暫間受力對牙周硬組織的影響—雷射掃描共軛焦顯微鏡的觀察

Effects of Transient Load on Periodontal Hard Tissue-Confocal Laser Scanning Microscope Obeservation

中文摘要

牙周組織與外力的關係，自 20 世紀初至今，諸多研究報告中，由於研究中施予外力的大小、次數、方向與時間等的不同，所得的結果亦不盡相同，而多所爭論。本實驗以 50mm/min 的速度、1.5Kg 的單次固定軸向的力量，施予 60 雙 12 周齡 S/D（Spraque-Dawley）雄性大白鼠的健康上下顎左側第一大臼齒，並以右側第一大臼齒則作爲對照組。實驗動物在受力後第 1、3、7、14、21 日屠殺，在屠殺前 5 日注射 Calcein 作硬組織標記，試料在酒精固定、Villanueva bone stain 染色、脫水、包埋、製作成厚片後以螢光顯微鏡、雷射掃描共軛焦顯微鏡觀察，以了解暫間受力對齒槽骨、牙骨質等之牙周硬組織代謝的影響。實驗結果發現牙齒在受力後 1、3 日，齒頸部牙根周圍可見明顯的牙骨質與齒槽骨破壞，並於受力後 7、14 可見明顯的新生牙骨質與齒槽骨沈積，在第 21 日這再生現象則漸不明顯。其中，上顎骨可見較下顎骨爲快的新生骨形成的現象。對照組牙周硬組織則在實驗期間呈現均勻而平滑的螢光反應分布。可知，經由硬組織標定，螢光與雷射掃描共軛焦顯微鏡觀察可以了解外力對牙周硬組織的影響與其組織變化情形。牙周硬組織則在受力後初期有明顯的破壞吸收，經時觀察後則可見逐漸修復再生的現象，並於組織再生後進入與對照組相似的正常代謝狀態。　　牙周組織與外力的關係，自 20 世紀初至今，諸多研究報告中，由於研究中施予外力的大小、次數、方向與時間等的不同，所得的結果亦不盡相同，而多所爭論。

英文摘要

The influence of the transient and strong load on periodontium was investigated. The age of 12 weeks old of sixty Sprague-Dawley rats were used as experimental animals. The left upper and lower first molars of each rat were loaded with a transient force of 1.5 kg used for experimental, but the contra-lateral first molar was served as the control. On the 12th hours, 1st, 3rd, 7th, 14th, 21st days the rats were harvested while they had been injected with the fluorescent calcein (10 mg/kg) before five days. The specimens were removed and then immersed by Villanueva bone stain for fluorescent and confocal laser scanning microscope observations. The results showed that the cervical portions of the tooth and alveolar bony crest were destroyed by transient load on 1st and 3rd days. New bone and new cement were formed on 7th and 14th days. The upper arch of new bone formation seems to be faster than lower arch. The above structural changes of the periodontal hard tissues explained the periodontium even loaded by transient and strong force still has repair

function.