Anatomical landmarks for the localization of the greater palatine foramen in Polish skulls

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INTRODUCTION

Dental procedures involving the hard and soft palates require anesthesia administration to the maxillary division of the trigeminal nerve. This nerve passes through the greater palatine foramen (GPF), thus, it is essential that the foramen be properly identified.

OBJECTIVE

The aim of the present study was to provide multiple anatomical landmarks to aid in the localization of the GPF.

METHODS

Computer tomography (CT) scans of 199 skulls (87 male and 112 female) of patients residing in Cracow, Poland were analyzed using the eFilm Workstation program. Measurements of the distance between the GPF and the incisal (INC), the spina nasalis posterior (SNP), the intermaxillary suture (IMS), as well as the second (M2) and third (M3) molars were made.

RESULTS

On average the left GPF was located 16.87±0.10mm away from the SNP, 35.05±0.25mm away from the INC, and 15.50±0.11mm away from the intermaxillary suture. On the right, the average GPF location was 16.86±0.10mm away from the SNP, 34.83±0.25mm away from the INC, and 16.10±0.11mm from the intermaxillary suture. Of the skulls analyzed, 73.87% had at least one M2 averaging a distance of 11.75±0.19mm from the GPF on the left and 11.60±0.20mm on the right. Meanwhile, 40.2% had at least one M3 with an average distance of 11.75±0.28mm from the GPF on the left and 11.25±0.27mm on the right. Bilaterally, the proximity of the GPF to the molar teeth differed significantly, X²(2, n=77)=17.56, p<0.001 and X²(2, n=75)=18.96, p<0.001 on the left and right respectively. In the majority of skulls, the GPF was located closer to M3 (52.3% on the left and 50.7% on the right). The second most common location was closer to M2 (32.5% on the left and 38.7% on the right) followed by a much smaller proportion located equidistantly between the two molars (14.3% on the left and 10.7% on the right). Bilaterally, male skulls had greater GPF-SNP (p<0.001), GPF-INC (p<0.001), and GPF-intermaxillary suture (p=0.001; p=0.002 right and left respectively) distances than female skulls.

CONCLUSIONS

The utilization of multiple anatomical reference points, such as the incisalure, the intermaxillary suture, and the second and third molars would be useful during dental procedures to ensure proper administration of anesthesia through the GPF.

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