

## **Evaluation of Pyriform Aperture Morphometric Measurements in Sex Determination among Sri Lankan Adult Population Using Computed Tomography**

S. Subendran, G.K. Dharmaratne\*, M. Srivany, T.M.D.N. Thennakoon, M.G.R.S. Perera

*Department of Radiography/ Radiotherapy, Faculty of Allied Health Sciences,  
University of Peradeniya, Peradeniya, 20400, Sri Lanka  
\*kanishka@ahs.pdn.ac.lk*

Sex determination using human skull has a huge impact in forensic medicine in identification of unknown individuals. The shape and contour of Pyriform Aperture (PA) exhibits sexual dimorphism. The use of Multi-Detector Computed-Tomography (MDCT), combined with post-processing techniques, offers high-resolution images which significantly improve the accuracy of analyses of PA. The aim of this study was to evaluate the morphometric dimensions of PA in male and female Sri Lankan adult population using MDCT. A retrospective, descriptive study was conducted on 396 adult patients (198 females, 198 males) who underwent MDCT scans of brain and paranasal sinus (PNS). Images were obtained from nine hospitals representing nine provinces in Sri Lanka and were subjected to Volume Rendering (VR) reconstruction technique using RadiAnt DICOM viewer. Reconstructed images were used in obtaining width of PA (PAW) and height of PA (PAH). Pyriform Aperture Index (PAI) was calculated using PAW and PAH (PAW/ PAH). All the measurements were evaluated between the male group and the female group. All the data were analyzed using SPSS 25.0. The calculated mean values of PAH, PAW and PAI among males were 2.837 cm, 2.423 cm and 0.863 respectively, whereas in females, the mean value of PAH, PAW and PAI were 2.639 cm, 2.345 cm and 0.895 respectively. Mann-Whitney U test revealed a significant difference between the sex for all the parameters ( $p < 0.05$ ). Further this study showed that the pyriform aperture height and width were higher in males than in females, with significant differences. ( $p$  values obtained: PAH = 0.000, PAW = 0.009, PAI = 0.000). PA morphometry could be utilized for sex determination, in forensic and anthropological contexts due to its distinct sexually dimorphic characteristics. It is also essential for surgical applications such as nasal reconstructive procedures including rhinoplasty, septoplasty, thus enhancing surgical precision and outcomes.

**Keywords:** MDCT, pyriform aperture, morphometry, sex determination