

The anastomotic network around the anterior superior alveolar nerve: an anatomical and radiological study

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Innervation of superior teeth is supplied by the posterior (PSAN), anterior (ASAN) and sometimes by middle superior alveolar nerve (MSAN). PSAN arises from the maxillary nerve and passes through the posterolateral maxillary wall towards the posterior teeth. ASAN arises from the anterior portion of the infraorbital nerve and courses within the infraorbital canal passing nearby the piriform aperture and premaxilla. When present, MSAN arises from the posterior portion of the infraorbital nerve and runs along the lateral maxillary wall. However, an additional nasopalatine or sublabial injection is frequently required to obtain a complete anesthesia of the maxillary teeth due to rich anastomotic network (1-2). With the aim to better describe the complexity of the superior alveolar nerve network, fifty-seven high-definition sinonasal cone-beam CT (CBCT) were analyzed. PSAN, ASAN and MSAN were detected by specific bony landmarks/canals and nervous anastomoses were accurately evaluated. In addition, medial anastomotic branches from the palatal and/or nasal nervous plexi were also considered. PSAN and ASAN were identified in 100% of cases whereas MSAN in 19.6% of cases. Anastomotic branch versus ASAN was identified in all cases from MSAN and in 60.3% from PSAN. Medial anastomotic branch was detected in 62.0% of cases from the nasal plexus and in 6.2% from the palatal plexus: the former passed through a bony defect in the floor of the piriform aperture or at the base of the nasal septum; the latter passed through a tiny canal in the interface between maxilla and premaxilla. These data confirm that maxillary teeth innervation, especially for incisor teeth, could be provided not only by alveolar nerves but also from palatal and nasal plexi via small branches running within maxillary bony canals. These results support the need of additional anesthetic injection to obtain adequate anesthesia of the maxillary teeth; moreover, the role of CBCT in the identification of the nervous pattern was underlined.

References

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Keywords

Superior alveolar nerve; anastomosis; CBCT.