ABSTRACT

Background:

Ameloglyphics is the study of enamel rod end patterns. Enamel rod end patterns are unique for every individual. Enamel rod end patterns in male and female can be studied by cellulose acetate peel technique. Teeth can withstand extreme temperatures and are resistant to post-mortem decay. Thus it can be used as an evidence to identify sex of an individual from badly burned, traumatized, decomposed and skeletonised remains in mass disasters. Ameloglyphics is a simple, inexpensive and rapid method.

AIM:

To study the utility of enamel rod patterns in identification of gender in forensic odontology

OBJECTIVE:

- To study the enamel rod end patterns of teeth extracted from 100 individuals (N=100)
- To compare the enamel rod end patterns of extracted teeth between males (n=50) and females (n=50).

HYPOTHESIS:

There is no difference between enamel rod end patterns of teeth between sex.

MATERIALS AND METHODS:

In this study, 100 extracted teeth were collected, of which 50 are from males and 50 are from females. The selected teeth were scaled and polished. The selected area was conditioned with 37% orthophosphoric acid for 20 seconds. Then it was rinsed with water and dried. A

drop of acetone was applied on to the tooth surface and was covered by a small piece of cellulose acetate film and left undisturbed for 20 min. The acetone dissolves a layer of cellulose acetate and the dissolute settles down along the irregularities on the enamel surface. The film was gently peeled after 20 min and observed under light microscope. A photomicrograph of the acetate peel was obtained at 40X magnification and then subjected to biometric analysis using Verifinger standard SDK version 10.0 software (NEUROtechnology). The software recognizes the patterns of enamel rod endings as series of lines running in varying directions. The software uses certain points called minutiae for identification of each pattern. These minutiae will be used by the software to compare the similarity/variability of two patterns[3].

Results: Enamel rod pattern was unique for each individual. There was significant difference in the age in wavy and linear unbranched pattern. There were seven enamel rod patterns seen- wavy, linear branched, linear unbranched, loop, whorl close, whorl open and stem pattern. Though there were overall differences within in the patterns in incisors, canines, premolars and molars, it was not significant to distinguish between the gender.

Conclusion: Enamel rod pattern could help in personal identification when there is pre-recorded information of the same. To understand the the utility of ameloglyphics in sex determination, more studies are needed with a larger sample size and further software validation.

Key words: Enamel rod end pattern, Verifinger SDK 10, Cellulose acetate peel technique