



SHORT COMMUNICATION

Customized petit type facemask for class III correction

Sourabh Agrawal¹, Roopak D. Naik², Anand K Patil³, Harshavardhan Kidiyoor⁴

¹Post Graduate Student, Department of Orthodontics, SDM College of Dental Sciences Dharwad, India

²Associate Professor, Department of Orthodontics, SDM College of Dental Sciences, Dharwad, India

³Professor & Head, Department of Orthodontics, SDM College of Dental Sciences, Dharwad, India

⁴Associate Professor, Department of Orthodontics, SDM College of Dental Sciences, Dharwad, India

ARTICLE INFO

Article history:

Received 21st July 2015

Accepted 10th Aug 2015

Keywords:

Petit type face mask, customized, class III, economic, patient compliance

ABSTRACT

Reverse pull headgear or facemask is one of the time tested methods for protraction of maxilla in growing patients. However since it is a removable appliance the treatment outcome is dependent on patient compliance which in turn is greatly influenced by the ease of wearing the appliance and minimizing the discomfort to the soft tissues while the appliance is worn. The commonly used prefabricated Petit type facemask scores low on compliance due to numerous factors namely difficulty in wearing the appliance, variations in size of chin between different age groups, sex variations and change in size and morphology of chin and forehead among different population groups. When these factors are neglected and the patient is over motivated or in other words forced by the operator to wear the appliance the patient may develop blisters on the chin and forehead due to inadaptability of the facemask. Moreover the prefabricated facemasks are expensive and are subjected to availability especially in remote areas of practice. To overcome these drawbacks we have come up with simple yet efficient way of fabricating customized Petit type facemask.

Introduction

Treatment planning of skeletal Class III malocclusion is influenced by various factors namely, growth status of the patient, facial divergence and patient compliance. Various treatment modalities available for class III correction in growing individuals include using orthopaedic force with facemask therapy/ chin

cup or growth modulation with functional appliances.¹⁻⁹ The outcome of these interceptive treatment modalities is further complicated by the unpredictable and potentially unfavourable nature of growth and so in most of the cases we are left to doing camouflage treatment or orthognathic surgery.

It is very important to utilize the growth potential of patient and the face mask therapy during the growing period of the maxilla plays an important role in the successful correction of maxillary deficiency.⁹⁻²⁴ But poor patient compliance and increased discomfort to the patient by using prefabricated Petit⁵ type of face mask can lead to loss of valuable growth period. The cost of the face mask and the availability of required size also need to be considered. Under these conditions custom made petit facemask for increased patient compliance, ease of adjustment and cost effectiveness is a viable alternative.

Previous techniques of fabricating customized facemask requires multiple appointments and are laborious.⁴ To minimize the cost and to increase its adaptation to facial morphology of a particular patient we have come up with simple yet efficient way of fabricating a customized facemask.⁴

Steps of fabrication:-

1. Make an Alginate impression of patient's forehead and chin.

Fig 1: impression of fore head and chin

2. Fabricate the wax spacer on stone cast after marking the forehead and chin area on cast.

Fig 2: placement of wax spacer on dental cast



Figure 1: Impression of Fore head and Chin

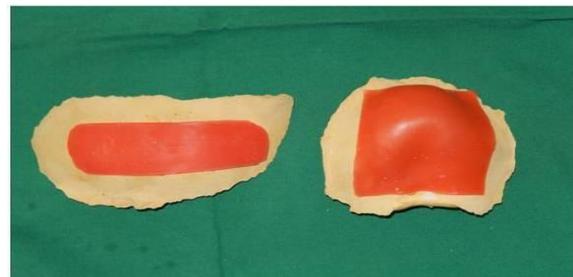


Figure 2: Placement Of Wax Spacer on Dental Stone Cast

3. Fabricate acrylic pad on wax spacer

Fig 3: fabrication of acrylic pad over wax spacer

4. Take a motorcycle spoke and bend it according to patient's facial contour

Fig 4: straight and bent motorcycle spoke

5. Incorporate the upper end of spoke into the fore-head pad and lower end with screw to the chin cup or chin pad. Thereafter mark a point at the stomion level of patient on the main spoke to solder the thinner bicycle spoke at stomion level, which acts as protraction hooks to engage elastics.

Fig 5: marking at level of stomion on cycle spoke to make protraction hooks

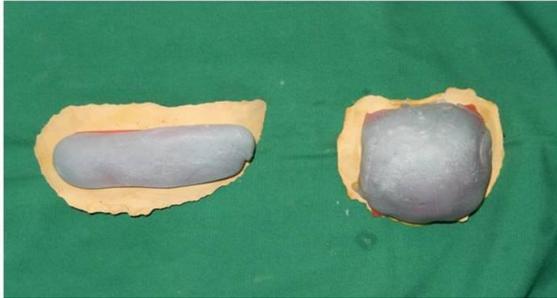


Figure 3: Fabrication Of Acrylic Pad Over Spacer



Figure 4: Straight And Bent Motorcycle Spoke

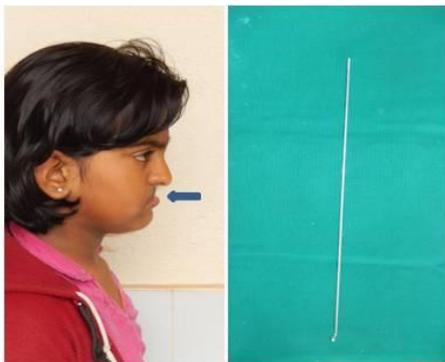


Figure 5: Making At Level Of Stomion On Cycle Spoke To Make protraction Hooks

6. Bend the cycle spoke at stomion level and make the hooks.

Fig 6: attachment of protraction hooks

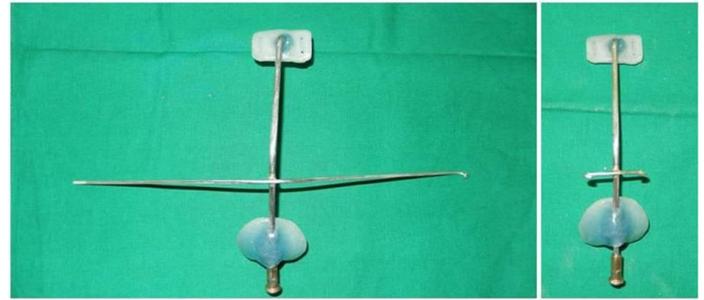


Figure 6: Attachment Of Protraction Hooks

7. Attach the sponge on to the chin pad and head pad using glue. Attach the head strap to the head pad after making four holes on head pad; attach the strap to the pad using strong thread.

Fig 7: attachment of soft sponge to the acrylic pads

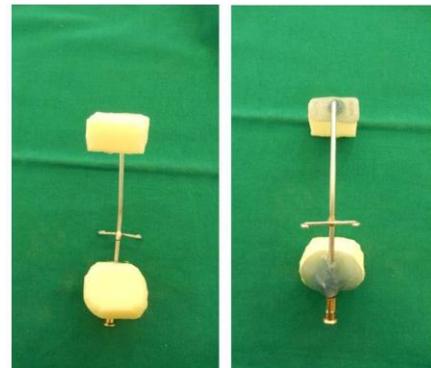


Figure 7: Attachment Of Soft Sponge On Acrylic Pads

8. Facemask is ready to deliver; the screw at the bottom of chin pad can be used to adjust the height of the chin pad.

Fig: 8 attachments of head strap and facemask is ready to deliver



Figure 8: Attachment Of head Strap and Facemask is ready to Deliver

9. Deliver it to the patient using appropriate elastics.

Fig 9: facemask delivered to patient



Figure 9: Facemask Delivered to Patient

Discussion

By fabricating the customized facemask with routinely available materials the clinician can improve the patient compliance as it is specifically designed to fit the individual it adapts properly according to the facial morphology of the patient and does not require any adjustment. The above mentioned appliance overcomes the most commonly encountered problems of blisters occurring on the chin, head and angle of the mouth seen routinely with the prefabricated Petit type

facemask.⁵ Furthermore the size differences of chin among males and females and between different population groups makes it difficult to adjust prefabricated face mask for wide range of population.

The custom made facemask presented here provides excellent fit for the patient at a very economical price. The appliance can be fabricated with minimal lab support without the requirement of repeated appointments as in the case of other custom made face masks⁴.

Conclusion

In this era of customization where even orthodontic brackets are customised and treatment modalities like Invisalign are gaining popularity, the orthodontist has to strive for efficient appliance with perfect adaptation. Custom made appliances using 3-D printing utilizing data from cone beam computer tomography may be the answer. The current idea of customization of facemask for patient comfort is a good beginning in this direction.

References

1. Hamamci N, Basanan G, Tumen E, Ozdemir E. Nonsurgical orthodontic treatment of an adolescent girl with Class III malocclusion and asymmetric maxillary narrowing. *Am J Orthod Dentofacial Orthop* 2008; 134:309-17.

2. Kim J, Viana M, Graber T, Omerza F, BeGole E. The effectiveness of protraction face mask therapy: A meta-analysis. *Am J Orthod Dentofac Orthop* 1999; 115:675- 85.
3. Gallagher R, Miranda F, Buschang P. Maxillary protraction: Treatment and post treatment effects. *Am J Orthod Dentofacial Orthop* 1998; 113:612-9
4. Orton H, Noar J. The Customized Facemask. *J Clin Orthod* Volume 1992 Apr 230- 235
5. Petit, H.: Adaptations following accelerated facial mask therapy, in *Clinical Alteration of the Growing Face*, ed. J.A. McNamara, Jr., K.A. Ribbens, and R.P. Howe, Monograph 14, Craniofacial Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor, 1983.
6. Figueroa A, Polley J. Management of severe cleft maxillary deficiency with distraction osteogenesis: Procedure and results. *Am J Orthod Dentofacial Orthop* 1999;115:1-12.
7. Chong Y H, Ive J C, Årtun J 1996 Changes following the use of protraction headgear for early correction of Class III malocclusion. *Angle Orthodontist* 66: 351–362
- 8/ Conte A, Carano A, Siciliani G 1997 A new maxillary protracto. *Journal of Clinical Orthodontics* 31: 523–530
9. Dellinger E L 1973 A preliminary study of anterior maxillary displacement. *American Journal of Orthodontics* 63:509–516
10. Hata S, Itoh T, Nakagawa M, Kamogashira K, Ichikawa K, Matsumoto M, Chaconas S J 1987 Biomechanical effects of maxillary protraction on the craniofacial complex. *American Journal of Orthodontics and Dentofacial Orthopedics* 91: 305–311
11. Pangrazio-Kulbersh V, Berger J, Kersten G 1998 Effects of protraction mechanics on midface. *American Journal of Orthodontics and Dentofacial Orthopedics* 114:484–491
12. Staggers J A, Germane N, Legan H L 1992 Clinical considerations in the use of protraction headgear. *Journal of Clinical Orthodontics* 26: 87–91
13. Sung S J, Baik H S 1998 Assessment of skeletal and dental changes by maxillary protraction. *American Journal of Orthodontics and Dentofacial Orthopedics* 114: 492–502
14. Ellis E III, McNamara JA Jr. Components of adult Class III malocclusion. *J Oral Maxillofac Surg* 1984;42:295-305.
15. Takada K, Petdachai S, Mamoru S. Changes in dentofacial morphology in skeletal Class III children treated by a modified maxillary protraction headgear and a chin cup: a longitudinal cephalometric appraisal. *Eur J Orthod* 1993;15:211-21.
16. Lim JK, Park YC. A study on profile change of skeletal class III malocclusion patients after wearing protraction headgear. *Korean J Orthod* 1995;25:375-401.
17. Kapust AJ, Turley PK, Rudolph DJ, Sinclair PM. Cephalometric effects of facemask/expansion therapy in Class III children: a comparison of three age groups. *Am J Orthod Dentofacial Orthop* 1998;113:204-12.
18. Tindlund RS. Orthopaedic protraction of the midface in the deciduous dentition. *J Craniomaxillofac Surg* 1989;17(suppl):17-9.
19. Tindlund RS, Rygh P, Boe, OE. Orthopedic protraction of the upper jaw in cleft lip and palate patients during the deciduous and mixed dentition periods in comparison with normal

growth and development. Cleft Palate Craniofac J 1993;30:182-94.

20. Aileni KR, Rachala MR. Early treatment of class III malocclusion with Petitfacemask therapy. Int J Orthod Milwaukee. 2011 Winter;22(4):41-5. PubMed PMID:22360081.

21. An Orthopedic Approach to the Treatment of Class III Malocclusion in Young Patients Volume 21 : number 09 : pages (598-608) 1987 James a. Mcnamara, jr., dds, phd

22. Jackson, V.H.: Orthodontia and Orthopaedia, J.B. Lippincott, 1904.

Ricketts, R.M.: The influence of orthodontic treatment on facial growth and development, Angle Orthod. 30:103-133, 1960.

23. Graber, L.W.: Psycho-social implications of dentofacial appearance, doctoral thesis, University of Michigan, Ann Arbor, 1980.

How to cite this article: Agarawal S, Naik D R, Patil A K, Kidiyoor H. Customized petit type facemask for class III correction. JOADMS 2015;1(2):3-8. Source of Support: Nil, Conflict of Interest: None declared