

THE IMPLICATIONS OF BONY AND SOFT TISSUE ANATOMICAL VARIATION FOR SUCCESS RATES IN MANDIBULAR NERVE (V₃) ANESTHESIA

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Success rates for mandibular nerve anesthesia range broadly (13-98%) depending on the patient, technique employed, and level of practitioner experience. Because experience translates into higher success rates, we suggest experienced practitioners subconsciously modify standard techniques. We tested the hypothesis that mandibular foramen (MF) position is correlated with measures of mandibular size/shape. Such correlations could be the relationships subconsciously identified by experienced practitioners and, when defined, could lead to higher success rates for less-experienced dentists. We also documented the course of the inferior alveolar (IA) nerve relative to the MF.

We measured and made observations on dry mandibles and dissected cadavers. We acquired 3D landmarks from 40 mandibles; this resulted in 25 IA-block-related measurements. Cadaver dissections ($n=40$) were made to provide seven 2D measurements that describe both bony landmarks and the angle and course of the IA nerve.

The correlations between MF position and ramal/mandibular size/shape are extremely weak, and these relationships are too variable for consistent MF localization. From dissections, we found the IA nerve turns medially between the level of the foramen and 1.2 cm above it, and the nerve's anteroposterior angulation above the MF varies by 83°.

Mandibular shape, in general, and IA-block related features, specifically, are highly variable and impose a barrier to successful block. Additionally, we demonstrate that the relationship of the IA nerve to the MF is also highly variable. Of the available landmarks for MF localization, we conclude that only one is useful for anteroposterior localization and suggest a new height landmark.