P-14 Nd:YAG 레이저의 조사방법의 차이에 따른 상아세관 폐쇄 효과에 관한 주사전 현미경적 연구

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Dentin hypersensitivity must be a most frequent postoperative complaint of periodontal patients. The relationship between dentin hypersensitivity and the increased number of opened dentinal tubules has been established. Obliterating opened dentinal tubules or reducing the number of opened tubles or decreasing the diameter of their orifices would, therefore, be an objective of treatment for hypersensitive teeth.

The purpose of this study was to evaluate the effect of a pulsed Nd:YAG laser irradiation on obliteration of dentin tubules and to determine the most effective irradiation method.

The 45 posterior teeth that had been extracted due to periodontal disease were initially treated with tetracycline HCl(100㎎/㎖, 5 min.) to remove the smear layer after root planing. The root surfaces were then irradiated by a pulsed Nd:YAG laser (EL.EN.EN060, Italy)by different laser beam spot size and different exposure condition;

group 1: small spot size group (1㎜), 1W, 2 sec.
group 2: large spot size group (10㎜), 1W, 200 sec.
group 3: group of gradual increase of watt (from 0.3 W to 1.0 W).
group 4: group of fixed watt (1.0 W)
control group: root planing and tetracycline HCl.

Additionally, the specimens were retreated with tetracycline HCl (100㎎/㎖, 5 min.) to evaluate the stability of obliteration effect by Nd:YAG laser.

Specimens were examined under the scanning electron microscope (JEOL, JSM-840A, Japan). Photomicrographs were taken at x 4,000 magnification and were analyzed statistically.

The results were as follows;

1. Scanning electron micrographs of root surface treated by tetracycline HCl alone showed

widened, funnel-shaped dentinal tubules, while those of the root surface irradiated by various methods showed partially or completely obliterated dentinal tubules and various surface alterations, eg, flat, multiple pitted, melted and resolidified surface at the same energy density.

2. The obliteration effect of dentinal tubules was significantly higher in the small (1㎜) spot size group than the large (10㎜) spot size group ($P < 0.001$).
3. There was no significant difference in the obliteration effect of dentinal tubules between group of gradual increase of watt(from 0.3 W to 1.0 W) and group of fixed watt (1.0W) ($P<0.05$).
4. The obliteration effect of dentinal tubules by a Nd:YAG laser irradiation was relatively stable to tetracycline HCl.

The results suggest that a pulsed Nd:YAG laser irradiation may effectively obliterate dentinal tubules.