

Intracanal bisphosphonate does not inhibit replacement resorption associated with delayed replantation of monkey incisors.

Article type: Article

Abstract:

Progressive replacement resorption following delayed replantation of avulsed teeth has proved to be an intractable clinical problem. A wide variety of therapeutic approaches have failed to result in the predictable arrest of resorption, with a good long-term prognosis for tooth survival. Bisphosphonates are used in the medical management of a range of bone disorders and topically applied bisphosphonate has been reported to inhibit root resorption in dogs. This study evaluated the effectiveness of a bisphosphonate (etidronate disodium) as an intracanal medicament in the root canals of avulsed monkey teeth, placed before replantation after 1 h of extraoral dry storage. Incisors of six *Macaca fascicularis* monkeys were extracted and stored dry for 1 h. Teeth were then replanted after canal contamination with dental plaque (negative control) or after root canal debridement and placement of etidronate sealed in the canal space. A positive control of calcium hydroxide placed 8-9 days after replantation was also included. All monkeys were sacrificed 8 weeks later and block sections were prepared for histomorphometric assessment of root resorption and periodontal ligament status. Untreated teeth showed the greatest extent of root resorption (46% of the root surface), which was predominantly inflammatory in nature. Calcium hydroxide treated teeth showed the lowest overall level of resorption (<30% of the root surface), while the bisphosphonate-treated group was intermediate (39%). Ankylosis, defined as the extent of the root surface demonstrating direct bony union to both intact and resorbed root surface, was the lowest in the untreated control group (15% of the root surface), intermediate in the calcium hydroxide group (27%) and the highest in the bisphosphonate group (41%). Bony attachment to the tooth root was divided approximately equally between attachment to intact cementum and to previously resorbed dentin. Overall, bisphosphonate resulted in a worse outcome than calcium hydroxide in terms of both root resorption and ankylosis.

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