

The Effect of Implant Adjacency on Fracture and Loss of Endodontically Treated Teeth

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INTRODUCTION

Background

Previous studies have suggested a possible association between root fractures in endodontically treated teeth and their adjacency to dental implants.

Purpose

This retrospective study aimed to investigate the effect of implant adjacency on endodontically treated teeth.

MATERIALS AND METHODS

A total of 787 patients with an average follow-up of 57.1 months were examined to define the tooth loss, cumulative survival rate, and odds ratio (OR) for endodontically teeth adjacent versus nonadjacent to implants. Chi-square tests were employed to assess the tooth loss comparing endodontically treated teeth and implant adjacency. To investigate how different tooth types including incisors, canines, premolars, and molars affect the tooth loss, binary logistic regression analysis was employed.

RESULTS

A total of 213 endodontically treated teeth adjacent to implants and 906 non-adjacent to implants were included.

Teeth Adjacent to Implants with Endodontic Treatment

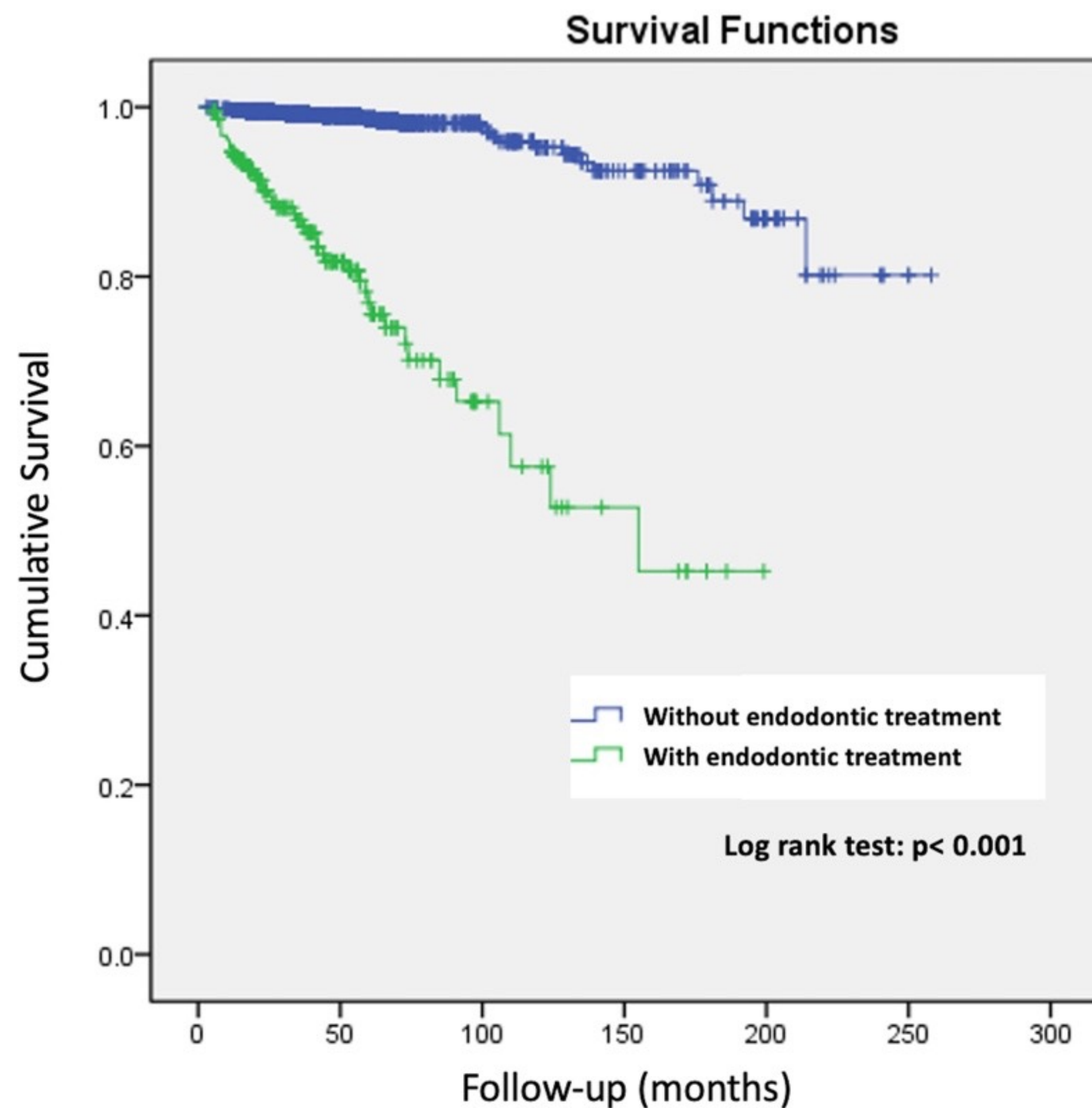
A significantly higher risk of tooth loss due to fracture compared to those adjacent to implants without endodontic treatment was found. (Odds ratio, OR = 15.151, $p < 0.001$).

Tooth Types

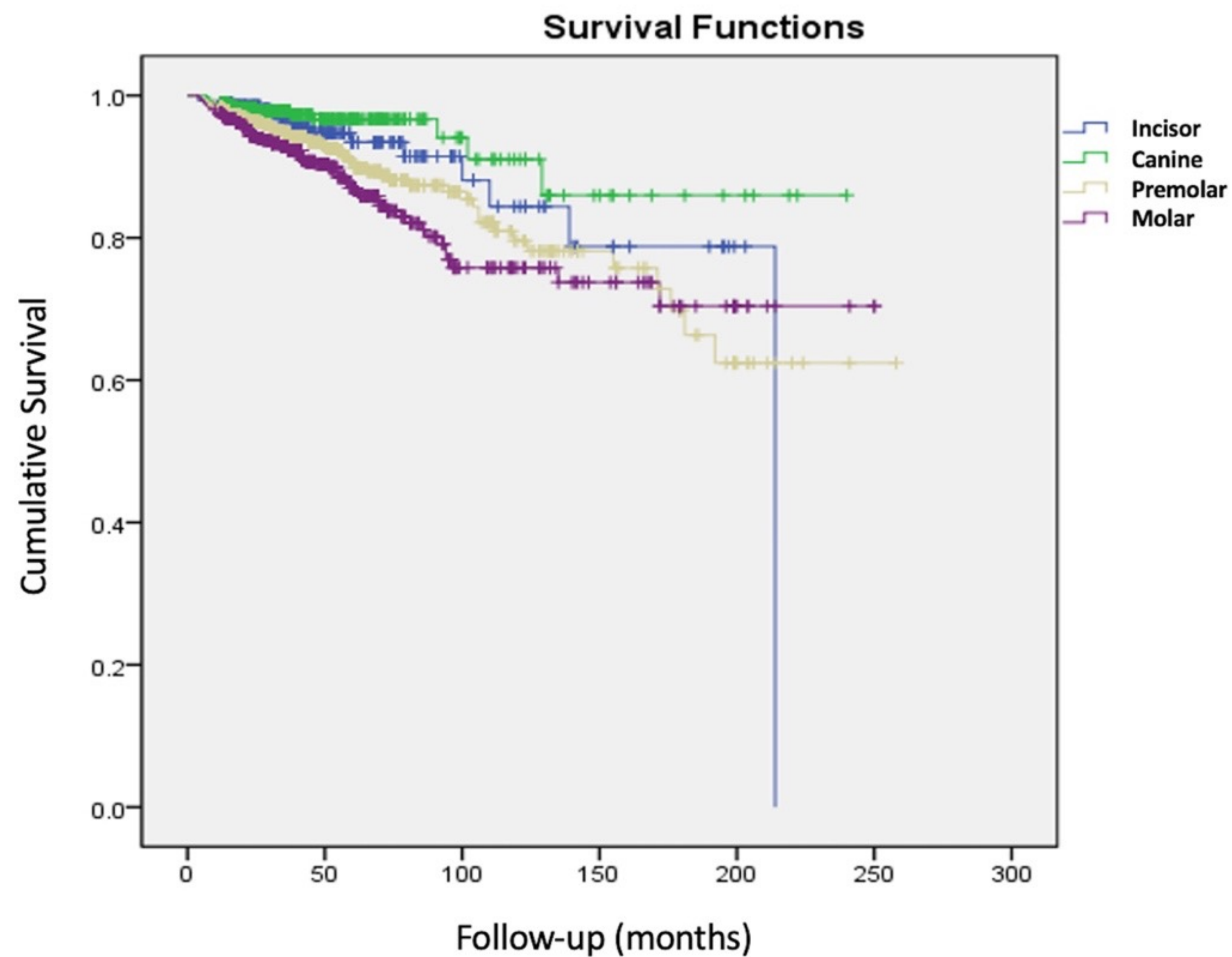
The risk of tooth loss due to fracture was similar across all tooth types.

Endodontically treated teeth Adjacent versus Non-adjacent to Implants

The risk of tooth loss due to fracture was significantly higher for those adjacent to implants compared to non-adjacent endodontically treated teeth, with a risk rate of 26% (CI: 18.98% to 33.12%, $p < 0.0001$)



Kaplan-Meier survival plot for adjacent teeth with and without a history of endodontic treatment



Kaplan-Meier survival plot for adjacent endodontically treated teeth, grouped by tooth type

Tooth type	Incisor	Canine	Premolar	Molar
Adjacent teeth loss due to root fracture	4 (12.12%)	4 (18.18%)	18 (20.93%)	18 (25%)
Total number of adjacent teeth	33	22	86	72
Nonadjacent teeth loss due to root fracture	3 (1.97%)	0 (0%)	7 (2.31%)	8 (1.99%)
Total number of nonadjacent teeth	152	49	303	402

CONCLUSIONS

The present study demonstrated that after patients received dental implant treatment, teeth adjacent to implants with endodontic treatment showed a 15.2-fold higher risk of tooth loss due to fracture compared to those without endodontic treatment. There is a higher risk of tooth loss due to fracture for endodontically treated teeth adjacent to implants compared to those non-adjacent to implants.

Clinical Implications:

- Clinicians should be mindful of patients' chewing habits after implant placement. Careful monitoring of occlusion and periodic occlusal adjustments are essential to avoid excessive occlusal force on one specific site.
- Clinicians should exercise caution when selecting patients for implant therapy
- The use of occlusal splints may not only protect implants but also safeguard endodontically treated teeth, particularly in patients with parafunctional habits.

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