Hunter schreger bands and enamel rods under polarized and light microscopy

Keywords: microstructure, prism, rod, dark and light bands, polarized microscopy

Introduction

Enamel is the hardest tissue in the body covers the crowns of teeth. The microstructure of enamel is intricate, to withstand masticatory forces. As per literature enamel is composed of inorganic and organic material. The basic structural unit of enamel is the ‘prism’ or ‘rod’, which is composed of hydroxyapatite crystals arranged specifically to enhance the mechanical properties. In cross section, the Enamel. Rods have composed of rounded head or body and a tail (look like key holes) forming a repetitive series of interlocking prisms; rounded head of each prism (rod) lies between the narrow tail portions of 2 adjacent prisms

Each prism runs A wavy course from near the DEJ (dentin enamel junction) to enamel surface and the paths undertaken by enamel prisms, including any decussations or bending, reflect the movements of the ameloblasts that form them during amelogenesis. It has previously been proved that, under reflected light longitudinally section of enamel shows an alternating series of dark and light bands. These features are called Hunter-Schreger Bands (HSBs) postulated that it was an optical phenomenon related to the changes in the path of enamel prisms as they travel from the DEJ to the enamel surface. It has also been suggested that the appearance of HSBs is related to the synchronous decussation of enamel prisms in the horizontal plane and is probably caused by reflection of light by inter-prismatic material.

Enamel is made up of 3 structures: rods or prisms, rod sheaths and interred substance. Each Rod (Prism) is consist of millions of hydroxyapatite crystallites. Each rod is formed by four ameloblasts. The boundary between rod and interrod enamel is marked by a narrow space filled with organic materials known as rod sheath. Various authors have studies Hunter Schreger bands in a different teeth. Very few empirical data are available regarding enamel rods under light microscopy and polarized microscopy. Therefore, authors attempted to visualize enamel rods under light microscopy and polarized microscopy.

Methods

This study was conducted at D.Y Patil University, School of Dentistry Nerul Navi Mumbai. Ground section was prepared and was mounted on a glass slide using DPX. The specimen was examined under reflected light, transmitted light and polarized light. The slides were then observed under Leica Research microscope Model No. DM1000LED with Leica Image analysis software (Version 3.8.0) under ×4, 10x and 40x objective lens. Observations are revealed in figures that are related to present study (Figure 1–5).

Conclusion

Normal histology of enamel has been studied under light and polarized microscopy. New techniques should be developed in future to visualize decalcified thin sections of enamel with intact enamel rods structure and to visualize them in a better way.
Acknowledgements

None.

Conflict of interest

Author declares that there is no conflict of interest.

References


