defect in the auricular area covered with a temporalis flap. **B,** Late follow-up of the temporalis flap.

The temporalis muscle is fan shaped and passes under the zygomatic arch to insert on the coronoid process of the mandible. There are two major vascular inputs, the anterior and the posterior deep temporal arteries. After freeing its origin, the muscle can be turned posteriorly over a defect in the auricular area or moved anteriorly to fill the orbit. If a portion of the zygomatic arch is removed, the muscle may be advanced caudally to the lower border of the mandible.

Flap elevation is quite easy, and the challenge to the surgeon is usually moving the muscle where it is needed once the origin is released. Most commonly it is directed toward the orbit, the infratemporal fossa, or the hard palate.

DELTOPECTORAL FLAP

The deltopectoral flap was once the most commonly used flap in head and neck surgery, but it has largely been superseded by the pectoralis major flap, which is more robust and can be raised and inset with confidence without a delay procedure.[24–26] The deltopectoral flap can be used with great success for reconstruction of defects of the middle and lower thirds of the face, the oral cavity, the neck, and the esophagus (Fig. 82-6).

Figure 82-6 Deltopectoral (DP) flap. **A,** Hypopharyngeal defect. **B,** Delay of the DP flap with a split-thickness skin graft on the underside. **C,** Elevation of the DP flap with a skin graft for lining at the site of the defect. **D,** DP flap in place with a skin graft placed over the donor defect. *(Courtesy of Dr. Frederic W.-B. Deleyiannis.)*

It is raised over the upper part of the chest, based in the peristernal area, and extended laterally and cephalad to the deltoid region. It may even be extended to the posterior aspect of the shoulder if delayed. It is perfused by the first through third peristernal perforators of the internal mammary artery. A flap 10 cm in width and 20 cm in length can be reliably raised and used with a high likelihood of success. Longer flaps should be delayed. The fascia of the pectoralis major muscle may be raised with the flap.

When the end of the flap is inset for its intended purpose, the proximal portion of the flap that is not inset as part of the reconstruction may be tubed. Later, 2 or 3 weeks after elevation, the flap may be divided with inset of the base of the flap into the donor area, or the redundant flap may simply be excised. Skin grafting is usually required to close the donor site wound, and the resulting defect is noticeable.

CERVICOPECTORAL FLAP

The cervicopectoral flap is a skin flap of large proportions that affords coverage of lateral neck and cheek defects.[27] The blood supply is essentially that of the deltopectoral flap. The skin flap is raised from the inferior border of the neck or cheek defect across the trapezius muscle 2 cm behind its anterior border and down across the acromioclavicular point of the shoulder and the top of the anterior axillary fold (Fig. 82-7). A backcut may be needed to facilitate full rotation, and dog-ears at the anterior jaw line and in the axilla should be excised at the time of closure. The flap is raised in a plane just deep to the platysma muscle and the anterior pectoral fascia, and care must be exercised to avoid disruption of the internal thoracic perforators medially at the very base of the flap.

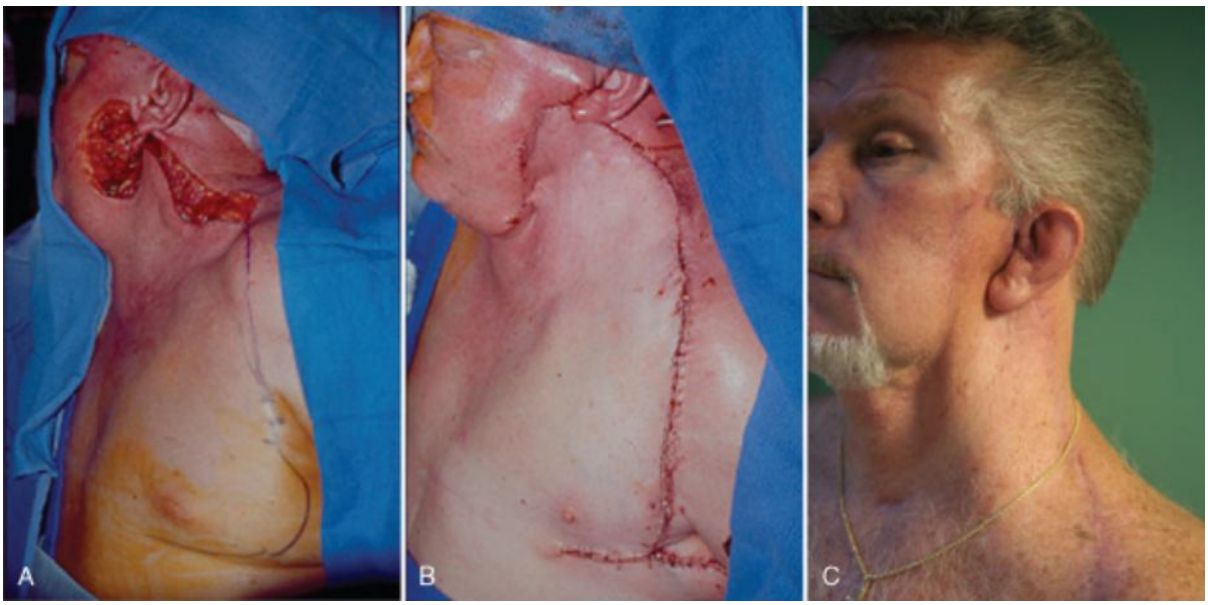

Figure 82-7 Cervicopectoral flap. **A**, Defect requiring closure. **B**, Elevation and advancement of the cervicopectoral flap with elimination of the defect. **C**, The flap has healed completely and the patient has undergone postoperative radiation therapy.
(Courtesy of Dr. James Russavage.)

The cervicopectoral flap has skin color and texture like that of the resected skin, although depending on the cephalad border it may not carry bearded skin. It can be assessed via fluorescein perfusion before full inset to ensure reconstruction with fully viable tissue. Extensive mobilization will allow closure of defects measuring 10 cm in diameter with a very satisfactory appearance at the site of reconstruction and a minimal donor site defect. The scar is quite acceptable and the flap is robust. To achieve the advancement possible with this flap, the surgeon must undermine extensively. The plane is easily entered and traversed, and there is very low morbidity. In view of the ready availability of this flap and the excellent tissue match, this flap is probably underused for head and neck reconstruction.

CONCLUSION

This listing will provide the head and neck surgeon with a number of options for restoring cover and continence at places where defects are created. As pointed out, these flaps do not require much time and can bring a long extirpative operation to a fairly rapid conclusion. Familiarity with these techniques will prove lifesaving for some patients. Local pedicled flaps have been one of the factors that have transformed head and neck surgery to the safer and predictable endeavor that it is today. These flaps are a welcome alternative at crucial moments in the treatment of patients stricken with neoplasms of the head and neck.

PEARLS

- A good working knowledge of the anatomy of the muscles of the head and neck and upper thorax is essential for the successful use of pedicle flaps.
- The pectoralis major flap is almost always a good alternative for reconstruction of head and neck defects.
- The latissimus dorsi and the cervicopectoral flaps are often excellent choices for head and neck reconstruction.
- Planning can afford both lining at the mucosal level and skin cover when both are needed.
- When flaps are passed subcutaneously, the passageway must be large to avoid constriction of the pedicle.

PITFALLS

- A lack of respect for the vascular anatomy of a pedicle flap will often result in compromise of the flap and even its loss.
- Be on the lookout for a lateral thoracic contribution that is the dominant artery serving the sternal portion of the pectoralis major muscle.

- Do not forget that fluorescein testing of flaps can help one ensure a successful reconstruction. Failure to test when in doubt may result in a necrotic flap.
- Support for the flaps with multiple suture suspensions and no tension along the line of the flap is essential for aesthetically pleasing reconstructions.
- Do not forget that flaps can be revised with benefit when the primary mission of closure and recovery is accomplished, and do not forget to assure the patient of this.