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**EVOLIUCINĖ MEDICINA:  
ŽMOGAUS RAIDOS PERSPEKTYVOS IR SVEIKATA  
BESIKEIČIANČIOJE APLINKOJE**

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**EVOLUTIONARY MEDICINE:  
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CONSEQUENCES IN A CHANGING ENVIRONMENT**

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# ACCURACY OF DYNAMIC NAVIGATION FOR FIBER POST REMOVAL: AN IN VITRO STUDY

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**Background and Aim:** Fiber post removal is a technically challenging procedure. Novel technologies have been introduced to improve the safety of fiber post removal. The aim of this study was to evaluate the accuracy of fiber post removal using dynamic navigation (DN).

**Materials and Methods:** Twenty-eight 3D printed maxillary central incisors underwent root canal treatment and were restored using fiber posts cemented with self-adhesive resin cement. Core build-ups were completed with fiber reinforced composite resin. Preoperative and postoperative cone-beam computed tomography (CBCT) scans were acquired. Drilling paths and preparation depths were virtually planned using the DN software system, and fiber post removal was performed under DN guidance. Accuracy was evaluated by comparing the planned and actual access cavity trajectories on CBCT images. Entry point deviation, apical 3D deviation, apical depth deviation, and angular deflection were calculated to assess accuracy. The preparation time and total DN procedure time were recorded. Data were analysed with significance set at  $p < 0.05$ .

**Results:** The mean entry point deviation was 1.16 mm ( $\pm 0.07$ ), apical point 3D deviation 1.40 mm ( $\pm 0.09$ ), apical point depth deviation 0.49 mm ( $\pm 0.09$ ), and angular deflection 2.42 ° ( $\pm 0.24$ ). The mean preparation time was 150.32 s ( $\pm 52.09$ ), while the total DN procedure time was 9.79 min. ( $\pm 1.99$ ). The total DN procedure time for the first third of specimens was significantly longer than for the second ( $p = 0.001$ ) and third ( $p < 0.001$ ) thirds. No statistically significant difference was observed between the second and third thirds ( $p = 0.529$ ).

**Conclusions:** Dynamic navigation demonstrated high accuracy for fiber post removal under in vitro conditions. However, a learning curve is evident, indicating that training is required to optimise procedural efficiency.

**Keywords:** dynamic navigation, guided endodontics, post removal