

## Harsukh Educational Charitable Society

### International Journal of Community Health and Medical Research

Journal home page: [www.ijchmr.com](http://www.ijchmr.com)

doi: 10.21276/ijchmr

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

Index Copernicus ICV 2018=62.61

## ORIGINAL ARTICLE

### Comparison of periodontal splinting by wiring and capping

Rani Kumari Gupta<sup>1</sup>, Purushottam Singh<sup>2</sup>

<sup>1</sup>Tutor, Department of Prosthodontics, <sup>2</sup>Reader, Department of Periodontics, Patna Dental college and Hospital, Bankipur, Patna.

#### ABSTRACT:

**Background:** The loss of a single anterior tooth may be a catastrophic event for a patient. In advanced periodontal disease such a loss is unfortunately often accompanied by adjacent tooth mobility due to severe bone loss. Hence, the present study was conducted with the aim of comparing periodontal splinting by wiring and capping. **Materials & methods:** A total of 30 patients were enrolled in the present study. Only those patients were included in which tooth mobility was present. Miller's mobility index (MMI) was used for grading the pre-splinting tooth mobility. Mobility was graded from grade 0 to grade 3. All the patients had grade 3 mobility at pre-treatment time. Out of 30 patients, in 15 patients, splinting was done by wiring while in the remaining 15 patients, periodontal splinting was done with capping. Assessment of mobility was done after 8 months of splinting treatment. **Results:** Among the patients of the wiring group post-treatment, 8 patients and 5 patients were of grade 2 and grade 1 of Miller's mobility index while the remaining 2 patients were of grade 3. Among the patients of the capping group post-treatment, 11 patients and 3 patients were of grade 2 and grade 1 of Miller's mobility index while the remaining 1 patient was of grade 3. Non-significant results were obtained while comparing the mobility post-treatment among the patients of the two study groups. **Conclusion:** Both wiring and capping can be used for treating patients with higher degree of tooth mobility.

**Key words:** Capping Splinting, Wiring

**Corresponding author:** Dr. Purushottam Singh, Reader, Department of Periodontics, Patna Dental college and Hospital, Bankipur, Patna.

**This article may be cited as:** Gupta RK, Singh P, Comparison of periodontal splinting by wiring and capping. HECS Int J Comm Health Med Res 2019; 5(4)80-83.

#### INTRODUCTION

The loss of a single anterior tooth may be a catastrophic event for a patient. In advanced periodontal disease such a loss is unfortunately often accompanied by adjacent tooth mobility due to severe bone loss. Furthermore, periodontal disease also chronically dislodges teeth due to the masticatory movement of the mobile teeth, which seriously affects anterior aesthetics, especially for the upper anterior teeth. Therefore, prosthodontic rehabilitation is often necessary to restore aesthetics and function in periodontally compromised dentition.<sup>1-3</sup> Fixed retainers are indicated for long-term retention of the labial segments, particularly when there is reduced periodontal support, and for retention of a midline diastema. Vasconcelos et al. also recommended this type of splint, in addition, they said that when a rigid fixation is placed, there is a higher degree of bone growth over the periodontal space with consequent ankylosis and replacement resorption. Also in 2001, a literature review made by Pereira et al. reported a case that the avulsed teeth were replanted and fixed with a rigid wire (0.9) and composite resin for 2 weeks, and then the endodontic treatment was performed.<sup>4-6</sup>

Hence; the present study was conducted with the aim of comparing periodontal splinting by wiring and capping.

#### MATERIALS & METHODS

The present study was conducted in the department of periodontology of the medical institute and it included comparison of periodontal splinting by wiring and capping. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 30 patients were enrolled in the present study. Only those patients were included in which tooth mobility was present. Miller's mobility index (MMI)<sup>3</sup> was used for grading the pre-splinting tooth mobility. Mobility was graded from grade 0 to grade 3. All the patients had grade 3 mobility at pre-treatment time. Out of 30 patients, in 15 patients, splinting was done by wiring while in the remaining 15 patients, periodontal splinting was done with capping. Complete demographic and clinical details of all the patients were obtained. Complete oral examination was done at the baseline using a mouth mirror and probe. Assessment of mobility was done after 8

months of splinting treatment. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi-square test was used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

**RESULTS**

In the present study, a total of 30 patients were analysed. Among the patients of the wiring group, 6 patients belonged to the age group of 41 to 50 years. 4 and 3 patients belonged to the age group of 31 to 40 years and less than 30 years respectively. 2 patients were of more than 50 years of age. Among the patients of the capping group, 5 patients belonged to the age group of 41 to 50 years. 4 patients each belonged to the age group of 31 to 40 years and less than 30 years respectively. 2 patients were of more than 50 years of age. Among the patients of the wiring group, there were 8 males and 7 females while among the patients of the capping group, there were 9 males and 6 females. Among the patients of the wiring group, 11 patients were of rural residence while the remaining 4 patients of urban residence. 10 patients were of rural residence while the remaining 5 patients of urban residence. In the present study, among the patients of the wiring group post-treatment, 8 patient and 5 patients were of grade 2 and grade 1 of Miller’s mobility index while the remaining 2 patients were of grade 3. Among the patients of the capping group post-treatment, 11 patient and 3 patients were of grade 2 and grade 1 of Miller’s mobility index while the remaining 1 patient was of grade 3. Non-significant results were obtained while comparing the mobility post-treatment among the patients of the two study groups.

Table 1: Comparison of demographic data between the wiring group and capping group

Parameter		Wiring group	Capping group
Age group (years)	Less than 30	3	4
	31 to 40	4	4
	41 to 50	6	5
	More than 50	2	2
Gender	Males	8	9
	Females	7	6
Residence	Rural	11	10
	Urban	4	5

Graph 1: Comparison of demographic data between the wiring group and capping group

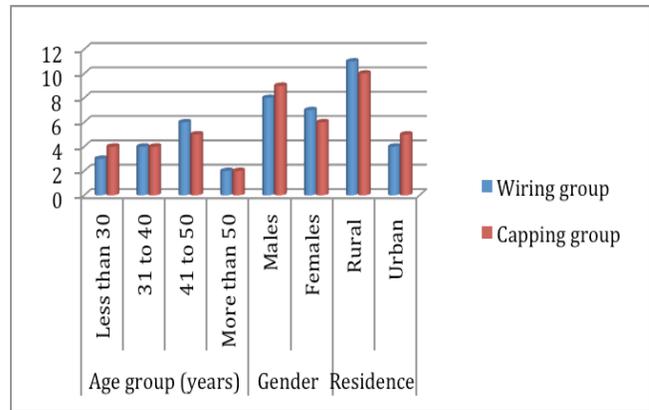


Table 2: Comparison of Miller's mobility index post treatment

Miller's mobility index	Wiring group	Capping group
Grade 0	0	0
Grade 1	5	3
Grade 2	8	11
Grade 3	2	1
Chi-square	1.59	
p-value	0.082 (Non-Significant)	

**DISCUSSION**

Splints may be constructed of many materials. They may be as simple as a bonded composite resin button from one tooth to another. This stabilization is transient in nature, due to the inability of composite resin to accommodate shear forces. Development of resin-impregnated, fiber-reinforced composite (FRC) materials has provided the potential to develop new approaches for stabilizing teeth and replacing teeth conservatively.<sup>6-8</sup>Hence; the present study was conducted with the aim of comparing periodontal splinting by wiring and capping. In the present study, a total of 30 patients were analysed. Among the patients of the wiring group, 6 patients belonged to the age group of 41 to 50 years. 4 and 3 patients belonged to the age group of 31 to 40 years and less than 30 years respectively. 2 patients were of more than 50 years of age. Among the patients of the capping group, 5 patients belonged to the age group of 41 to 50 years. 4 patients each belonged to the age group of 31 to 40 years and less than 30 years respectively. 2 patients were of more than 50 years of age. Among the patients of the wiring group, there were 8 males and 7 females while among the patients of the capping group, there were 9 males and 6 females. Among the patients of the wiring group, 11 patients were of rural residence while the remaining 4 patients of urban residence. 10 patients were of rural residence while the remaining 5 patients of urban residence. Čelebić A et al conducted a study to assess self-perceived chewing function (CF) and oral health-related quality of life (OHRQoL) in geriatric patients after receiving three different treatment modalities in the mandible: removable partial denture (CD-RPD), complete denture (CDs), or complete overdenture supported by mini dental implants (CD-MDI). At baseline, all patients had mobile anterior teeth (1 mm or >) and missing posterior teeth in the mandible. Patients were completely edentulous in the maxilla. After treatment, patients were recalled

at the 3-month and the 2-year post-treatment period. A total of 176 patients participated (CD group, n=68; CD-RPD group, n=58; CD-MDI group, n=50). Self-reported CF was assessed using the Chewing Function questionnaire (CFQ), The OHRQoL was evaluated using the OHIP14 questionnaire, which the patients completed 1. before treatment, 2. three months after treatment, and 3. at the 2-year post-treatment stage. The OHRQoL and the self-perceived CF significantly improved in all groups after treatment ( $p < 0.01$ ). The highest improvement of a CF was recorded in the CD-MDI group. The OHRQoL was significantly higher in the CD-MDI group in comparison to the CDs group after treatment ( $p < 0.01$ ). At the 2-year post-treatment stage, self-perceived CF significantly further improved in the CD-MDI group, while it worsened in the CD and the CD-RPD groups ( $p < 0.01$ ). The same pattern was recorded for the OHIP14 summary scores. The highest amount of denture repairs and adjustments was recorded in the CD-RPD group, although maintenance was also demanding in the CD-MDI group. Rehabilitation with mandibular MDI retained overdenture can be considered as preferred treatment with the constant improvement of OHRQoL and a chewing function in comparison to mandibular CD or mandibular RPD option in patients with mobile anterior mandibular teeth.<sup>9</sup>

In the present study, among the patients of the wiring group post-treatment, 8 patient and 5 patients were of grade 2 and grade 1 of Miller's mobility index while the remaining 2 patients were of grade 3. Among the patients of the capping group post-treatment, 11 patient and 3 patients were of grade 2 and grade 1 of Miller's mobility index while the remaining 1 patient was of grade 3. Non-significant results were obtained while comparing the mobility post-treatment among the patients of the two study groups. Mazzoleni S et al evaluated the flexibility of five different splint systems [polyethylene fibre-reinforced splint (Ribbond THM, Ribbond Inc., Seattle, WA, USA), resin splint (RS), wire-composite splint (WCS), button-bracket splint (BS) and titanium trauma splint (TTS)] commonly used in clinical practice for the treatment of dental traumatic injuries involving the periodontal supporting tissues. For the experimental study, a resin cast of the upper arch was manufactured, where teeth 11, 12 and 21 (used for the stress analysis) were inserted in a non-rigid fashion so as to allow for replacement, whereas the other teeth were permanently fixed to the corresponding sockets. Two different test sessions were performed for each splint: (i) stress analysis with increasing intensity ranging between 0 and 50 N directed along the tooth's longitudinal axis; (ii) stress analysis with 45 degrees of oblique force of increasing intensity ranging between 0 and 30 N. For each loading direction, five recordings were conducted without a splint, followed by five with the splint applied. The energy required to modify the position of the teeth was calculated for both the splinted and un-splinted teeth and the difference between the two values was determined. Energy variation was assessed for the testing of both axial ( $\Delta E(a)$ ) and oblique force ( $\Delta E(o)$ ).  $\Delta E$  represents the rigidity index of the analysed contention devices: high  $\Delta E$  values correspond to high rigidity materials. The RS showed the highest  $\Delta E$  value for the axial stress analysis, whereas the highest  $\Delta E$  value at a 45 degrees was recorded for the WCS and RS. For both tests, the lowest  $\Delta E$  values were recorded for the TTS and Ribbond THM splints. The data showed that the contention devices with the highest flexibility are the TTS and the Ribbond THM as they exhibit a lower energy variation needed for splint deformation compared with the other materials that were examined.<sup>10</sup>

## CONCLUSION

From the above results, the authors conclude that both wiring and capping can be used for treating patients with higher degree of tooth mobility. However, further studies are recommended.

## REFERENCES

1. Viegas CM, Scarpelli AC, Carvalho AC, Ferreira FM, Pordeus IA, Paiva SM. Predisposing factors for traumatic dental injuries in Brazilian preschool children. *Eur J Paediatr Dent.* 2010. June;11(2):59–65.
2. Wendt FP, Torriani DD, Assunção MC, Romano AR, Bonow ML, da Costa CT et al. Traumatic dental injuries in primary dentition: epidemiological study among preschool children in South Brazil. *Dent Traumatol.* 2010. April;26(2):168–73.
3. Miller S.C. Blakiston Co; Philadelphia: 1950. *Textbook of Periodontia*; p. 91
4. Vasconcelos BC, Fernandes BC, Aguiar ER. Reimplante dental. *Rev. Cir. Traumat. Buco-Maxilo-Facial.* 2001;1(2):45–51.
5. Trope M, Chivian N, Sigurdsson A. *Traumatismo dentário.* Rio de Janeiro; 2000. pp. 520–64.
6. Pereira NR, Júnior JP, Ribeiro BL, Silva PG, Fukada MY. Replantation of avulsed permanent tooth. *RGO.* 2001;49(4):230–4.
7. Leung DY, Leung AY, Chi I. Factors associated with chewing problems and oral dryness among older Chinese people in Hong Kong. *Gerodontology.* 2016;33:106–15.
8. Kossioni AE, Kossionis GE, Polychronopoulou A. Oral health status of elderly hospitalised psychiatric patients. *Gerodontology.* 2012;29:272–83.
9. Čelebić A, Peršić S, Kovačić I, Buković D, Lešić N, Rener-Sitar K. Comparison of Three Prosthodontic Treatment Modalities for Patients with Periodontally Compromised Anterior Mandibular Teeth: A 2-year follow-up study. *Acta Stomatol Croat.* 2019;53(1):4–16.
10. Mazzoleni S1, Meschia G, Cortesi R, Bressan E, Tomasi C, Ferro R, Stellini E. In vitro comparison of the flexibility of different splint systems used in dental traumatology. *Dent Traumatol.* 2010 Feb;26(1):30-6.

