The Infrazygomatic Segment of the Superficial Temporal Artery: Anatomy and Technique for Harvesting a Better Interposition Graft

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CNS 2016 ANNUAL MEETING San Diego CALIFORNIA SEPTEMBER 24-28, 2016

UCSF University of California San Francisco

Introduction

Currently existing techniques to harvest the superficial temporal artery (STA) for an interposition graft expose and harvest STA above the level of the zygoma. This yields a diminutive arterial segment both in length and diameter, which limits its use for extracranial-intracranial bypass, causing it to be underutilized as an interposition graft. This report aims to introduce a safe and efficient technique for harvesting of the infrazygomatic segment of the STA for its use as an interposition graft.

Methods

Eighteen specimens were examined to study the anatomy of scalp layers, STA, and the facial nerve. We measured the length of the STA segment harvested below the superior border of the zygomatic arch. We also measured the distance between the facial nerve and the STA to objectively assess the safety of this technique.

Results

Below the zygomatic arch, the only anatomical planes found between the facial nerve and the STA were the galea and subgaleal fat pad. The STA was contained in a dense subcutaneous band of galea, allowing proximal dissection of the artery without exposure of the facial nerve. The average length of the artery harvested between the zygomatic arch and the parotid gland was found to be 20 mm.

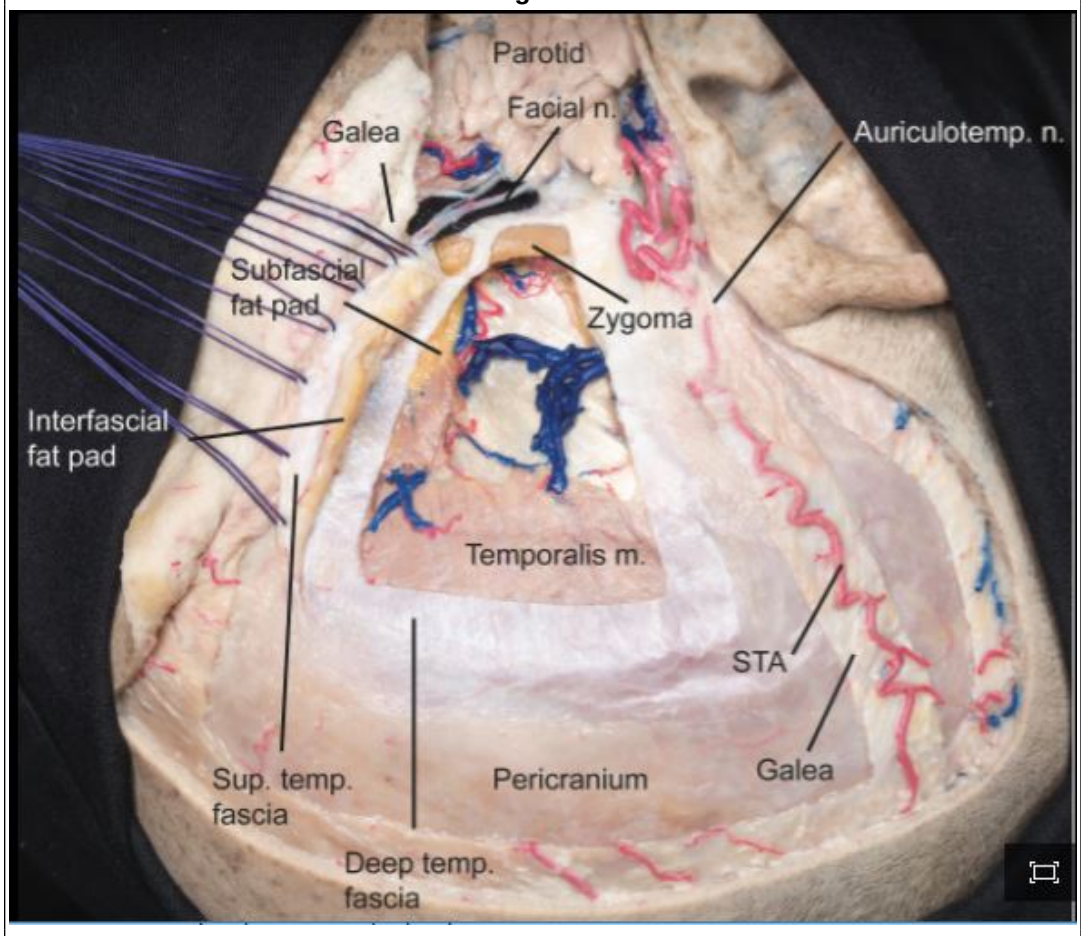
Conclusions

To ensure safe harvesting of the STA, subcutaneous dissection within the galea below the level of the zygomatic arch should be performed, preserving the dense subcutaneous band surrounding the STA. This technique avoids transecting the facial nerve branches and provides increased exposure of the STA. This anatomical knowledge may increase the use of STA as an interposition graft in cerebrovascular bypass procedures and potentially decrease morbidity by reducing the need to harvest grafts through additional incisions in remote sites.

Learning Objectives

By the conclusion of this session, participants should be able to:
(1) Understand the pathway of the STA in relation to fascial planes, at and below the zygomatic arch
(2) Note the relevance of harvesting the STA below the zygoma for EC-IC or IC-IC bypass
(3) Identify the fascial plane dividing the STA and facial nerve
(4) Learn how to harvest the STA below the tragus (classic) point

Figure 1



Dissection of scalp layers. Lateral to the superior temporal line, the scalp layers include from superficial to deep: (1) skin, (2) galea, (3) loose areolar tissue, (4) superficial temporal fascia, (5) interfascial fat pad, (6) deep temporal fascia, (7) subfascial fat pad, and (8) temporalis muscle. At the zygomatic arch, the superficial and deep temporal fasciae join and invest the arch to be continuous with the parotid capsule inferiorly.

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