

THE UTILITY OF THE 3D CTA RECONSTRUCTION OF THE MAXILLARY ARTERY IN THE PERCUTANEOUS APPROACH TO THE FORAMEN OVALE AND ITS CATEGORIZATION USING THE INVERTED PYRAMID CONCEPT

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BACKGROUND

The concept of the inverted pyramid focused on the extracranial trajectory of this corridor, previously introduced in the past. Intended to establish the anatomical structures at risk. There segments were defined: inferior third from cutaneous to the parotid duct, the middle third from parotid duct to lateral pterygoid muscle (LPM), and the superior third from the LPM to the plexus triangular.

OBJECTIVE

To integrate anatomical and radiological insights on the maxillary artery and the foramen ovale, aiming to improve the safety and precision for a multitude of surgical interventions.

METHODS

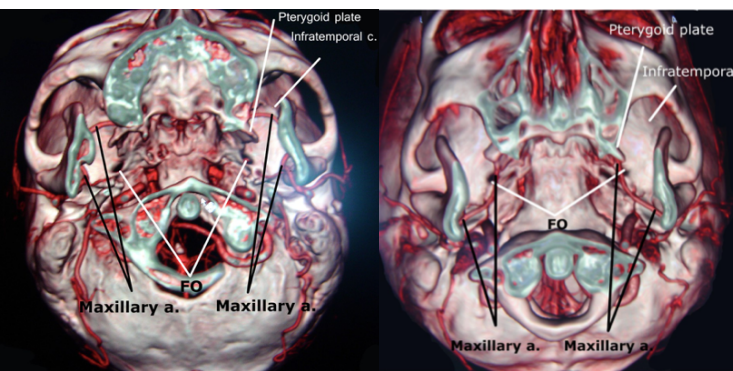


Fig 1A. Lateral Variant Fig 2A. Medial Variant

Six cadaveric heads (12 MA) were injected with red and blue latex. The arteries and surrounding structures were dissected and studied using microsurgical techniques. special attention to the course and branching pattern of the MA was given. Twenty CTA (3D reconstructions were studied and correlated with the anatomic dissection findings.)

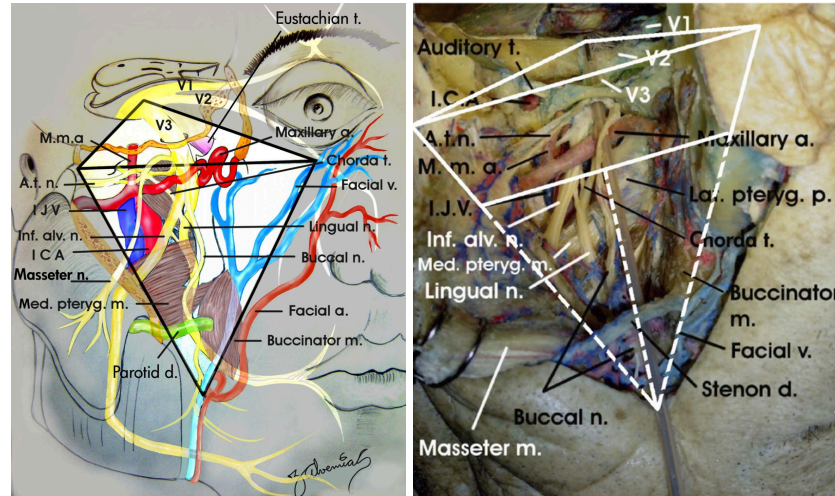


Fig2A. Drawing depicting the different anatomical structures surrounding Hartel's trajectory. Fig2B. The middle third of this pyramid is defined from the parotid duct to the lateral pterygoid muscle. The zygomatic arch has been removed, the ascending branch of the mandible bone cut, and the lateral aspect of the middle fossa floor has been drilled off.

RESULTS

Twenty Head CTA (40 sides) were analyzed. The course of the MA was found to be lateral to the LPM on 21 CTA sides (52.5%) and medial to the LPM on 19 sides (47.5%). The medial type is closely related to the F.O., whereas the lateral type is more distant. After evaluating side congruency, nine cases (45%) had the medial type and ten (50%) the lateral configuration as a mirror image along the contralateral side. Interestingly, one case (5%) had a lateral configuration on one side and a medial configuration on the other.

CONCLUSION

We found the CTA 3D reconstruction to be beneficial in identifying the course of the MA regarding the foramen Ovale, allowing us to predict these two variants with a 100% accuracy. In the lateral variant, the MA is always away from the percutaneous Foramen Ovale trajectory. In contrast, in the medial variant, the artery is near the foramen ovale, and in up to 16% of the cases, the MA is directly in the probe's trajectory.