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Comparative evaluation of impact resistance of simulated immature teeth during regenerative endodontic procedure, long-term Ca(OH)2 therapy and MTA plug apexification following by fiber post placement

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The aim of this study is comparative evaluation of cervical fracture resistance of simulated immature teeth during three types of above-mentioned procedures including long-term Ca(OH)2 therapy, MTA plug apexification with fiber post placement and regenerative endodontic procedure. A total of 80 maxillary teeth were randomly placed into three experimental groups (n=20) and two negative and positive control groups (n=10). Teeth in the experimental groups and the positive control group were instrumented using ProTaper Rotary system (SX to F5). Simulation of roots into immature teeth was performed using Peeso Reamer (size 1 to 6), retrogradely. Teeth in each experimental group were treated by long term Ca(OH)2, MTA plug with fiber post or regenerative endodontic procedure. Enlarged canals were remained empty in positive control group and no instrumentation was performed on the samples in the negative control group (intact teeth). The specimens were submitted to Charpy impact testing (0.5 mm/min at 90° relative to the long axis of the tooth) and data were subjected to one-sample Kolmogorov-Smirnov test and Tukey's tests (α=0.05). Impact resistance of specimens in negative control group was significantly higher than that of other groups. There was no significant difference among impact resistance of samples in the other groups (three experimental group and positive control group). Impact resistance of immature teeth during the long-term Ca(OH)2 therapy, regenerative endodontic procedure and apexification using MTA plug with fiber post are not significantly different and is not significantly higher than those of teeth with empty canals.

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