



Stabilization Splint (Night Guard, Mouth Guard) Comparative Research

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Abstract

This research compares between the effect of flexible and hard stabilization splint (night guard, mouth guard) in the treatment of patients with tempo-mandibular joint problems.

Four different categories of patients are used for comparison, each composed of ten patients. Category number one and two are treated with flexible mouth guard, while category three and four are treated with hard type of mouth guard for the same periods of time, one month and three months respectively. Analysis of the results indicate that patient category treated with soft stabilization splints for longer period of time show improved treatment and the patients are more relived and willing to continue the treatment than those treated with hard splints.

Keywords: Stabilization Splint, acrylic resin (hot cure type).

Introduction

Tempromandibular disorder (TMD) is a common; patients experience either pain or complain from propping, clicking, and other noises that emanate while the tempromandibular joint (TMJ) is in motion¹.

Numerous factors may cause pain associated with TMD. A history of bruxism, (involuntary clenching and grinding of teeth usually occurring at night), poorly aligned teeth, ill fitting dentures, trauma and physical and emotional stresses. It is characterized by a dull, aching, radiating pain that becomes aggravated with jaw movement and function, and may involve limited mouth opening^{1, 2, 3, 4, 5}.

The most widely and common treatment employed for TMD is the stabilization splint, which protects the teeth in patients with bruxism and improve jaw muscle and TMJ function and relive related pain. It acts as

etiologic treatment by avoiding undesirable occlusal contacts and interferences⁶.

The aim of this study is to compare between the stabilization splints that are made from hard acrylic with those made from flexible one (custom made), for the treatment of TMD.

Materials and Methods

Forty patients (30 female, 10 male), with age group (20-60 years old) were randomly selected and taken in this research. They were suffering from symptoms in the TMJ and who had visited private clinic in Al Solaimanya for this reason.

All patients suffer from clicking and limited mouth opening and pain, the clinical examination was dependent on case history and palpitation of TMJ done by one operator to decrease

variables. Two types of mouth (night) guard were made for 40 patients divided into four categories, ten patients each, category numbers one and two were made from flexible materials by the use of Biostar device as shown in Figure (1).

And category numbers three and four were made from hard acrylic, for the same periods of time, one month and three months respectively. Both types were custom made, in four stages as shown in Figure (2).

1. Impression and model.
2. Fabrication.
3. Trimming.
4. Delivery.

The categories were divided as follows:

1. Category No.1 consisted from 8 female and 2 male age range (25-55).
2. Category No.2 consisted from 6 female and 4 male age range (30-60).
3. Category No.3 consisted from 6 female and 4 male age range (20-50).
4. Category No.3 consisted from 8 female and 2 male age range (20-60).

All patients showed history of psychological diagnosis like low perceived life control. The night guards that all patients received cover the whole upper dental arch to the level of the cervical gingiva as shown in Figure (3), care was taken that all mouth guards were properly fitted and the occlusal contact during static occlusion was checked intraorally for balance.

For the flexible mouth guard two thickness cakes were used 2mm, for one month and 4mm for three month period time, while for the hard acrylic the occluding thickness was determined during packing and

flasking in a manner that simulate the thicknesses of prefabricated cakes of the flexible mouth guard.

All patients were advised to apply the splint during night, in each follow up the occlusal contacts were checked and adjusted. In all follow up visits clinical examination was performed in order to evaluate effect of guard therapy as tooth loosening, tooth intrusion and sensitivity on biting all were checked as if present they were considered as side effect. All examinations were done by one investigator.

Results

All the selected groups were suffering from limited mouth opening at the first clinical examination and were randomly selected.

Measurements were taken by the use of digital vernier as shown in Figure (4), for all categories with and without stabilization splint. For categories one and three measurements were taken for every week until the end of month, while for categories two and four measurements were taken after first week and then every month until the end of the forth visit. The mean difference and standard deviation of all categories are shown in Table (1).

After application of t-test, significant differences appeared between all categories especially between category one and three and between two and four as shown in Table (2). All categories did not show teeth mobility after the end of study.

For Analysis of Variance (ANOVA) Table (3), the results show significant difference for categories (1,3), (3,4), and (2,4) except for categories (1,2) which shows non significant difference.

Discussion

The present study compares two types of stabilization splints, one made from hard acrylic and one made from soft material in treatment of patients with TMD. This study came in agreement with nearly all previous ones, as the application of stabilization splint will reduce the symptoms of TMD and helps in improving the opening and closing of the oral cavity, because of its tried protective properties⁵. Stabilization splints are employed to provide a balanced function of the joint, protect teeth, redistribute the forces applied to the jaws, relax the masticatory muscles and decrease the bruxism⁶.

Considering the results in Table (2) and Table (3), it can be stated that there was significant difference between the categories (1,3) and (2,4) as the prolonged treatment gives better outcomes than short ones and also the soft splints were tolerated far better than the hard acrylic. This study agreed with⁷, in that a hard acrylic stabilization splint does not yield better clinical results than soft splints.

Treatment with stabilization splints showed a positive outcome in TMD treatment need which agrees with this study and also showed disagreement with Ekberg et al as revealed in⁸.

It was suggested from these facts that the use of stabilization splint has the effect of reducing the hyperactivity and the asymmetry in the activity of the jaw elevator muscles, and produce neuromuscular balance^{9,10}. Solberg et al, Lobbezoo et al, and Visser et al, all showed a decrease in nocturnal muscle activity after insertion of stabilization splint, which came in line with this study as revealed in¹¹.

This study also came in agreement with¹², and¹³, as the stabilization splint are considered conservative and

reversible therapy for TMD patients and can reduce pain in most cases.

Conclusion

The present study allowed the conclusion that soft stabilization splints are better than hard acrylic splints in reducing signs and symptoms of etiologic factors of the TMD, especially in prolonged treatment time than short treatment time.

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Table (1): shows the mean and standard deviation of all categories.

Categories	Mean	Standard deviation
Category 1	33.0525	1.6954
Category 3	30.6075	0.9846
Category 2	33.375	1.5017
Category 4	31.1825	1.4073

Table (2): shows the significance of differences between all categories.

Categories	*P-value	Confidence Interval	Significance level
1,3	0.0112	1.0586 3.8314	S
1,2	0.0298	-1.4302 -0.1398	S
3,4	0.1011	-0.2065 -1.3565	NS
2,4	0.0194	0.8136 4.4964	S

*P-value according to Student's t-test.

($P > 0.05$) significant difference (S).

($P < 0.05$) not significant differences (NS).

Table (3): shows the significance of differences between all categories.

Categories	ss	Df	Ms	F	P
1,3	11.9561	1	11.9561	6.22	0.0469 S
	11.5314	6	1.9219		
	23.4874	7			
1,2	1.2325	1	1.23245	0.48	0.5141 NS
	15.3882	6	2.56469		
	16.6206	7			
2,4	14.0891	1	14.0891	6.66	0.0114 S
	12.707	6	2.1178		
	26.805	7			
3,4	0.66125	1	0.66125	0.45	0.5281 S
	8.85015	6	1.47502		
	9.5114	7			

ss= sum of squares.

df= degree of freedom.

Ms= mean square.

F= ratio.

P= probability.



Figure (1): Biostar device used for fabrication of flexible mouth guard.

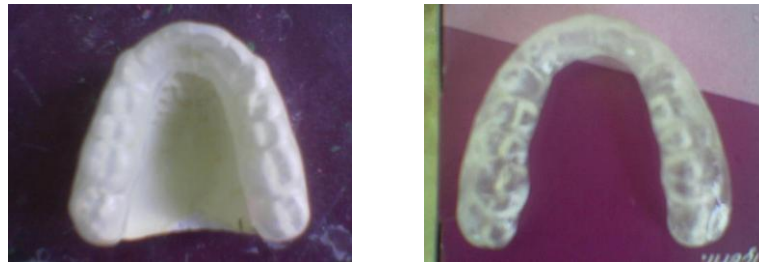


Figure (2): Flexible and hard mouth guards respectively.

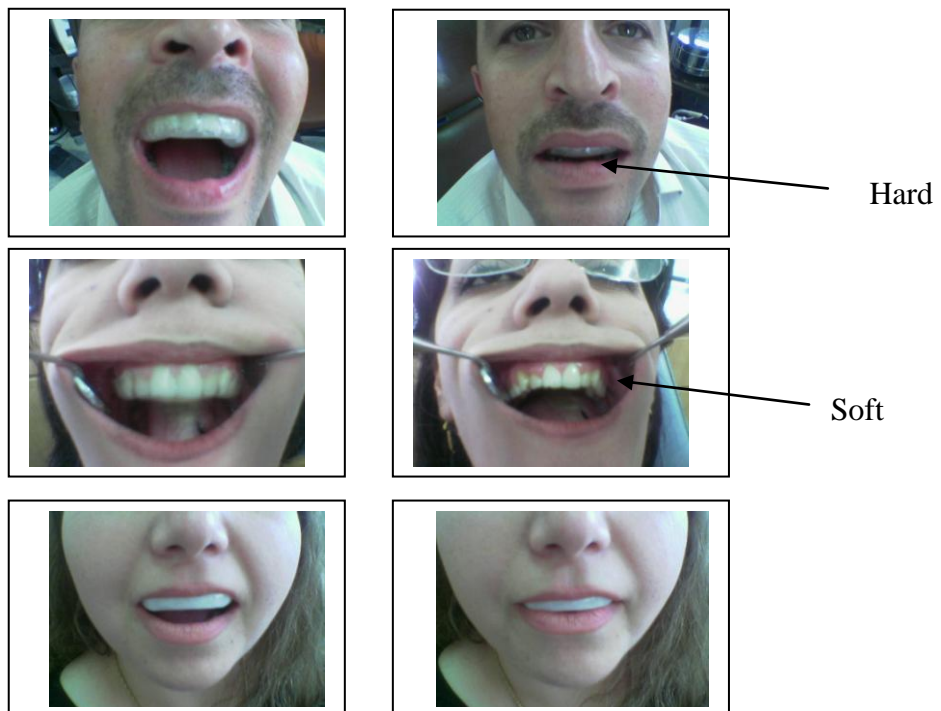


Figure (3): Some random selection of patients with hard and soft stabilization splint.



Figure (4): Digital vernier caliper