

Harsukh Educational Charitable Society

International Journal of Community Health and Medical Research

Journal home page: www.ijchmr.com doi: 10.21276/ijchmr

ISSN E: 2457-0117 ISSN P: 2581-5040

Index Copernicus ICV 2018=62.61

Original Research

To assess the effect of crown lengthening on survival of endodontic treated teeth- A clinical study

Shabir Ahmad Bhat¹, Mushtaq Mohammad Bhat², Ab. Wahid Zargar³

¹Dental surgeon at District Hospital Kulgam, Jammu and Kashmir, ^{2,3}Postgraduate Student, Department of Conservative Dentistry & Endodontics, Govt. Dental College and Hospital Shireen Bagh, Srinagar, India

ABSTRACT:

Background: Supragingival placement of margins is generally favored by restorative dentists due to ease in accurate impression. The present study was conducted to assess the effect of crown lengthening on survival of endodontic treated teeth (ETT). **Materials & Methods:** The present study was conducted on 80 patients of both genders. This study was conducted on permanent posterior teeth with opposing dentition that had received adequate nonsurgical root canal treatment (NSRCT) and a full-coverage crown. They were divided into 2 groups of 40 each. Group I were subjected to crown length (CL) and then crown was placed. In group II, teeth underwent ETT and nonsurgical root canal treatment (Control) with no CL. The survival rate of ETT was assessed by recording location, tooth type (molar vs premolar), presence of a preoperative lesion (present: periapical index > 3 vs absent: periapical index < 3), serving as an abutment (yes vs no) and presence of a post (yes vs no). **Results:** In group I, tooth was premolar in 21 and molar in 19 whereas in group II, it was premolar in 24 and molar in 16. Post was present in 26 in group I and 23 in group II and absent in 14 in group I and 17 in group II. Maxillary teeth were in 25 cases and mandible in group I whereas maxillary teeth were in 18 and mandibular in 22 in group II. The difference was non-significant ($P > 0.05$). 5 years survival rate in group I was 82% and in group II was 72%. 10 years rate was 76% in group I and 54% in group II. The difference was significant ($P < 0.05$). **Conclusion:** Authors found that there was less survival rate in teeth in which clinical crown lengthening was performed.

Key words: Endodontic, Post, Premolar

Corresponding author: Dr. Dr. Shabir Ahmad Bhat, Dental surgeon at District Hospital Kulgam, Jammu and Kashmir

This article may be cited as: Bhat SA, Bhat MM, Zargar AW. To assess the effect of crown lengthening on survival of endodontic treated teeth- A clinical study. HECS Int J Comm Health Med Res 2019; 5(2):94-96

INTRODUCTION

Sound periodontal health is a fundamental requirement for long-term success of any restorative procedure. Supragingival placement of margins is generally favored by restorative dentists due to ease in accurate impression, precise detailing of finished restoration, confirmation of marginal integrity, and preservation of periodontal health. However, certain clinical circumstances do not allow the placement of

supragingival margins and necessitate subgingival placement of the restorations.¹

In a recent study, prosthetic reasons such as an inadequate crown-root ratio were among the most predominant causes of tooth extraction after NSRCT. This finding could highlight the importance of the fracture resistance of endodontically treated teeth (ETT) after restorative interventions.² The fracture resistance and prosthetic longevity of ETT have been directly associated

with the presence of a ferrule. A ferrule is defined as a band or ring of restorative material surrounding the crown or root of a tooth to provide strength. It has been reported that teeth without a ferrule show the highest values of variation of success/survival compared with ETT with an adequate ferrule.³

There are significant voids in the knowledge of several procedural aspects and clinical outcomes such as crown length (CL) increase, position of gingival margin (PGM), biological width (BW), bone level changes, probing depth (PD), and clinical attachment level (CAL) regarding esthetic surgical crown lengthening (SCL). A comprehensive review reported that at least 6 months are necessary for stable restorative outcomes.⁴ The present study was conducted to assess the effect of crown lengthening on survival of ETT.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. It comprised of 80 patients of both genders. The study protocol was approved from institutional ethical committee and all were informed regarding the study and written consent was obtained

Patients information such as name, age, gender etc. was recorded. This study was conducted on permanent posterior teeth with opposing dentition that had received adequate nonsurgical root canal treatment (NSRCT) and a full-coverage crown. They were divided into 2 groups of 40 each. Group I were subjected to crown length (CL) and then crown was placed. In group II, teeth underwent ETT and nonsurgical root canal treatment (Control) with no CL.

The survival rate of ETT was assessed by recording location, tooth type (molar vs premolar), presence of a preoperative lesion (present: periapical index > 3 vs absent: periapical index < 3), serving as an abutment (yes vs no) and presence of a post (yes vs no). Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 80		
Groups	Group I (crown lengthening)	Group II (Control)
Number	40	40

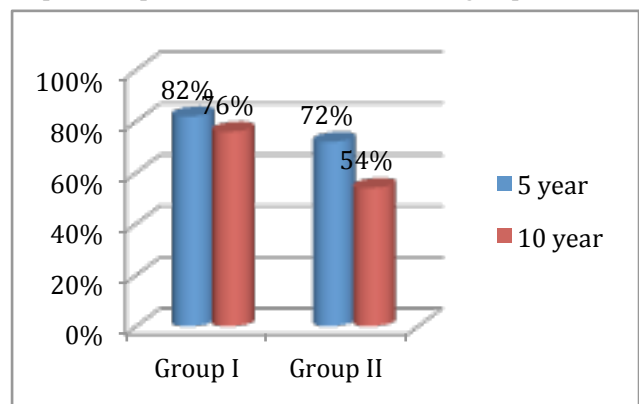
Table I shows that group I were subjected to crown length (CL) and then crown was placed. In group II, teeth underwent ETT and nonsurgical root canal treatment (Control) with no CL.

Table II Comparison of parameters

Parameters	Group I	Group II	P value
Tooth type			
Premolar	21	24	0.5
Molar	19	16	
Post			
Present	26	23	0.31
Absent	14	17	
Location			
Maxilla	25	18	0.23
Mandible	15	22	

Table II shows that in group I, tooth was premolar in 21 and molar in 19 whereas in group II, it was premolar in 24 and molar in 16. Post was present in 26 in group I and 23 in group II and absent in 14 in group I and 17 in group II. Maxillary teeth were in 25 cases and mandible in group I whereas maxillary teeth were in 18 and mandibular in 22 in group II. The difference was non- significant (P> 0.05).

Graph I Comparison of survival rate in both groups



Graph I shows that 5 years survival rate in group I was 82% and in group II was 72%. 10 years rate was 76% in group I and 54% in group II. The difference was significant (P< 005).

DISCUSSION

Nonsurgical root canal treatment (NSRCT) is a successful treatment with a predictable long term survival rate. It is well-documented that besides endodontic factors, other variables such as prosthetic restorability and periodontal status can affect the survival of endodontically treated teeth (ETT).⁵ Various studies have concluded that non restorable crown fractures and periodontal diseases are the leading causes of

tooth loss after endodontic interventions. Furthermore, another systematic review concluded outcomes of SCL depend primarily on technical aspects such as flap margin position relative to alveolar bone crest, amount of osseous resection, and tooth root preparation.⁶ The present study was conducted to assess the effect of crown lengthening on survival of ETT.

In this study, group I were subjected to crown length (CL) and then crown was placed. In group II, teeth underwent ETT and nonsurgical root canal treatment (Control) with no CL. In group I, tooth was premolar in 21 and molar in 19 whereas in group II, it was premolar in 24 and molar in 16. Post was present in 26 in group I and 23 in group II and absent in 14 in group I and 17 in group II. Maxillary teeth were in 25 cases and mandible in group I whereas maxillary teeth were in 18 and mandibular in 22 in group II. Friedman et al⁷ conducted a study on permanent posterior teeth with opposing dentition that had received adequate nonsurgical root canal treatment (NSRCT) and a full-coverage crown. All included ETT were divided into 2 groups: the CL group, CL was indicated and performed after NSRCT before crown placement and the control group: ETT with adequate ferrule after NSRCT. 5-year survival rates of ETT in the control and CL groups were 88.6% and 82.2%, respectively ($P > .05$). The 10-year survival rates of ETT in the control and CL groups were 74.5% and 51%, respectively ($P < .05$). ETT that received the CL procedure after NSRCT were almost 2.3 times more likely to get extracted compared with ETT that did not need the CL procedure at the 10-year follow-up (hazard ratio = 2.29, $P < .05$). Also, ETT with an inadequate crown-root ratio (1:1) after CL showed the lowest survival rate (40%) compared with ETT with an adequate crown-root ratio (<1:1). Pereira et al⁸ based on the preferred reporting items for systematic review and meta-analysis (PRISMA) guidelines, forest plots were computed reporting weighted mean difference (WMD) of outcomes and 95% confidence intervals (CI) for crown length (CL), position of gingival margin (PGM), biological width (BW), and bone level changes. The risk of bias was considered high in all studies. A high degree of heterogeneity was noticed for CL, PGM, and BW. The overall mean difference for CL (WMD = -1.84, 95% CI = -0.103 to 2.05, $p = 0.076$), PGM (WMD = 0.87, 95% CI = 0.12 to 1.62, $p = 0.02$), and BW (WMD = -0.11, 95% CI = -2.21 to 1.99, $p = 0.91$) were not significant at follow-up. The overall mean difference for bone level changes was significant (WMD = 1.64, 95% CI = 1.26 to 2.03, $p < 0.001$) at follow-up.

CONCLUSION

Authors found that there was less survival rate in teeth in which clinical crown lengthening was performed.

REFERENCES

1. Lazarski MP, Walker WA, Flores CM, et al. Epidemiological evaluation of the outcomes of nonsurgical root canal treatment in a large cohort of insured dental patients. *J Endod* 2001;27:791-6.

2. Salehrabi R, Rotstein I. Endodontic treatment outcomes in a large patient population in the USA: an epidemiological study. *J Endod* 2004;30:846-50.
3. Pratt I, Aminoshariae A, Montagnese TA, et al. Eight-year retrospective study of the critical time lapse between root canal completion and crown placement: its Influence on the survival of endodontically treated teeth. *J Endod* 2016;42:1598-603.
4. Setzer FC, Boyer KR, Jeppson JR, et al. Long-term prognosis of endodontically treated teeth: a retrospective analysis of preoperative factors in molars. *J Endod* 2011;37:21-5.
5. Khalighinejad N, Aminoshariae A, Kulild JC, et al. The influence of periodontal status on endodontically treated teeth: 9-year survival analysis. *J Endod* 2017; 43:1781-5.
6. Olcay K, Ataoglu H, Belli S. Evaluation of related factors in the failure of endodontically treated teeth: a cross-sectional study. *J Endod* 2018;44:38-45.
7. Friedman S, Mor C. The success of endodontic therapy: healing and functionality. *Calif Dent Assoc* 2004;32:493-503.
8. Pereira JR, de Ornelas F, Conti PC, do Valle AL. Effect of a crown ferrule on the fracture resistance of endodontically treated teeth restored with prefabricated posts. *J Prosthet Dent* 2006;95:50-4.