Five-Year Retrospective Review of the Extended SMAS

Critical Landmarks and Technical Refinements

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Abstract: The beneficial effects of SMAS flap manipulation have been clearly demonstrated for the neck and jowls; however, safe limits of subplatysmal dissection in the neck have not been established, and recommendations vary widely.

Sixty patients undergoing rhytidectomy with an extended SMAS flap were retrospectively reviewed over a 5-year period. Five critical landmarks for extended SMAS flap dissection were marked preoperatively and confirmed intraoperatively. Skin flaps were mobilized and redraped independently.

All patients were available for follow-up at an average of 8.3 months postoperatively (range 5–23 months). There were no clinically apparent facial or great auricular nerve injuries or pixy-ear deformities. Wound complication rates were acceptably low and included hematoma (3%), retroauricular epidermolysis (5%), and temporal scalp alopecia (1.6%).

Extended SMAS flap dissection allows safe, predictable, and durable correction of the neck and jowls. The degree of mobilization proposed in this study allows anchoring points of the SMAS flap to be removed from potentially visible and palpable areas on the face to the temporal fascia superiorly and the mastoid fascia posteriorly. The study also represents a departure from more conventional facelifting techniques that advocate dissection of a mesomandibularis.

Key Words: facelift, extended SMAS, SMAS flap dissection, facelift landmarks

(*Ann Plast Surg* 2009;62: 492–496)

The SMAS has been intensively studied as a useful vehicle for correction of aged features of the lower face and neck. The best technique of SMAS manipulation remains elusive and may never be identified; however, this report highlights the effectiveness of extended SMAS dissection.

Due to the large array of differing and inconsistent descriptions of SMAS flap dissection, a summary of common techniques and proposed nomenclature is given in Table 1. Safe limits of sub-SMAS dissection in the face have been well established and are identified as points A and E (Fig. 1). In this retrospective review, sub-SMAS dissection in the neck was continued to points B, C, and D (Fig. 2).

Guidelines for sub-SMAS dissection of the neck are variable, ranging from no dissection below the mandibular border up to 6 cm below the mandibular border.[1–4] This variability may be due to a number of factors including previous studies that compartmentalize the SMAS into separate facial and neck subunits separated by the inferior mandibular border, variability of facial nerve anatomy, and differing descriptions of SMAS anatomy.[5–11] This study offers landmarks that can be topographically identified externally as well as intraoperatively. These landmarks facilitate preoperative planning and intraoperative execution.

Received August 20, 2008 and accepted for publication August 25, 2008.
From Plastic and Reconstructive Surgery, Metairie, LA.
Financial Disclosure: All funding for this work was supplied by John T. Lindsey, MD. The author has no commercial association or financial disclosures.
Presented at the 51st Annual Meeting of the Southeastern Society of Plastic and Reconstructive Surgeons, Boca Raton, FL, June 2008.
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ISSN: 0148-7043/09/6205-0492
DOI: 10.1097/SAP.0b013e31818ba77d

Critical Landmarks for the Extended SMAS (Fig. 1)

Point A.

1 cm below the zygomatic arch. This well-established landmark respects the course of the frontal branch of the facial nerve and represents the superior extent of sub-SMAS dissection.

Point B.

3 cm below the ear lobule along the anterior border of the sternocleidomastoid muscle. Release and dissection of the platysmaauricular ligament begins here, approximately 2 cm anterior to the great auricular nerve and 1 cm anterior to the external jugular vein. Posterior fibers of the platysma are visible here and allow elevation in an areolar, near bloodless plane.

Point C.

5 cm below the mandibular angle at the anterior border of the sternocleidomastoid muscle. This marks the inferior extent of subplatysmal dissection, as the muscle attenuates at this level, and further inferior dissection does not allow an improved vector of pull on the neck or an improved cervicomental angle.

Point D.

Intersection of the facial vein with the inferior mandibular border. This marks the anterior extent of subplatysmal dissection in the neck. At this intersection, the marginal mandibular nerve crosses superficial to the facial vein. This point can be marked preoperatively, as the facial artery (adjacent to the facial vein) becomes palpable as it crosses the mandibular border. This point also corresponds to an area approximately one finger's breath anterior to the lower anterior border of the masseter muscle at its insertion along the mandibular body.

Point E.

Lateral border of the zygomaticus major muscle. This well-recognized landmark is the anterior limit of sub-SMAS dissection in the cheek. This landmark can also be marked preoperatively by palpating the zygomaticus major during full-denture smile.

SURGICAL TECHNIQUE

The extended SMAS elevation is begun by incising and elevating the flap according to the dashed lines in Figure 1, which includes points A, B, and C, and release of the platysma auricular ligament. Sub-SMAS dissection proceeds to points D and E (Fig. 2).

The SMAS flap is split into superior and inferior leaves to allow anchoring to the temporal fascia superior to the ear and to the mastoid fascia posteriorly (Fig. 3). Vectors of pull are adjusted to allow for desired facial effects. The V of the SMAS flap cradles the earlobe attachment to the face without distortion (Fig. 4).

Skin undermining is liberally performed as reported by others[11a,11b] to allow independent redraping. Subcutaneous undermining extends to or across the nasolabial fold, to the midline of the neck, over the jowls, and to the oral commissures as dictated by individual anatomic requirements. Adjunctive procedures performed in this series, when indicated, included corset platysmaplasty for

TABLE 1. Common Techniques of SMAS Flap Manipulation and Proposed Nomenclature

Technique	Anatomy	Advantages	Disadvantages
Plication	Gathering technique of SMAS in preauricular area	Speed, safety	Limited mobilization and effect, visible bunching in preauricular area, minimal effect on neck
SMASectomy	Excision of crescent shaped preauricular segment of SMAS	Speed, safety	Limited mobilization and effect, potential visible suture line in preauricular area, minimal effect on neck
Limited SMAS	Sub-SMAS, dissection to anterior and inferior borders of parotid, superior limit 1-cm below zygomatic arch	More effect on marionette lines and jowls, some effect on neck	Suture lines required over zygomatic and preauricular areas with potential for visibility and irregularity
Standard SMAS	Same as limited SMAS except dissection is carried anteriorly to lateral border of ZM	Good corrections of marionette lines and jowls, mild effect on neck, mobilization allows anterior anchoring sutures to be moved off face to temporal fascia	Increased risk to zygomatic and buccal branches of facial nerve
Deep plane	Same as standard SMAS except anterior dissection becomes superficial at lateral border of ZM to mobilize malar fat pad	Same as standard SMAS with added elevation of malar fat pad and improved nasolabial fold	Same as standard SMAS, technically demanding, extensive dissection
High SMAS	Same as standard SMAS except anterior SMAS dissection is carried to the lateral canthus and then angled downward over zygoma to allow access to malar fat pad	Same as deep plane	Same as deep plane
Extended SMAS	Same as standard SMAS except inferior dissection extends below mandibular border	Creation of continuous SMAS–platysmal flap allows maximum effect on lower face and neck, anchoring sutures off face to temporal fascia anteriorly and mastoid fascia posteriorly	Same as standard SMAS, direct observation of marginal mandibular and cervical nerves required

ZM indicates zygomaticus major.

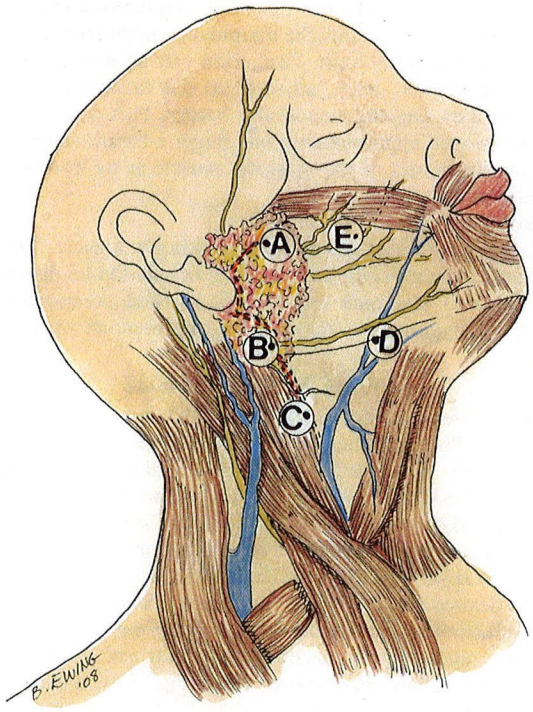

FIGURE 1. Critical landmarks for extended SMAS dissection to be palpated and marked preoperatively. Flap elevation is begun by incising the SMAS/platysma flap along points A, B, and C.

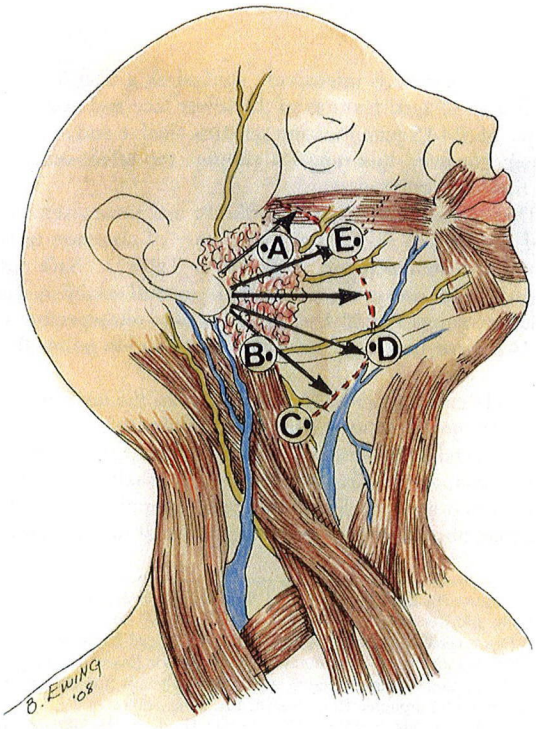

FIGURE 2. Elevation of extended sub-SMAS/platysma flap. Sub-SMAS/platysma dissection continues to a gentle arc containing points C, D, and E.

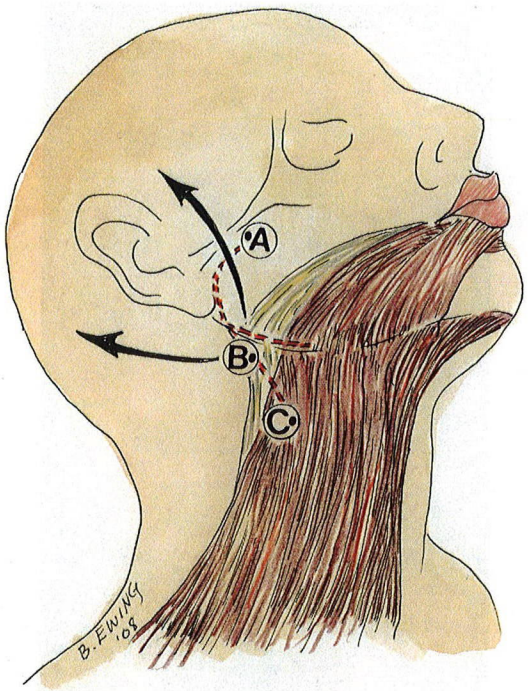

FIGURE 3. SMAS flap division into superior and inferior leaves.

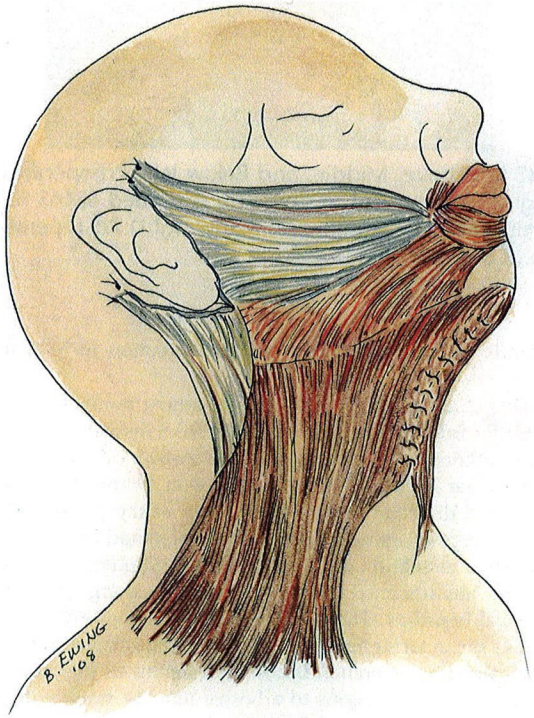

FIGURE 4. Anchoring of SMAS flap to temporal fascia anteriorly and mastoid fascia posteriorly.

nondecussated platysma muscles, submental and jowl liposuction, and direct debulking and contouring of subcutaneous jowl and submental fat. Division of platysmal bands was not necessary in this series. The 0.5-inch Penrose drains placed underneath the skin flaps were removed on postoperative day 1.

PATIENTS AND METHODS

Between January 2002 and February 2007, 60 consecutive patients underwent extended SMAS rhytidectomy under general anesthesia in an accredited ambulatory surgery center by the author. Appropriate medical workup and clearance were obtained. Follow-up photographs were obtained at 2 and 6 months postoperatively.

RESULTS

All patients were available for follow-up ranging from 5 to 23 months (average 8.3 months). Complications included 2 facial hematomas (3%) requiring drainage, one of which required return to the operating room. There were 3 instances of retroauricular epidermolysis (5%) that healed secondarily, and one area of temporal scalp alopecia (1.6%) that required revision under local anesthesia in the office. There were no clinically apparent facial or great auricular nerve injuries or pixy-ear deformities. Representative preoperative markings and intraoperative extended

FIGURE 7. (Above, Middle, and Below left) Preoperative photographs of patient undergoing extended SMAS rhytidectomy. (Above, Middle, and Below right) Postoperative results at 6 months.

SMAS flap elevation are shown in Figures 5 and 6. Representative pre- and postoperative photographs are shown in Figures 7 and 8.

DISCUSSION

The superficial fascial system of the head and neck, originally described in 1859 as the epicranius by Gray and further studied by Mitz and Peyronie,[12] Scoog,[13] Jost and Levet,[14] and others has traditionally been compartmentalized into forehead, cheek, and neck subunits surgically separated by the mesotemporalis and mesomandibularis, respectively.[15,16] The firm attachment of the SMAS to the zygoma and the vulnerability of the frontal branch precludes in continuity sub-SMAS dissection between the forehead and cheek. The cheek and neck subunits, however, have recently been treated as a single unit (rather than 2 separate units separated by a mesomandibularis) by in continuity sub-SMAS dissection in the cheek with subplatysmal dissection in the neck.[17,18] This extended SMAS dissection has been advocated as a more direct approach for correction of aged features of the lower face and neck; however, recommendations for sub-SMAS dissection in the neck are sparse and variable.

This study adds to the substantial body of literature attesting to the safety and effectiveness of SMAS flap dissection while further defining extended SMAS flap mobilization and fixation. The importance of preoperatively identifying and marking critical landmarks cannot be overstated. It is the opinion of this author that there is no substitute for proper SMAS flap elevation and fixation, as this consistently yields smooth and lasting correction in both the face and neck.

This study suggests a gentle arc joining points C and D as a safe limit for inferior and anterior sub-SMAS dissection in the neck. Previous authorities have suggested no sub-SMAS dissection below the mandibular border,[19] limited dissection below the mandibular border,[20] and dissection up to the margin of the parotid gland.[1,21] LaTrenta suggests up to 6 cm below the mandibular border.[3,22] Subplatysmal dissection must continue in a bloodless, areolar plane to allow for identification and protection of the marginal mandibular and cervical branches. The facial vein at the mandibular border was selected as the anterior border of dissection because at this point the marginal mandibular branch becomes adherent to the undersurface of the platysma, as it begins to arborize into the muscle. Similarly, either one or more cervical branches become more fiber-like and begin to penetrate the undersurface of the platysma along the arc from point C to D.

The platysma flap should be started at point B to avoid injury to the great auricular nerve and the external jugular vein. Previous authorities have suggested dissection along the posterior margin of the platysma muscle[23]; however, the posterior border of the platysma varies and can extend over the sternocleidomastoid muscle. Subplatys-

mal dissection here puts these structures at risk and may account for the high incidence of nerve injury in this area.[24]

Further technical refinement of anchoring the SMAS flap is presented in this paper. Previous authorities have recommended SMAS flap fixation along the length of the zygomatic arch,[25,26] in the preauricular area,[27,28,29] and posterior to the earlobe.[30] In this study, the SMAS flap was mobilized sufficiently to allow division into superior and inferior leaves and fixation to the temporal fascia anteriorly and to the mastoid fascia posteriorly. This allows removal of the anchoring suture lines away from the facial area where they are potentially palpable and visible, and also away from areas where there is potential for damage to important underlying structures. These anchoring areas also avoid tension on the ear and the potential for pixy deformity. It is also the author's impression that the temporal and mastoid fascias allow for a more sturdy SMAS fixation.

The superior and inferior leaves of SMAS can be independently adjusted for the face and neck. No Vicryl mesh, suspension sutures or other foreign materials were used in this study. The upward sweep of the superior leaf on the facial soft tissues allows some improvement of the midface and ptotic malar fat pad; however, this is a known shortcoming of this particular technique.[31]

Compartmentalization of rhytidectomy into forehead and cheek subunits continues to be a useful concept; however, compartmentalization of cheek and neck subunits has not. Anatomic similarities between the cheek and neck areas allow continuous dissection of an extended SMAS flap using the proposed parameters. Limits of dissection in both areas are defined by the deep surface innervation of the superficial mimetic musculature. In the cheek, this occurs approximately at the lateral border of the zygomaticus major muscle. In the neck, this area is variable; however, using the parameters in this paper, there were no clinically detectible marginal mandibular or cervical nerve injuries.

The guidelines and limitations for extended SMAS dissection proposed in this paper are compatible with classic facial nerve anatomy studies of Dingman and Grabb,[32] and Baker and Conley.[33] These studies charted the course of the marginal mandibular branch but did not comment on the location of penetration into the platysma muscle, which is of importance in sub-SMAS dissection. The course and variations of the cervical branch have been less well studied, and this uncertainty has led to the previous recommendation for a subcutaneous (or preplatysmal) dissection in the neck. It is the opinion of this author that continuous sub-SMAS dissection in the cheek with subplatysmal dissection in the neck affords a more uniform contour, a more sturdy method of fixation, and a more direct approach to aged features of the lower face and neck.

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