

Relative Anchors or Retaining Ligaments of the Platysma from the Trunk, Neck, Face, and Head Associated with Rhytidectomies from Novel GAX-specimens, Fresh-Frozen and Formalin-Fixed Cadavers

Miller, Natalija¹ and Benninger, Brion^{1,2}. Medical Anatomy Center¹, Western University of Health Sciences, COMP-Northwest, Lebanon, 97355, OR. USA. Faculty General Surgery², Samaritan Health Services, Lebanon, and Corvallis, 97355, OR. USA.

ABSTRACT

AIM. The neck separates the head from the trunk as a cylinder with specialized tubes, glands and connective tissue layers of varying compliance, forming compartments, enabling degrees of movement within the neck and overall mobility of the head as well. Platysma is a transitional structure extending from the trunk to the head with relatively static anchors from deltopectoral fascia, superficial fascia of the sternocleidomastoid muscle (SCM), connective tissue from the mandible, merging into SMAS of the face, modiolus/zygomaticus medially, parotid gland fascia laterally and zygomaticus bone/periorbital region superiorly. Anterior bony landmarks are clavicle, mandible and zygomatic arch. Experts admittedly state confusing terminology. Platysma is a bidirectional muscle pulling the modiolus downward while simultaneously pulling the deltopectoral tissue upward. The study objective was to identify relative anchors of tissue of platysma from GAX-specimens, fresh frozen (FFzC) and formalin-fixed cadavers (FFC) rather than provide previous terminology. **METHOD.** Literature search and hemiface dissections of GAX-specimens-(n=6:12), FFzC-(n=12:22-2-hemifaces excluded with damaged clavicles) and FFC (n=15:27-3 had surgeries). **RESULTS.** No GAX-specimen studies and minimal FFzC and FFC have identified these connections. Anchors from clavicle GS-(11/12-91.7%), FFzC-(21/22-95.4%), FFC-(25/27-92.6). GS/FFzC/FFC-100% had increased resistance dissecting posterior 1/3 SCM border. Near mental foramen mandibular anchor identified GS-(10/12-83.3%), FFzC-(20/22-90.9%), FFC-(23/27-85.2%). Anchors into modiolus, parotid fascia and masseter GAX-specimens-(12/12-100%), FFzC-(24/24-100%), FFC-(27/27-100%). Anchors from zygomatic arch GS-(9/12-75%), FFzC-(19/22-86.4%), FFC-(22/27-81.5%). Anchors from soft tissue appeared more common than bone. **CONCLUSION.** This study demonstrated platysma anchors from fascia and bones between deltopectoral and facial regions supporting aging medicine and surgical procedures. Contemporary anatomy atlas/texts should reveal and describe them.

OBJECTIVE

The study objective was to identify relative anchors of tissue of platysma from GAX-specimens, fresh frozen (FFzC) and formalin-fixed cadavers (FFC) rather than provide previous terminology.

AIM - INTRODUCTION



Figure 2: German surgeon, Dr. Erich Lexer, credited as a founder of cosmetic surgery.

The platysma muscle serves as a common superficial integrator that extends from the trunk to the head. Along the way, relatively static anchors arise from the deltopectoral fascia, the superficial fascia of the sternocleidomastoid, the anterior auricle and from periosteum of clavicle, mandible, and zygomatic arch. These anchors are often released during medical procedures where subplatysmal and infra-SMAS flaps are necessary, like in rhytidectomies (i.e., “face lifts”) to aid in the redraping of the tissues (Figure 1). During the COVID-19 pandemic, the American Society of Plastic Surgeons (ASPS) reported over 230,000 rhytidectomies, attributed in part to the “Zoom Boom” phenomena. Dr. Erich Lexer, MD (Figure 2) is suspected to have been one of the first surgeons to have performed these procedures, pre-dating 1910. Despite this, experts admittedly state confusing terminology regarding these anchors of the platysma-SMAS fascial layers, and no prior cadaveric studies have fully identified these bony and soft tissue attachments.



Figure 1: Relative anchors, similar to a firm ice cream cone, are static wherein aging skin drapes along them to form redundancy.

METHODS

Literature search revealed and hemiface dissections of GAX-specimens-(n=6:12), FFzC-(n=12:22-2-hemifaces excluded with damaged clavicles) and FFC (n=15:27-3 had surgeries).

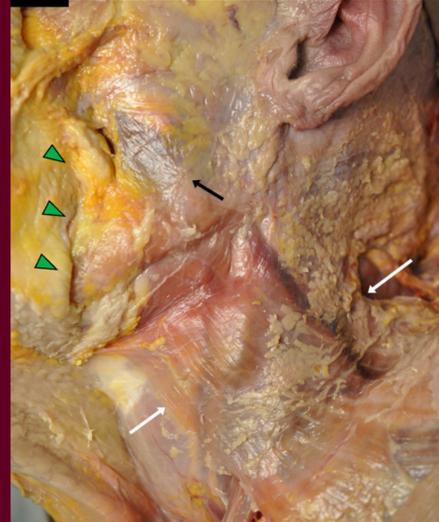


Figure 3: GAX specimen displaying the anteromedial and posterolateral platysmal boundaries ascending to modiolus (white arrows). Ascending fibers toward buccinator muscle (black arrow). SMAS reflected medially over orbicularis oris muscles (green arrowheads).



Figure 4: Caucasian female GAX-specimen with platysma muscle (green) fusing laterally with parotid fascia (white arrow), with auricular SMAS retaining anchor (blue arrow).

RESULTS

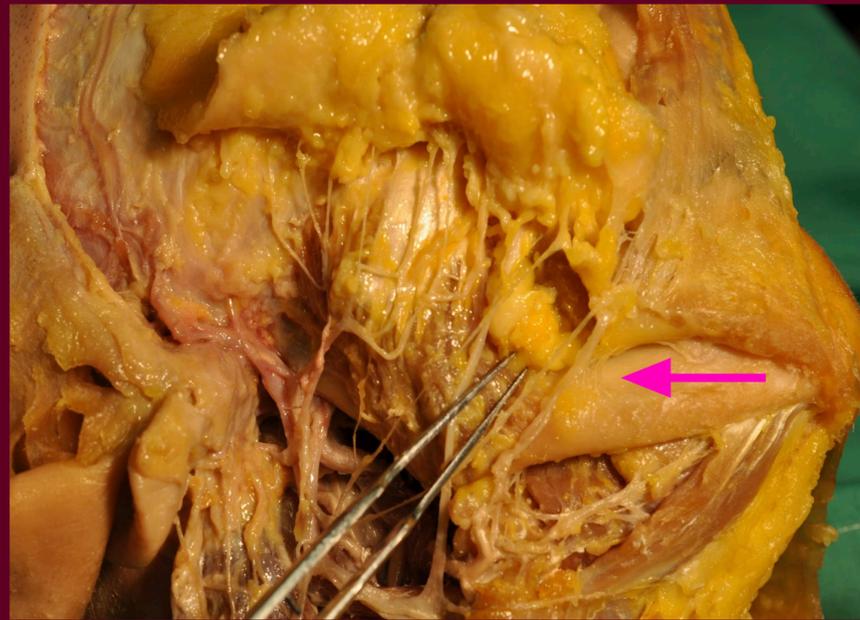


Figure 5: GAX-specimen status post parotidectomy with mandibular anchor extending off the periosteum (pink arrow). The marginal mandibular nerve can be seen intimately connected to this anchor. The buccal fat pad is highlighted to demonstrate the superior quality hydration and lifelike quality of GAX specimens.

No GAX-specimen studies and minimal FFzC and FFC have identified these connections. Anchors from clavicle GS-(11/12-91.7%), FFzC-(21/22-95.4%), FFC-(25/27-92.6). GS/FFzC/FFC-100% had increased resistance dissecting posterior 1/3 SCM border. Near mental foramen mandibular anchor identified GS-(10/12-83.3%), FFzC-(20/22-90.9%), FFC-(23/27-85.2%). Anchors into modiolus, parotid fascia and masseter GAX-specimens-(12/12-100%), FFzC-(24/24-100%), FFC-(27/27-100%). Anchors from zygomatic arch GS-(9/12-75%), FFzC-(19/22-86.4%), FFC-(22/27-81.5%). Anchors from soft tissue appeared more common than bone.

RESULTS CONTINUED

Consistent bony anchors seen across all preparations include the clavicular (GS n=11/12; FFzC n=21/22; FFC n=25/27), mandibular (GS n=10/12; FFzC n=20/22; FFC n=23/27), zygomatic (GS n=9/12; FFzC n=19/22; FFC n=22/27). Parotid, Masseteric, and Modiolus anchors were seen in 100% across all preparations. All preparations had increased resistance during dissection of posterior 1/3 of SCM. Anchors from soft tissue appeared more common than bone, marking this study as the first to describe these in detail (Figures 3-9).

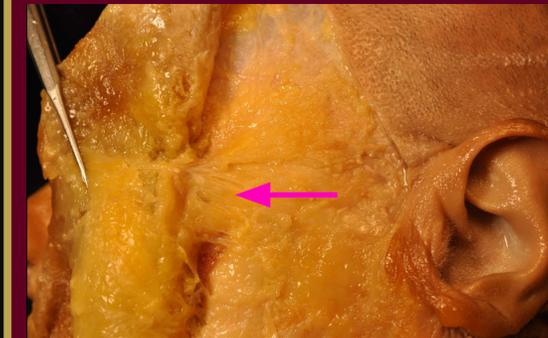


Figure 6: GAX specimen showing broad masseteric-SMAS soft tissue anchor (pink arrow) with skin reflected.



Figure 7: Zoomed in mandibular platysma-SMAS fascia anchor highlighted with forceps demonstrating muscular integration. In plane of view are suprathyoid and facial vessels, nerves, and lymph nodes.



Figure 8: Clavicular anchors longitudinally arising from the deltopectoral fascia (pink arrow) connecting the sternocleidomastoid and platysma muscles.



Figure 9: Zygomatic anchor superior to the masseter muscle highlighted with the pink arrow and forceps.

CONCLUSION

This study demonstrated that across 3 preparation methods, GS, FFzC, and FFC, consistently revealed relative anchors can be found intimate with the parotid, masseter, and modiolus regions, all of which are soft tissue anchors, none of which have previously been described. Stable periosteal anchors can also be found frequently across preparation methods at the clavicle, mandible, and zygomatic arch as well.

ACKNOWLEDGEMENTS

We would like to thank the Medical Anatomy Center, Brian Ireland - Kingsman Lab for preparing specimens and the University of Oregon Clinical Anatomy Research Lab, and to the McDaniel Surgical, Radiology, and Medical Anatomy Lab in Lebanon, OR. This research was made possible due to the amazing gift from the donor cadaver patients, thank you.

REFERENCES

References available upon request