

Assessment of the Treatment Response of TMJ to Occlusal Splint Therapy

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ABSTRACT

Background: The recording of sounds of temporomandibular joint is a vital tool for the evaluation and clinical examination of joint disorders. Since a long, there were only palpation or auscultation techniques used, and clicking could be classified on the basis of the frequency of the click, but its the degree that could not be quantitatively measured. The present study was conducted with the aim to assess the treatment response of TMJ to occlusal splint therapy.

Materials and Methods: The present prospective randomized study was carried out in the Department of prosthodontics for a period of 2 years. Patients with ankylosis, spondylitis referring to TMJ, rheumatoid arthritis were excluded from the study. Maximum mouth opening, presence of clicking/noise were noted. Tenderness over TMJ and Pain score was measured using VAS amongst all the patients preoperatively and postoperatively. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

Results: The present study enrolled 30 subjects with the mean age of 31.67 $\pm$ 1.26 years. In Group I it was 46.32 $\pm$ 4.55 mm at first week, 50.76 $\pm$ 5.67 mm at 5 weeks and 51.38 $\pm$ 3.76 mm at 10 weeks. In Group II it was 43.43 $\pm$ 2.56 mm at first week, 46.85 $\pm$ 4.85 mm at 5 weeks and 48.43 $\pm$ 3.54 mm at 10 weeks.

Conclusion: There was no significant difference observed amongst the different types of splints used in our study.

Keywords: Splint, temporomandibular, pain.

INTRODUCTION

Disorders of temporomandibular joint are a combination of coexisting circumstances and clinical situations, where the occurrence of muscle-associated disorders is more than just intracapsular joint related.^[1] Due to varied clinical presentations, a variety of modifications were performed in Research and Diagnostic Criteria's for the disorders of temporomandibular^[2] and multiple management options are being provided. Apart from complete

history, clinical evaluation, and instrumental and diagnostic analysis, the progressive electronic recording methods like electromyography, thermography, electrosonography, electrovibratography and axiographic measurements were documented since the year 1980 for improved diagnosis and more effective management of displacement of disc with reduction.^{[3],[4]} The recording of sounds of temporomandibular joint is a vital tool for the

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evaluation and clinical examination of joint disorders. Since a long, there were only palpation or auscultation techniques used, and clicking could be classified on the basis of the frequency of the click, but its the degree that could not be quantitatively measured.^[5] The joint vibration analysis on the basis of vibratory methods with 70%–85% sensitivity and specificity in diagnosing joint disorders which measured the small vibrations that condyle produces during translation.^{[6],[7]} The various recording system gives accurate readings of intensity, duration, frequency and accurate closing or opening point of the joint noises in case of bilateral of reduced displaced discs by producing vibrations that are different from vibrations of the normal joints over visual examination of the wave transformations.^[8] Reliability of these vibration were evaluated using two different studies, that found a hefty range of reliability values of the sounds produced by joint.^{[9],[10]} The present study was conducted with the aim to assess the treatment response of TMJ to occlusal splint therapy.

MATERIALS AND METHODS

The present prospective randomized study was carried out in the Department of prosthodontics for a period of 2 years. The study was approved by the institutional ethical committee and all the subjects were informed about the study and a written consent was obtained from them in their vernacular language. Subjects between 20-50 years of age with temporomandibular joint disorders, clicking or popping sound, reduced or deviated mouth opening or any other symptoms were divided into three groups. Group I patient received conventional splints (Ant repositioning splint), Group II patients received Central stabilization splint and Group III subjects received soft splint. Patients with ankylosis, spondylitis referring to TMJ, rheumatoid arthritis were excluded from the study. Maximum

mouth opening, presence of clicking/noise were noted. Tenderness over TMJ and Pain score was measured using VAS amongst all the patients preoperatively and postoperatively. Casts were prepared from the maxillary and mandibular impressions for all the patients. 3D Jaw Tracker equipment was used for recording the movements in lateral, vertical, antero/posterior direction. Casts were mounted on HANAU articulator followed by wax up of the splint. Processing was done with transparent dental resin and splint was retrieved and polished. Retention of the splints was checked and any interfaces present on the occlusal surface was adjusted on the day of appointment and on subsequent appointments. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

RESULTS

The present study enrolled 30 subjects with the mean age of 31.67+/-1.26 years. There were 10 subjects in each group. There were 20 females and 10 males in the study. Table 1 illustrates the maximum mouth opening amongst the subjects. In Group I it was 46.32+/-4.55 mm at first week, 50.76+/-5.67 mm at 5 weeks and 51.38+/-3.76 mm at 10 weeks. In Group II it was 43.43+/-2.56 mm at first week, 46.85+/-4.85 mm at 5 weeks and 48.43+/-3.54 mm at 10 weeks. In Group III it was 43.38+/-6.74 mm at first week, 45.48+/-3.22 mm at 5 weeks and 47.43+/-2.34 mm at 10 weeks. There was no significant difference between the groups.

Table 2 illustrates the pain scores amongst the subjects. In Group I it was 2.14+/-1.89 at first week, 0.9+/-1.23 at 5 weeks and 0.5+/-0.95 at 10 weeks. In Group II it was 3.80+/-1.98 at first week, 1.76+/-1.83 at 5 weeks and 1.27+/-0.76 at 10 weeks. In Group III it was 3.76+/-1.32 at first week, 2.45+/-1.54 at 5 weeks and 2.13+/-1.22 at 10 weeks. There was no significant difference between the groups.

Table 1: Mean maximum mouth opening

	Ant repositioning app	Central stabilization splint	Soft splint	P value
1 week	46.32+/-4.55	43.43+/-2.56	43.38+/-6.74	>0.05
5 weeks	50.76+/-5.67	46.85+/-4.85	45.48+/-3.22	>0.05
10 weeks	51.38+/-3.76	48.43+/-3.54	47.43+/-2.34	>0.05

Table 2: Mean maximum pain score

	Ant repositioning app	Central stabilization splint	Soft splint	P value
1 week	2.14+/-1.89	3.80+/-1.98	3.76+/-1.32	>0.05
5 weeks	0.9+/-1.23	1.76+/-1.83	2.45+/-1.54	>0.05
10 weeks	0.5+/-0.95	1.27+/-0.76	2.13+/-1.22	>0.05

DISCUSSION

All the temporomandibular joint disorders have a multifactorial etiology and different factors contribute in the causation and management of the disorder that it become disorienting to manage a joint disorder in the correct manner. Therefore, the management of all joint disorders cannot never be the same, and management plan for each sub type of joint disorder should have a specific guideline by initiating with conservative therapies like physical therapy, drug therapy, splint therapy, and more rigoroussurgical therapies like occlusal rehabilitation and joint surgeries should be taken into consideration when former fails. As the surgical therapies are not reversible, they should be considered only as the last resort; with reevaluation and longfollow-ups are necessary for such therapies to enable complete management of the disorder.^[11] While managing joint disorders, it is a challenge for clinician to choose the appropriate type of splint even though few studies showed that the success of splint therapy has fewer to do with the making or the type of the splint but with the disjunction of derranged neuromuscular reflexes because of partial malocclusion of maxillary and mandibular teeth.^{[10],[11]} The conventional anterior repositioning appliance needs regular and frequent follow ups as it carries a risk of posterior open bite. Some of the studies suggested that centric stabilization splints shows fewer issueswhen compared to ARA after treatment ^{[5],[12]} and that soft splints should be used in subjects of myofascial pain dysfunction syndrome rather than intracapsular joint disorders.^[1]In our study, The maximum mouth opening in Group I it was 46.32+/-4.55 mm at first week, 50.76+/-5.67 mm at 5 weeks and 51.38+/-3.76 mm at 10 weeks. In Group II it was 43.43+/-2.56 mm at first week, 46.85+/-4.85 mm at 5 weeks and 48.43+/-3.54 mm at 10 weeks. In Group III it was 43.38+/-6.74 mm at first week, 45.48+/-3.22 mm at 5 weeks and 47.43+/-2.34 mm at 10 weeks.

There was no significant difference between the groups. The mean pain scores in Group I it was 2.14+/-1.89 at first week, 0.9+/-1.23 at 5 weeks and 0.5+/-0.95 at 10 weeks. In Group II it was 3.80+/-1.98 at first week, 1.76+/-1.83 at 5 weeks and 1.27+/-0.76 at 10 weeks. In Group III it was 3.76+/-1.32 at first week, 2.45+/-1.54 at 5 weeks and 2.13+/-1.22 at 10 weeks. There was no significant difference between the groups.As per the study by Stiesch-Scholz *et al.* there was a 8.05mm rise in active jaw opening in patients with stabilization splint therapy compared to 8.26 mm in pivot splint therapy subjects, the success of therapy was found to be independent of the type of splint design and no significant difference was observed amongst two splint groups they amongst subjects with disc displacement without reduction patients.^[13] Other reason for no significant difference amongst the groups can be smaller sample size in the present study. The effectiveness of the splint may also be altered by psychological actionslike an increased cognitive awareness for the oral habits amongst the subjects, and placebo effect along with remission of symptoms.^[5]

CONCLUSION

Temporomandibular joint disorders are a commonly encountered problem with a high global incidence. There are a vast majority of adults suffering from this issue. Anterior repositioning device is the commonly used splint type. There was no significant difference observed amongst the different types of splints used in our study.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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