A reliable landmark for identifying the mandibular foramen in intraoral vertical ramus osteotomy

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The mandibular foramen marks the entry of the inferior alveolar nerve into the mandibular canal, on the medial ramus of the mandible. During the intraoral vertical ramus osteotomy (IVRO) procedure, the ramus of the mandible is approached and cut from its lateral aspect. Hence, a landmark on the lateral ramus is required to estimate the position of the mandibular foramen, enabling the surgeon to make the cut posterior to this point, avoiding potential damage to the inferior alveolar nerve.

The antilingula has been described as a palpable prominence on the lateral ramus, which may be used as a landmark to identify the mandibular foramen. We tested this hypothesis by measuring the 3-dimensional coordinates of the lingula, antilingula and mandibular foramen on 267 dry mandibles (478 sides) by using the MicroScribeG2X (Immersion Corporation, San Jose, CA, USA). In addition, we measured the coordinates of several defined points on the mandible, including the mandibular notch, and the anterior and posterior concavities of the ramus. By comparing the distance of these points from the antilingula and mandibular foramen, we were able to determine the relationship between these two points, thus enabling us to assess the use of the antilingula during the IVRO procedure. Additionally, we were able to compare this relationship between the sexes, and across eight different ethnicities.

All the mandibles in this study are housed in the Duckworth Laboratory at the Leverhulme Centre for Human Evolutionary Studies, and were used by the kind permission of its Director, Dr Marta Mirazon Lahr.