ENDOSCOPIC ENDOONAL DISSECTION OF THE PTERYGOPATHELIC FOSSA, INFRAETEMPORAL FOSSA, AND POST-STYLOID COMPARTMENT. ANATOMIC RELATIONSHIPS AND IMPORTANCE OF EUSTACHIAN TUBE IN THE ENDOONAL SKULL BASE SURGERY

CARLOS M RIVERA-SERRANO, MD; RAMON TERE-FALCON, MD; JUAN FERNANDEZ-MIRANDA, MD; DANIEL PREVEDELLO, MD; CARL H SNYDERMAN, MD; PAUL GARDNER, MD; AMIN KASSAM, MD; RICARDO L CARRAU, MD

DEPARTMENT OF OTOLARYNGOLOGY

UPMC

INTRODUCTION

Endoscopic surgery has revolutionized the treatment of skull base disorders, and is routinely used in some centers for the treatment of neoplastic and non-neoplastic cranial base pathology. The group of minimally invasive endoscopic techniques used to approach the cranial base are also known as expanded endonasal approaches (EEA), which are classified in a modular fashion under two main categories: sagittal (or crano-caudal) and coronal (or medio-lateral).

The goals of this project are to develop an anatomical model to facilitate the study of the anatomy of the infratemporal fossa (ITF), pterygopateline fossa (PPF), and post-styloid space from the endonasal endoscopic perspective, and to determine the most important anatomical landmarks in the endonasal endoscopic approach to these areas.

MATERIALS AND METHODS

Eight pterygopateline and infratemporal fossae were dissected from cadaveric heads injected with colored latex. Rod-lens endoscopes with 0,30 and 45 degrees lenses, a neurosurgical microscope, and microsurgical endoscopic instruments were used for dissection. A trans-antral approach was performed to access the pterygopateline fossa, and a trans-sphenoidal approach was used to access the infratemporal fossa and post-styloid space.

RESULTS

Transanal and transsphenoidal approaches allowed dissection of pterygopateline and infratemporal structures. Dissection and resection of the sphenopateline artery, and detachment of the middle and lateral pterygoid muscles were essential to gain access to deeper structures. The lateral pterygoid plate was the most useful landmark for location of the foramen ovale and the mandibular branch of the inferior alveolar nerve. The Eustachian tube, the medial pterygoid plate, and stylohyoid process were the most useful landmarks to locate the post-styloid anatomic structures (internal parasympathetic carotid artery, internal jugular vein, cranial nerves IX and X).

REFERENCES


CONCLUSIONS

Along with more traditional surgical approaches to the ITF, PPF and post-styloid space, the endoscopic technique is a feasible surgical option. Precise anatomical knowledge from a endonasal endoscopic perspective should further increase safety and efficacy.

The most important landmarks for the location of post-styloid structures are the eustachian tube, the stylohyoid muscle and the jugular vein.

The principal obstacles to locate the parasympathetic carotid artery are the stylopharyngeal fossa and the carotid tuba.

Dissection in this area is difficult due to its fibromuscular nature and attachments to the surrounding structures.

The endonasal endoscopic approach to the cranial nerve X is located behind the parapharyngeal carotid. Cranial nerves XI and XII are not easily manipulated due to the post-styloid compartment. Limited access by the endonasal approach to the cranial nerve X and XII is limited to those locations located in the parapharyngeal carotid and internal jugular vein, or in the lymphoid tissue of the eustachian tube. The endonasal approach provides access to the parapharyngeal carotid and jugular vein, and is useful for the most accessible nerve for injury during an endonasal endoscopic approach to the post-styloid space.