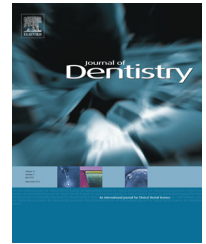


Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.intl.elsevierhealth.com/journals/jden](http://www.intl.elsevierhealth.com/journals/jden)

## Longevity of class 2 direct restorations in root-filled teeth: A retrospective clinical study

N. Scotti<sup>a,\*</sup>, C. Eruli<sup>a</sup>, A. Comba<sup>a</sup>, D.S. Paolino<sup>b</sup>, M. Alovisi<sup>a</sup>,  
D. Pasqualini<sup>a</sup>, E. Berutti<sup>a</sup>

<sup>a</sup>University of Turin Dental School, Department of Surgical Sciences, via Nizza 230, 10126 Turin, Italy

<sup>b</sup>Department of Mechanics, Politecnico di Torino, Turin, Italy

### ARTICLE INFO

#### Article history:

Received 26 September 2014

Received in revised form

22 January 2015

Accepted 9 February 2015

#### Keywords:

Post-endodontic restoration

Direct restoration

Longevity

Posterior teeth

Fibre post

### ABSTRACT

**Objectives:** To evaluate retrospectively the longevity of endodontically treated teeth restored with direct resin composite without cusp coverage, with or without the insertion of fibre posts. The null hypothesis was that direct restorations with fibre posts perform better than those without fibre posts.

**Methods:** Patients recruited for this study were treated in the Department of Cariology and Operative Dentistry, University of Turin, between 2008 and 2011. In total, 247 patients with 376 root treated posterior teeth, restored with direct resin composite, were recalled for a control visit. Only second-class cavities were considered. Two groups were defined based on the absence (Group A) or presence (Group B) of fibre post. Failures and complications, such as periodontal failure, endodontic failure, tooth extraction, root fracture, post fracture, post debonding, replacement of restoration, crown displacement, and coronal-tooth fracture, were noted. Functional restoration quality was evaluated following the modified USPHS criteria. Data were evaluated statistically with ANOVA.

**Results:** Group A consisted of 128 patients with 178 restorations (88 premolars, 90 molars) with a median follow-up of 34.44 months. Group B consisted of 119 patients with 198 teeth (92 premolars, 106 molars) with a median follow-up of 35.37 months. Direct restorations with fibre posts were statistically significantly more functional (95.12% success) than those without fibre posts (80% success) because of less marginal discolouration, better marginal integrity, and higher restoration integrity.

**Conclusions:** The null hypothesis was accepted because direct post-endodontic restorations with fibre posts performed better than restorations without posts after 3 years of masticatory function.

**Clinical significance:** An evaluation of the longevity of post endodontic direct restoration would seem to enhance the fiber post insertion within a composite restoration to reduce clinical failures.

© 2015 Elsevier Ltd. All rights reserved.

\* Corresponding author at: Via Nizza 230, 10100 Turin, Italy. Tel.: +39 340 2861799; fax: +39 011 6620602.

E-mail address: [nscotti@unito.it](mailto:nscotti@unito.it) (N. Scotti).

<http://dx.doi.org/10.1016/j.jdent.2015.02.006>

0300-5712/© 2015 Elsevier Ltd. All rights reserved.

## 1. Introduction

Root canal treated teeth show alterations in biomechanical and neuro-receptive behaviours in comparison with vital teeth. Loss of pulpal tissue causes dehydration,<sup>1</sup> demineralisation,<sup>2</sup> collagen alterations, and proprioceptor reduction.<sup>3</sup> Many studies of the biomechanical analysis of vital and non-vital teeth have shown unanimously that the amount of residual tissue is the most important factor related to resistance to masticatory loads.<sup>4,5</sup> Architectural changes related to primary causes leading to endodontic treatment, such as caries or fracture for trauma with loss of the marginal ridge<sup>5</sup> and cusp thickness reduction,<sup>6</sup> or clinical procedures necessary to perform endodontic treatment such as removal of the demineralised anatomical portion of the tooth crown and the pulp chamber roof,<sup>5</sup> are the real intervening factor in reducing structural resistance of root canal treated teeth. The direct clinical consequence of these biomechanical alterations is an increase in vertical and corono-radicular fractures under gingival margins, compared with vital teeth.<sup>7</sup>

To confirm the theory, previous retrospective studies concluded that MOD restorations, in particular those in amalgam, are associated with the highest risk of fracture in root canal treated teeth.<sup>8</sup> This is why complete cusp coverage is considered the gold standard therapeutic approach for MOD cavities in root canal treated tooth.<sup>9</sup> Among teeth types, maxillary premolars and molars have the highest incidence of fracture,<sup>10,11</sup> and, due to horizontal masticatory loads, shearing cusps are the most affected, with a ratio of 3:2 for maxillary and 3:1 for mandibular teeth.<sup>1,12</sup>

The prognosis of root canal treated teeth depends on the choice of the 'correct' restorative technique and on masticatory stresses. These considerations underline the fact that root canal treated teeth need complex strategies for their restoration and multidisciplinary treatment. In the past, it was the general opinion of many dental practitioners that root canal treated teeth needed a root canal post and a full coverage crown for their rehabilitation.<sup>2,13</sup> The need for a full-coverage crown to prevent root fracture in endodontically treated posterior teeth has been supported by *in vitro* studies<sup>3,14,15</sup> and by retrospective clinical studies.<sup>4,5,16,17</sup> Sorensen and Martinoff<sup>5,17</sup> reviewed 1273 root canal treated teeth that had been restored from 1 to 25 years previously. Statistical analysis showed that coronal coverage did not significantly improve the rate of clinical success for anterior teeth, whereas it did improve success rates for premolars and molars. However, biomechanical analysis of residual dental tissue, the reliability of adhesive systems, and the availability of aesthetic restorative materials ended with a review of this treatment paradigm.

Today, the choice of the 'best' protocol and material to use in post-endodontic restoration depends on the amount of residual dental tissue, periodontal condition, number of restorations to perform, coronal and root morphology, static and dynamic occlusal contacts, oral hygiene, risk of caries, cost of the restoration, and patient health conditions.<sup>6,11</sup> Furthermore, according to the concepts of minimally invasive dentistry, pursuing the criterion of maximum preservation of remaining sound tooth structure to increase resistance, direct composite restorations are considered a valid option

for treatment. This minimally invasive approach for root-filled teeth has become a valid choice due to the good quality of bonding adhesive systems on enamel and dentine and the high-performance properties of resin composite materials.<sup>5,18</sup> In fact, some recent studies, have reported no difference between full-crown and direct restorations<sup>7,19,20</sup> of endodontically treated posterior teeth.

Fibre post outcome and function remain controversial. Several *in vitro* studies have demonstrated that the insertion of a fibre post within a direct composite restoration increases the fracture resistance of root canal treated teeth.<sup>8,21</sup> Unfortunately, few clinical studies have assessed whether the insertion of fibre posts within direct restorations affects the survival of root canal treated teeth.<sup>9,22</sup> However, several works, both clinical and *in vitro*, have demonstrated that in teeth with cusp coverage, the survival rate was similar in the presence or in the absence of a post in the canal root.<sup>10,11,23,24</sup>

The aim of this retrospective clinical study was to evaluate retrospectively the longevity of endodontically treated teeth restored with direct resin composite without cusp coverage, with or without the insertion of fibre posts. The null hypothesis was that the survival rate of endodontically treated teeth restored with direct composite restorations without cusp coverage perform better with the use of fibre posts than without the use of fibre posts.

## 2. Materials and methods

This study was designed as a retrospective longitudinal evaluation of post-endodontic direct posterior resin composite restorations performed with or without fibre post insertion. The study was carried out in accordance with the ethical principles of the World Medical Association Declaration of Helsinki.

Patients enrolled in the study presented at least one posterior tooth with a restoration following root canal treatment and a follow-up period of at least 12 months. Recruited patients were treated in the Department of Cariology and Operative Dentistry of the Dental School Lingotto, University of Turin, from January 2008 to December 2011 for class II restorations subsequent to endodontic treatment caused by caries or fractures, irreversible pulpitis, or pulpal necrosis. Exclusion criteria were: significant loss of tooth structure which needed indirect restorations, teeth without at least one proximal contact, Full Mouth Plaque Score >20%, the absence of an occlusal load, and patients with a history of bruxism. 298 patients were selected using pre-established inclusion criteria. They were contacted by phone, between January and March 2013, and a follow-up visit was scheduled for each patient who agreed to participate in the study.

### 2.1. Restorative procedures

Undergraduate students in the fifth year of the Dentistry program at the University of Turin performed all post-endodontic restorations considered. In all cases, a standardised clinical procedure was strictly followed. A dental dam (Nic Tone Dental Dam, MDC Dental, Jalisco, Mexico) was used to provide proper field isolation. Accurate caries removal was obtained with tungsten multi-blade burs (Komet, Lemgo,

Download English Version:

<https://daneshyari.com/en/article/3145012>

Download Persian Version:

<https://daneshyari.com/article/3145012>

[Daneshyari.com](https://daneshyari.com)