

INPLASY PROTOCOL

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None declared.

Anastomosis between the posterior superior alveolar artery and the infra-orbital artery: systematic review and meta-analysis

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Review question / Objective: What is the frequency of anastomosis between the posterior superior alveolar artery and the infra-orbital artery in imaging studies?

Condition being studied: The objects of this systematic review were: (I) to determine the frequency of the anastomosis between the PSAA and the IOA in imaging studies; (II) to determine the most frequent diameter of this artery (<1mm, between 1.2 and 2 mm, greater than 2.1 mm); and (III) to determine the most frequent location. A secondary objective of this study was to carry out a review of the different terms used to name this vascular structure.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 August 2021 and was last updated on 18 August 2021 (registration number INPLASY202180071).

INTRODUCTION

Review question / Objective: What is the frequency of anastomosis between the posterior superior alveolar artery and the infra-orbital artery in imaging studies?

Rationale: The posterior superior alveolar artery (PSAA) and the infra-orbital artery

(IOA) present intraosseous and extraosseous rami which form an anastomosis in the lateral wall of the maxillary sinus. The anastomosis between the PSAA and the IOA is an anatomical structure that is always present in studies in cadavers, it often cannot be identified in imaging studies. This vascular structure is easily visible in imaging studies when its

location is intraosseous, however when it is in contact with the sinus membrane identification is difficult. Moreover, very small-diameter arteries are more difficult to identify in imaging studies. Larger caliber arteries may present a higher risk of hemorrhage during procedures carried out in the region, altering the surgeon's field of view and increasing the possibility of perforating the maxillary sinus. Detailed knowledge of this artery is important for surgical planning in the region.

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METHODS

Search strategy: The search strategy used in PubMed was: (((((((("Cone-Beam Computed Tomography"[Mesh] OR "Spiral Cone-Beam Computed Tomography"[Mesh])) OR CBCT [tiab]) OR Computed Tomography*) OR dissection [tiab]) OR "Dissection"[Mesh]) OR "Cadaver"[Mesh])) AND (((((((alveolar antral artery) OR intraosseous arterial anastomosis) OR extraosseous arterial anastomosis) OR maxillary sinus vascularization [tiab]) OR maxillary sinus vascular anatomy) AND ((course [tiab]) OR diameter [tiab]) OR anatomy*) OR "Anatomy"[Mesh]) OR Prevalence).

Participant or population: Imaging studies carried out in adult individuals.

Intervention: Imaginological studies (CBCT, CT).

Comparator: No comparator.

Study designs to be included: Cross sectional studies.

Eligibility criteria: Studies were included that analysed the presence, location or diameter of the anastomosis between the PSAA and IOA in adult human beings, published in English, Portuguese or Spanish, with no date limits. Original studies that assessed the anastomosis between the PSAA and IOA by imaging examinations were included. Review studies, theses, letters to the editor, case reports and studies carried out in patients with suspected sinus pathology were excluded.

Information sources: The search was carried out in the PubMed, EMBASE and LILACS databases, without date restrictions. In addition, we examined the reference lists of the studies included.

Main outcome(s): - Frequency of the anastomosis between the PSAA and IOA in imaging studies - Most frequent diameter and location of the anastomosis between the PSAA and IOA in imaging studies.

Additional outcome(s): - Analyze the different terms used to name this vascular structure in imaging and cadaver studies.

Quality assessment / Risk of bias analysis: The AQUA tool will be used to evaluate the potential risk of bias across the studies. This instrument have a 20 questions and five domains, which evaluate: 1. objective(s) and subject characteristics, 2. study design, 3. methodology characterization, 4. descriptive anatomy, and 5. reporting of results. The signaling questions are answered as "Yes", "No", or "Unclear". For these signaling questions, "Yes", "No", and "Unclear" indicate low, high, and unclear risk of bias, respectively. On the other hand, the risk-of-bias question is judged as "Low", "High", or "Unclear". If all signaling questions for a domain are answered "Yes", then risk of bias can be judged "Low". If any signaling question is answered "No", this indicates the potential for bias. The "Unclear" option should be used only when the reported data are insufficient to allow for a clear judgment.

Strategy of data synthesis: Random models were used to estimate the frequency and the corresponding 95% confidence interval in the meta-analysis, since the studies were carried out in different populations and with diverse diagnostic methods. Stabilization of the variance in estimations of prevalence was determined by double arcsine transformation. The heterogeneity was estimated by I² (categorized as low, moderate, or high with cut-off values of 25%, 50%, and 75% respectively) and statistics by Chi-squared tests (Chi 2) (statistical significance set at p<0.1). The publication bias was assessed visually by the generation of funnel plots and statistically by Egger's test.

Subgroup analysis: Analysis by subgroups: depending on the n of participants included, region (population assessed), type of imaging examination, diameter, and location of the anastomosis between the PSAA and IOA.

Sensitivity analysis: Studies with a high risk of bias will be omitted from the sensitivity analysis.

Country(ies) involved: Chile.

Keywords: posterior superior alveolar artery, infra-orbital artery, anastomosis, frequency, imaging studies.

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