COMPARISON OF PULPAL RESPONSE FOLLOWING PULPOTOMY PROCEDURE USING ENAMEL MATRIX DERIVATIVE VERSUS FORMOCRESOL IN PRIMARY DENTITION

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ABSTRACT

The aim of the present study was to compare the clinical, radiographical and histological effect of enamel matrix derivative (Emdogain®) versus formocresol on pulpotomized human primary teeth.

Clinical follow-up of formocresol treated teeth at 2 months revealed (93.3%) clinical success rate. Only one tooth suffered from pain and was sensitive to percussion in formocresol group. This dropped to 86.7% at 4 months. At 6 months five teeth showed pain and pain on percussion clinically lowering the clinical success rate to 66.7%. Emdogain® showed an overall clinical success rate of 100% at 2 & 4 months. Only one tooth was reported with pain on percussion at 6 months reducing the clinical success rate to 93.3%. All teeth (100%) were free from mobility, abscess formation or draining sinus at 2, 4 & 6 months among both Formocresol and Enamel Matrix Derivative (Emdogain®) tested groups. Radiographically in Formocresol group, eleven teeth (73.3%) showed no pathological signs at 2 months recall. The radiographic success rate dropped to four teeth (26.7%) at 4 months recall. Two teeth only (13. 3%) were still free at 6 months recall. Emdogain® group showed radiographic success rate of 86.7% representing thirteen free teeth. This succes rate dropped to ten teeth (66.7%) at 4 months follow-up. Nine teeth (60%) were still frees of pathological signs at 6 months. Histological evaluation seemed far more promising for Emdogain® than formocresol. When the pulp wound was exposed to EMD, a substantial amount of reparative dentin-like tissue was formed in a process much resembling classic wound healing with moderate inflammatory infiltrate beneath the injury with subsequent increase in angiogenesis of normal pulp tissue.

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At later stages, a fine web of odontoblast-like cells was also observed growing from the central parts of the pulp towards the pulp chamber walls forming a dentin bridge. The EMD induced hard tissue closely resembled osteodentin early in the process, but later on the hard tissue became more like the secondary dentin. On the contrary, the severe chronic inflammation of pulp tissue acccompained with formocresol eventually produced pulp necrosis with or without fibrosis and incomplete dentin bridging at terminal stages in some cases.

Based on the present findings, it may be concluded that Emdogain® is a bio-inductive material that is compatible with vital human tissues. It offers a good healing potential and is capable of inducing dentin formation, leaving the remaining pulp tissue heathy and functioning.