

Jack Screw in Regaining Mouth Opening in Postoperative Partial Trismus Due to Oral Sub-Mucous Fibrosis : A Clinical Report

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Abstract

Partial trismus and fibrosis will continue to be problems even following surgical intervention. In most instances there is either relapse of correction achieved or functional morbidity if proper post operative methodical follow up is not done. The condition is only improved with constant exercise. The more frequent and diligent the exercise regimen the more beneficial is the result. Recent research has shown that passive motion provides significant reduction in this type of inflammation and pain. Passive motion applied several times a day is more effective than static stretching. This article describes feasibility of jack screw commonly used for maxillary expansion to be deployed for home appliance for patient with post-operative partial trismus due to oral sub-mucous fibrosis.¹

Keywords: Jack screw, Trismus, Trismus appliances

Introduction

A typical expansion screw (Jack screw) consists of an oblong body divided into two halves. Each half has a threaded inner side that receives one end of a double ended screw. The screw has a central bossing with four holes. These holes receive a key which is used to turn the screw. The turning of the screw by 90 degree (i.e. one turn) brings about a linear movement of 0.18 mm. The pattern of threading on either side is of opposite direction. Thus turning the screw withdraws it from both sides simultaneously.²

Jack screw is one of the most common in removable appliances used for maxillary expansion.

Clinical Report

A 29 yr old female was referred to Dept of maxillofacial prosthodontics & Rehabilitation of V.Y.W.S. dental college & hospital, Amravati. Patient was operated surgically 2 months before for correction of oral sub-mucous fibrosis Type IV Grade A. Presurgical maximum interincisal opening was reported to be 10 mm. Patient was treated surgically with bilateral fibrotomy, bilateral corioidectomy & reconstruction with nasolabial flap. Post-surgical maximum interincisal opening was noticed to be 23mm.

Procedure

1. Maxillary & mandibular teeth index was taken with medium bodied elastomeric impression material (Dentsply)
2. Indexes were poured with dental stone & stone index cast were retrieved.
3. Area to be covered with acrylic was marked on labial & lingual surfaces of teeth on stone cast.
4. Separating medium was applied over teeth surfaces
5. A commercially available jack screw was interpositioned between two occluding surfaces of cast anteriorly & was properly oriented to long axis of teeth.
6. Self cure clear acrylic resin was flow gradually over labial surfaces, later extended over lingual surfaces.
7. Same procedure was performed for mandibular stone index cast.
8. Separation between two acrylic plates was made with disc bur if any acrylic was overflowed between two plates, the separation was tentatively to the thickness of green plastic which is usually provided commercially covering screw hole.
9. Complete separation is checked on both sides & green plastic covering screw is removed with disc bur.
10. Petroleum jelly was applied to teeth surfaces in patient's mouth & acrylic build up was performed on inner surfaces of both plates to match the vertical height of maximum inter-incisal opening
11. Trial in patient mouth is done after finishing & polishing of appliance.
12. Screw activation was performed by rotating the key into keyhole carefully & explained to patient
13. Each 90° rotation brings about linear separation of 0.18 mm between two acrylic plates.
14. Patient is advised to perform oral exercise at least 10 times a day for a period of 10 minutes and was advised to perform a turn of 90° per day.

A follow up of the patient was done after 1 month & inter-incisal opening was noticed to be 26mm against the initial of 23mm. Patient was later asked to perform two turns of 90° per day & after 20 days, the inter-incisal opening was found to be 29 mm.

Discussion

Since jack screw which provide constant amount of separating force between two arches which does not exceed the maximum tolerable force of muscle, scope for muscle guarding due to excessive stretching is limited which is very common in active stretching devices^{3,4,5}. The force applied by Jack screw in this case was only 7 gms & nature of forces were intermittent eliminating any ill-effect over underlying bone and root surface as forces were directed against occlusal pressure or biting forces which may go upto 11 kg (108 N) in incisor region.^{6,7}

Thus the appliance mentioned become cost effective alternative to commercially available costly devices. Since a single jack screw can only bring about the separation around 3-4 mm, frequent refabrication of appliance is advised to bring more amount of correction. Extension over posterior occlusal surfaces by acrylic plates & incorporation of more no. Of jack screws are encouraged.

Summary

Mechanical devices & oral physiotherapy play critical role in surgical post-operative cases of oral submucous fibrosis. In this clinical report feasibility of maxillary expansion jack screw was searched for regaining mouth opening & was found to be effective in not only for preventing the relapse of surgical correction but also improving the space regained within the limits of appliance.

References (For a complete list of references are available on request please mail us editor@healtalkht.com)

Legends

1. Pre Appliance Patient View
2. Pre Appliance Mouth Opening Measured With Divider
3. Pre Appliance Mouth Opening Noticed to be 23 mm.
4. Area to be Covered is Marked with Pencil & Separating Media is Applied.
5. Position of Jack Screw is Properly Oriented to Long Axis of Teeth.
6. Clear Autopolymerizing Resin Flowed Over Labial Surfaces of Maxillary Anterior Teeth.
7. Autopolymerizing Resin Extended Over Lingual Surfaces.
8. Autopolymerizing Resin Flowed Over Mandibular Teeth.
9. Separation Between Two Plates Achieved With Rotating Disc Bur.
10. Green Plastic Covering Screw Hole is Removed With Bur.
11. Finished & Polished Appliance is Tried in Patient Mouth & Screw Activation Is Explained to Patient.
12. Inter-incisal Mouth Opening After 1-month Noticed to be 26 mm Against the Initial of 23 mm.
13. Inter-incisal Mouth Opening After 1 & Half Month Noticed to be 29 mm.
14. Inter-incisal Mouth Opening After 1 & Half Month Noticed To Be 29 Mm

