HISTOLOGICAL AND RADIOGRAPHIC FOLLOW-UP OF THE AGE CHANGES IN MANTLE AND CIRCUMPULPAL DENTIN

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Dedication

To the soul of my parents who gave me more than I needed to be here today. The words cannot express my feelings without them.

To my dear husband Mohammed and my daughter Noreen for giving me all love, time and support that I needed, may Allah bless them for me

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●µm	micrometer
●AL-step wedge	Aluminium step wedge
●Ca	Calcium
●CDJ	Cementodentinal junction
●CP.D	Circumpulpal dentin
●d.t	Dead tracts
●D.T	Dentinal tubules
●DEJ	Dentinoenamel junction
●DPP	Dentin Phosphoprtein
●DSP	Dentin Sialoprotein
●EDTA	Ethylene diamine tetra acetic Acid
●Fig.	Figure
●GAG	Glycosaminoglycans
●gp	Group
●GS	Ground section
●GT	Giant tubules
●H&E	Haematoxylin and Eosin

- hrs Hours
- IGD Interglobular dentin
- ITD Intertubular dentin
- Kv Kilovoltage
- mA milliamber
- MD Mantle dentin
- mm millimeter
- NCP Non-collagenous proteins
- P Phosphorous
- PTD Peritubular dentin
- R Reparative dentin
- SEM Scanning Electron Microscope
- TEM Transmission Electron Microscope
- TLM Transmitted light microscope

INTRODUCTION

Dentin is the most voluminous mineralized connective tissue of the tooth that forms the hard tissue portion of the dentin-pulp complex, whereas the dental pulp is the living soft tissue portion.

By weight, mature dentin is made up of approximately 70% inorganic material, 20% organic materials and 10% water. The inorganic component consists of hydroxyapatite plate like crystals and trace elements such as carbonate, lead and fluorine may also be present. The organic matrix consists of collagen fibers mostly type I, in addition to phosphoproteins, lipids, glycoproteins and proteoglycans **(Tencate 2003)**.

Primary dentin is that type of dentin which formed till complete root formation. Thus, the tooth mass principally consists of primary dentin

that outlines the pulp chamber, and commonly referred to as circumpulpal dentin. The outermost layer of the coronal primary dentin, just under the enamel, is a narrow zone called mantle dentin .It is a product of the newly differentiated odontoblasts, and has slightly different composition than circumpulpal primary dentin **(Torneck 1994)**.

Dental hard tissues -including dentin- continuously show ultrastructural changes as a consequence of aging process **(Pretty 2003)**.

REVIEW OF LITERATURE

Organic matrix of dentin

The dentin organic matrix primarily consists of fibrous collagens and other proteins as, phosphoproteins and phospholipids. The matrix provides a framework for mineralization. Collagens comprise 90% of the dentin matrix, and are principally type I collagen **(Gage JP. 1984, Lukinmaa et al. 1992)**. Type I collagen is composed of 2 identical α 1 chains synthesised as a large procollagen, which contains extentions at both the N- and C-terminal ends, called the aminoterminal and carboxyterminal propeptides, which prevent premature collagen aggregation into fibrils. After procollagen secretion extracellularly, extracellular modification takes place, and propeptides are removed by specific proteinases and mature collagen molecules