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• 計畫英文名稱	Effect of the Transient Load Periodontium		
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• 中文關鍵字	暫間受力；牙周組織；外傷性咬合；穿透式電子顯微鏡；掃描電子顯微鏡		
• 英文關鍵字	Transient loading force；Periodontal tissue；Traumatic occlusion；Transmission electron microscopy (TEM)；Scanning electron microscopy (SEM)		
• 中文摘要	<p>牙周組織因外力造成的變化,由於外力的大小、次數、與受力時間等因素,諸多的研究結果皆不盡相同,仍有許多爭議之處。本實驗利用光學顯微鏡和掃描式電子顯微鏡等形態學研究方法,觀察牙周組織即牙齦、牙周韌帶、齒槽骨和牙根面牙骨質,在受到單次而強大的外力後,局部組織結構的變化。本實驗在 54 隻 12 週齡 SD 雄性大白鼠之左側第一大臼齒上,施予單次 1.5 公斤短暫而強大的力量。右側第一大臼齒則不施力作為對照組。實驗動物分成兩組,分別是 36 隻的光學顯微鏡觀察組,和 18 隻的掃描式電子顯微鏡觀察組。前者分別在施力後 12 小時、1 天、3 天、7 天、14 天、21 天,以 Bouin 氏液灌流固定、製作試料與石臘切片,並於 H&amp;E 染色後,以光學顯微鏡觀察。後者則於相同實驗間隔,以 2.5%戊二醛灌流固定後,注入樹脂,經過後固定、脫水、乾燥、與鍍金的處理後,以掃描式電子顯微鏡進行觀察。結果發現,施力後十二小時的牙齦組織中可見多量的發炎細胞聚積,施力一天後達最多,之後隨時間漸減,至施力十四天的標本則不復見發炎細胞的大量聚積。同時,施力後十二小時亦可見接合上皮的細胞間隙有變大的現象。齒槽骨則在施力後第一天,可見骨吸收性細胞存在於骨吸收陷窩內,第七天時吸收破壞最嚴重,可見到許多骨吸收性細胞。而十四天仍可見骨吸收陷窩存在,二十一天時,齒槽骨上可見許多捲曲、圓鋸狀的接合線。至於牙周韌帶則在受力後第三天,可見夏庇氏纖維聚集成束狀,其方向為平行於牙齒長軸,之後隨時間漸被骨基質包埋。牙根表面在齒頸部自受力後十二小時即可見受力牽引破壞的現象,第三天的吸收破壞最為嚴重,局部可見許多吸收性多核巨細胞的存在。但在受力後第十四天牙根表面已不復見吸收性細胞的存在,呈現基質開始沈積和修復的現象。由觀察結果可知,暫間受力會使健康的牙周組織,包含牙齦、齒槽骨、牙周韌帶與牙根表面牙骨質產生結構上的變化,特別是位於齒頸部靠近齒槽骨脊的牙周組織變化最為明顯,但若無持續的刺激,這些變化是可以回復的。</p>		

- 英文摘要

The influence of transient and strong load on periodontium was investigated. Fifty-four Sprague-Dawley rats at the age of 12 weeks old were used as experimental animals and divided into 2 groups. The left first molar of each rat was loaded with a transient force of 1.5Kg, and the contra-lateral first molar served as the control. On the 12th hours, 1st, 3rd, 7th, 14th and 21st days, 6 rats of each group were harvested. The specimens were sectioned, H-E stained and observed with light microscopy. Another 3 rats were perfused with Ringers' and fixed with 2.5% glutaraldehyde followed by injection with methacrylate, post-fixation, dehydration, ion-coating, and then observed with scanning electron microscopy. The results showed increase of intercellular space in junctional epithelium on the 12th hours. On the 1st day, numerous inflammatory cells were noted in gingival tissue. On the 3rd, 7th days, the exposed Sharpey's fibers aggregated as long-clustered shape paralleling the tooth axis on the alveolar socket wall. There were lots of Howship's lacunae and multinuclear giant cells present in alveolar bone and tooth surface, especially in the cervical part. On the 14th days, matrix deposition on the root surface could be seen. A high number of crenated cement lines were observed in the alveolar bone on the 21st days. Sharpey's fibers were embedded in newly formed bony matrix, indicating the remodeling was in progress. The observations demonstrated that transient and strong load resulted in the structural changes of the periodontal tissues, especially the area near the cervical part of teeth. The changes were reversible.