Introduction

The human endolymphatic duct (ED) and sac (ES) run through a bony channel named the vestibular aqueduct (VA). Their functional roles are still uncertain. Pathological changes of the ED and ES have been associated with Meniere’s disease and abnormal dilation of the VA is seen in large vestibular aqueduct syndrome (LVAS) which is associated with sensorineural hearing loss. Morphological reference data and radiological assessments of the VA in LVAS are still somewhat elusive. Here, we analyzed normal size variations in 32 temporal bones and 20 plastic corrosion casts to obtain statistics for assessing normal size variations, limits and optimal radiiological projections.

Materials and Methods

Thirty-two micro-dissected temporal bones were photographed and dimensions assessed using a Zeiss V20 microscope. The outline of the intra-osseous portions were drawn and digitized. Twenty plastic corrosion casts were also analyzed and photographed and the dimensions of the VA were assessed.

Results

The outlines of the micro-dissected VA’s are shown in fig. 1. It shows the extensive variations in the anatomy of the VA. A principal drawing was made to illustrate the anatomy of the VA (fig. 2). The mean width of the external aperture was 6.5 mm with a range from 3.32 mm to 13.50 mm. The mean diameter of the VA at the mid-point between the isthmus and the external aperture was 0.77 mm with a range from 0.54 mm to 1.03 mm. The VA was typically curvilinear in the lateral and the axial plane and the proximal and distal portions were not always seen in the same axial plane.

Conclusion

In this study we aimed at analyzing the normal human VA to assess its variability and to make recommendations for radiological projections. The anatomical variations of the distal part of the VA have been shown to be substantial, therefore the proximal part may be the most appropriate part to analyze. Based on the curved, J-shaped course of the VA through the otic capsule it is not always seen in the same axial plane and we recommend both axial and lateral projections for assessing dilations on CT scans.

References

Veisjarassu GE, Oinas DJ. The Large Vestibular Aqueduct Syndrome. Laryngoscope, 1978;88: 720-26
