Identification of the Facial Nerve Using the Posterior Auricular Artery as a Anatomic Landmark: A Cadaveric Study

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Introduction

Damage to the facial nerve (CNVII) is one of the most feared complications while performing parotidectomy. Despite preservation techniques, the rate of transient CNVII dysfunction with parotidectomy is up to 65% while that of permanent CNVII weakness has been reported to be 4-7% (1,2). Early identification of the CNVII using anatomical landmarks is critical in preventing iatrogenic injury to it during parotid surgery. The objective of this cadaveric surgical simulation study was to examine the relationship of the posterior auricular artery (PAA) with the main trunk of the CNVII, and to assess the utility of the PAA as an anatomic landmark for early identification of the CNVII during parotidectomy.

Methods

A standard cervico-mastoid-facial incision was performed in 5 cadaveric heads bilaterally. The PAA was exposed on the surface of the mastoid process and the relationship of the PAA and CNVII was studied and recorded. Measurements of the distance from the mastoid tip to the PAA (MT-PAA), the diameter of the PAA at the point where it crossed the CNVII, and the distances of the external meatal cartilage and the surface of the mastoid process from this point were recorded.

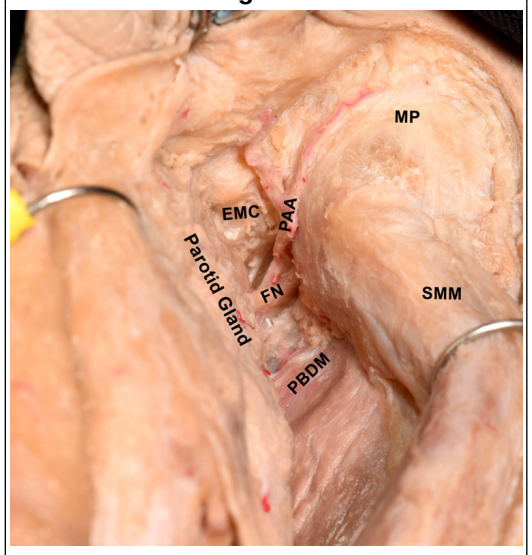
Results

In all specimens, the CNVII trunk crossed the PAA inferior to the stylomastoid foramen and could be identified by tracing the PAA proximally. The average distance MT-PAA was 12.9 ± 2.3 mm. The diameter of the PAA at the point where the it crossed CNVii was 1.8±0.2 mm. The distance of this point where the PAA and CNVII crossed to the external meatal cartilage was 5.2 ± 0.2 mm, while that to the surface of the mastoid process was 15.2 ± 2.7 mm.

Conclusions

Using the anatomic relationship between PAA and CNVII, the CNVII trunk can be identified by simply following the PAA towards the stylomastoid foramen. Thus, the PAA can be used as a novel anatomical landmark for identification of CNVII during parotidectomies, leading to lesser chances of inadvertent iatrogenic injury and risk of CNVII palsy.

Figure 1



Anatomic dissection demonstrating the relationship of the Posterior Auricular Artery (PAA) with the Facial Nerve. The facial nerve trunk was found to be always crossing the PAA inferior to the stylomastoid foramen.

PAA: posterior auricular artery; FN: facial nerve; MP: mastoid process; EMC: external meatal cartilage; PBDM: posterior belly of digastric muscle; SMM: sternocleidomastoid muscle

Learning Objectives

1. To understand the anatomic relationship between the facial nerve and the posterior auricular artery

2. To discuss the potential use of posterior auricular artery as a landmark for early identification of facial nerve during parotid surgery

References

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