

Comparative Evaluation of improvement in clinical symptoms in moderate TMD cases with the use of Advanced Light Force appliance- An in vivo study.

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Abstract: Introduction: There has been increase in number of TMD cases which may go undiagnosed and progress in severe form. There are various options for treating TMD one of them is ALF appliance .It delivers light and continuous forces when fitted in arches. This appliance mainly uses functional force for its working. ALF can improve position and function of tongue, airway dimensions, sleep due to clear airway, it facilitates breathing through nose and sinus drainage improving overall balance of facial bone. The use of ALF appliance has also been suggested in deprogramming the TMJ and help preventing aggregation of TMD symptoms in patients taking orthodontic treatment. But no such studies has been carried out to see its effect on TMD. Hence, a study is planned evaluating TMD's in moderate group described by Helkimo index and comparing the symptoms pre and postoperatively with ALF appliance. Materials and method: Patients seeking orthodontic treatment will be checked for any TMD's. Helkimo's index will be recorded. Mild to moderate cases as per Helkimo's index will be selected cases for study. Appliance is fabricated using flexible and resilient 0.025 elgiloy wire. Helkimo index will be obtained at different intervals for evaluating any changes in TMD symptoms. Conclusion: No such studies has been carried out to see its effect on TMD. Hence, a study is planned evaluating TMD's in moderate group described by Helkimo index and comparing the symptoms pre and postoperatively with ALF appliance.

Keywords: Temporomandibular joint disorder, Advance light force appliance, Helkimo index, moderate TMD cases.

INTRODUCTION

According to American academy of orofacial pain, TMD is defined as a collective term embracing a number of clinical problems that involve the masticatory musculature, the TMJ and associated structures or both.

Now-a-days there has been increase in the number of TMD cases and adults with pain in TMJ and related problem many of patients go undiagnosed and may convert into irreversible severe cases if the predisposing factors are present.

There are various clinical and radiographical methods for diagnosing TMD cases, and one of the easiest ways to diagnose and categorize a Temporomandibular disorder is Helkimo index. It includes both anamnestic component and clinical examination of dysfunction which categorizes the TMD as mild moderate or severe. so many method are there for treating TMD'S , such as orthopaedic stabilization, intraoral appliances, behavioural therapy, physiotherapy, pharmacological modalities and jaw exercise^[1] .

Advanced Light Force appliance introduced by Dr.Darick Nordstrom ^[2] .ALF has high degree of flexibility. Uninterrupted and continuous light force is applied on skull bone and dentition when fitted on maxilla and mandible. The use of musculature that is "Functional" force is the chief aspect of ALF to work to its fullest potential. This appliance uses mainly the treatment strategy by orthodontist and the tongue ("functional forces ") for its working. The Tongue will press on the ALF wire and the teeth and is a big part of the force and a "Functional" one at that. Position of tongue and lips are important for development of jaw in proper size so any alteration in them is biggest predisposing factor for sleep apnoea and TMJ problem. ^[2]

ALF can improve position and function of tongue, airway dimensions, sleep due to clear airway, it facilitates breathing through nose and sinus drainage improving overall balance of facial bone. ^[2].

The use of ALF appliance has also been suggested in deprogramming the TMJ and help preventing aggregation of TMD symptoms in patients taking orthodontic treatment.

Treatment time and method will be different for different cases depending on severity of the dental problem. The ALF may be a useful appliance in mild and moderate cases of malocclusion with some signs of TMD and is the preferred functional appliance because the light forces will not be able to cause much unwanted changes in the bony arches. ^[3]

It is also suggested use of ALF in TMD cases acts similar to Deprogramming splint may help prevent aggregation of TMD symptom in patients taking orthodontic treatment. Due to severe pain in TMD certain patients suffer from psychological stress and negativity in life so early intervention help in reducing this problems^[4]. Due to lack of support from local organisation and health service utilization problem gets aggravated and thus land up in handicapped situation for the patient to perform normal masticatory function^[5]. Early intervention is necessary for preventing any psychological problems. ^[6] Naqvi and Fating reported a Non-Invasive Approach towards the Management of a Long-Standing temporomandibular joint dysfunction^{[7][8]} .

NO studies have been found evaluating ALF appliance in managing TMD's known to us. Mild-Moderate are the case groups that can be effectively managed with intra-oral appliances. Hence, a study is planned evaluating TMD's in moderate group described by Helkimo index and comparing the symptoms pre and postoperatively with ALF appliance.

AIM AND OBJECTIVES:

AIM:

To evaluate and compare clinical symptoms using Helkimo's index in moderate TMD cases by using Advanced light force appliance after an interval of one week, one month, three month, six months.

OBJECTIVES:

1. To evaluate TMD symptoms before giving Advanced light force appliance by using Helkimo index.
2. To evaluate TMD symptoms after giving Advanced light force appliance by using Helkimo index after an interval of one week, one month, three months & six months .
3. To compare TMD symptoms before giving ALF appliance i.e. T0 with symptoms at one week ,1 month, 3months and 6 months after appliance delivery

INCLUSION CRITERIA:

1. Patients clinically diagnosed with TMD or any TMJ disorder.
2. Adult patients in age group of 18-35 yrs with mild and moderate TMD.

EXCLUSION CRITERIA

1. Patients with gross pathology of ear.
2. Patient with any systemic disease or any muscular dystrophies.
3. Syndromic Cases
4. Severe TMD cases
5. Severe skeletal Discrepancy.

Sample size:

Mean values are taken from article "Efficacy of appliance therapy on temporomandibular disorder related facial pain and mandibular mobility.

n = 26

There are total 2 groups pre-treatment and post-treatment

Hence 52 samples are required

Study design: It will be an interventional study.

SAMPLE PREPARATION:

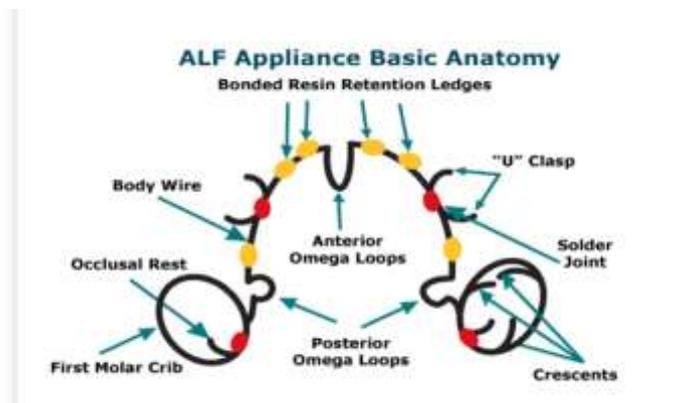
The study will be conducted in Sharad Pawar Dental College, in Department of orthodontics and dentofacial orthopedics in patient in the age group 20-50 and approval from ethical committee has been taken(Ref.No.DMIMS/IEC/AUG-2019/8286) Patient will be informed about the study and their consent will be taken. Careful history, clinical examination and radiographic examination will be done .For each patient, the Helkimo index will be obtained which will classify them as mild, moderate and sever cases from which moderate cases will be selected for study.

Based on subjective symptoms anamnesis index should be taken first by giving them questionnaire based on the different symptoms of dysfunction in the masticatory system which should be answered in yes/no.

Analysis according to anamnesis scale should be done and score should be given accordingly. Secondly clinical dysfunction index should be recorded and scores taken for the five symptoms was summed up. Each person had a total dysfunction score ranging from 0 to 25 points. Higher the score, the more acute/serious the disorder.

Appliance fabrication:

Then in moderate cases appliance is given. Fabrication of appliance should be done with flexible and resilient wire which will give continuous and light force. ALF is fabricated by elgiloy wire of 0.025 gauge. The appliance consists of a 0.025 Elgiloy lingual wire that extends around the lingual surface of the arch from molar to molar. Omega loops are incorporated into the arch wire. Crib in wire aids in retention in molar region and C shaped wires are soldered to the wire to assist in retention of the appliance in the upper anterior area of maxilla and further composite can be placed on few teeth to increase appliance retention. Second molar distalization if required then finger springs can be given at the distal ends of the wire. The way ALF is fabricated it shows that the ALF is a combination of many appliances all into one appliance.



Index will be obtained at following intervals.

T₀: Helkimo's index at time of case history.

T₁: 7 days after appliance delivery.

T₂: 30 days after appliance delivery.

T₃: 90 days after appliance delivery.

T₄: 6 months after appliance delivery.

Then T₀ will be compared with T₁, T₂, T₃ and T₄ for results.

Outcome/expected result : Can be used for early intervention in mild and moderate TMD cases. Also helps in improving airway and tongue position.

Discussion:

This appliance with myofunctional training exercise can able to place tongue on proper place for swallowing. ALF can stimulate transverse bone growth as seen in children due to chewing of solid and semisolid food. Through its gentle pressure to the tooth organ it will exert lateral force on it. It is kept for 24x7 in oral cavity. It cause neurological feedback loops that promotes more effective management of oral-motor function.

In this appliance due to design and placement of omega loops causes tongue to position upper and anterior portion of palate. As it also applies lateral pressure it will cause palate to assume proper transverse shape and size. Although ALF touches only four anterior teeth but it will promote space between all teeth. The Advanced Lightwire Functional Appliance may create the possibility of augmenting, enhancing, and decreasing the length of orthodontic treatment.

Conclusion:

No such studies has been carried out to see its effect on TMD. Hence, a study is planned evaluating TMD's in moderate group described by Helkimo index and comparing the symptoms pre and postoperatively with ALF appliance.

REFERENCES:-

- [1] Dworkin SF, Huggins KH, LeResche L, Von Korff M, Howard J, Truelove E, et al. Epidemiology of signs and symptoms in temporomandibular disorders: Clinical signs in cases and controls. *J Am Dent Assoc* 1990; 120:273-81.
- [2] Nordstrom D. ALF Appliance. <http://bit.ly/1fXdioQ> Published February 12, 2008. Accessed August 10, 2013.
- [3] The ALF creating facial beauty and balance by EDWIN DELZ, DDS
- [4] Gupta, Anurag, Pushpa V. Hazarey, Om P. Kharbanda, Virender S. Kohli, and Amit Gunjal. "Stress Distribution in the Temporomandibular Joint after Mandibular Protraction: A 3-Dimensional Finite Element Study. Part 2." *AMERICAN JOURNAL OF ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS* 135, no. 6 (June 2009): 749–56. <https://doi.org/10.1016/j.ajodo.2007.12.026>.
- [5] Shah, Shishir B., Shandilya Ramanojam, Pushkar K. Gadre, and Kiran S. Gadre. "Synovial Chondromatosis of Temporomandibular Joint: Journey Through 25 Decades and a Case Report." *JOURNAL OF ORAL AND MAXILLOFACIAL SURGERY* 69, no. 11 (November 2011): 2795–2814. <https://doi.org/10.1016/j.joms.2010.12.029>.
- [6] Shrivastava, Abhinav, Pushpa V. Hazarey, Om P. Kharbanda, and Anurag Gupta. "Stress Distribution in the Temporomandibular Joint after Mandibular Protraction: A Three-Dimensional Finite Element Study." *ANGLE ORTHODONTIST* 85, no. 2 (March 2015): 196–205. <https://doi.org/10.2319/091913-690.1>.

- [7] Naqvi, W.M., and T.B. Fating. "Temporomandibular Joint Dysfunction: A Non-Invasive Approach towards the Management of a Long-Standing Condition." *International Journal of Pharmaceutical Research* 12 (2020): 1131–34. <https://doi.org/10.31838/ijpr/2020.SP1.131>.
- [8] EL MADIDI, S. Major Factors Associated with Congenital Malformations in the Agadir Region of Morocco. *Journal of Medical Research and Health Sciences*, 3(8) (2020). <https://doi.org/10.15520/jmrhs.v3i8.238>