**ABSTRACT**

Guard rail means a fence or bar constructed for safety at the edge of any potentially dangerous area. Oral cavity is a beautiful creation of nature where it experiences different habitual threat like tongue thrusting, thumb sucking, lip biting, etc. and if untreated there is chance of development of malocclusion. This case report delineates an innovative removable habit breaking appliance, named Sudipta kar’s guard rail appliance, designed to reduce or eliminate these kinds of habits.

**KEYWORDS:** Sudipta Kar, guard rail, removable, orthodontic appliance, multi utility

**KEY MESSAGES:** Guard rail appliance is an innovative multi utility appliance.

**INTRODUCTION**

According to Merriam Webster guard rail means a railing guarding usually against danger. This appliance is fabricated to prevent potentially dangerous i.e. deleterious oral habits. Literally deleterious means the things which is injurious to health, so, deleterious oral habits are one of the most frequent and important factors affects the normal growth and development of orofacial region during childhood and adolescence.[1] Deleterious oral habits like thumb sucking, tongue thrusting and lip biting, plays a major role in the development of malocclusions, as well as facial asymmetries. Finger and thumb sucking is common in children and is considered normal up to the age of 3-4 years. It’s persistence...
inhibit growth of the mandible, produce protrusion of maxillary anteriors and spacing lingualization of the mandibular anteriors as well as gastrointestinal disorders. Lower lip biting may inhibits normal growth of the mandible, causes hypertonicity of lower lip, and proclines the maxillary anteriors. Tongue thrusting is considered as a causative factor for spacing, open bite, and bimaxillary protrusion, and lip incompetence. Various interceptive appliances have been designed to prevent or diminish these kinds of habits. These appliances may be removable or fixed in nature according to the design of the appliance.

Case History
A 8-years-old girl accompanied by her parent reported to the Department of Pedodontics and Preventive Dentistry with a chief complaint of complex habit history like having thumb sucking, tongue thrusting and lip biting habit during leisure time and sleep successively. (Fig. 1, 2, 3) Parents had given the history of active tongue thrusting and thumb sucking by the child since her childhood and lip sucking was her recent development. They also expressed that she was unable to stop these kinds of deleterious oral habits even after generous counseling and repeated positive motivation from their part. The little girl was having convex and mesomorphic facial profile; symmetrical in nature. (Fig. 3) Intraoral examination revealed anterior open bite formation with proclination of maxillary anterior teeth with little retroclination of mandibular anteriors, Size of the tongue was also found normal. (Fig.1) Extraoral examination revealed incompetent upper lip with thick lower lip. Patient was in mixed dentition stage and some hypo calcified areas were also observed on some teeth. (Fig. 2) During tongue thrusting there was normal contact in posterior region and the posterior teeth revealed good intercuspation. (Fig. 2) It was also found that the tongue was placed forward to aid in anterior lip seal. Little bit of hyperactive mentalis activity was also observed. As these features were associated with well circumscribed open bite in anterior region it was diagnosed as a case of simple tongue thrusting habit. The child was counseled in the next visit regarding the harmful effect of these kinds of deleterious oral habits, but all the efforts were found unsuccessful. Then it was decided to place a newly designed appliance called guard rail appliance to stop these deleterious oral habits.

Fabrication of guard rail appliance
At first a simple Hawley’s retainer was fabricated with reverse labial bow and to Adams clasps. Then a simple innovative modification was done to fabricate a guard rail on this appliance. A structure was fabricated with of 19 gauge wire and hot cure acrylic smooth
horizontal stump round in cross section. It actually simulates a horizontal barrier. So this wire bending with rolled horizontal stump was named as guard rail variation. Vertical and horizontal length of the wire was adjusted according to inter canine width and the amount of open bite to be corrected. Then the prepared guard rail was fixed with prepared Hawley’s retainer. (Fig. 4 and 5) A kid sticker was incorporated into the palatal surface of the appliance to make it more attractive and acceptable to our kid patient. (Fig. 5) Then the appliance was thoroughly polished and delivered to the patient. (Fig. 6) Patient was trained to roll the guard rail with the tip of the tongue, close the lip, and then was advised to swallow. She was advised to perform this exercise for at least for 5 minutes, 6-8 times a day. Patient was advised to wear the appliance as much as she can except meal time. Post operative follow up was done in every one month interval. Patient discontinued the tongue thrusting, thumb sucking and lip biting habit within 6 months. (Fig. 7)

![Figure 1: Preoperative photograph](image1)

![Figure 2: Patient having tongue thrusting habit](image2)
Figure 3: Patient was also having lip biting habit

Figure 4: Basic wire bending for fabrication of guard rail

Figure 5: Fabricated guard rail appliance

Figure 6: Intraoral placement of guard rail appliance
DISCUSSION
The anterior tongue position may have an immense influence on the tooth position when it is at rest rather than the tongue pressure applied by the tongue during tongue thrusting. So the aim of our treatment is to train the position of the tongue to its normal superior position. Researchers found that children who sucks digit vigorously, but intermittently may not produce anterior proclination too much, but the children who give more pressure during sleep, can cause significant malocclusion. So intra oral retention time of the fabricated appliance is important. It was found that the spontaneous self-correction of malocclusion may occur after elimination of factors causing tongue thrust or thumb sucking habit. Many a times same appliance may improve open bite caused by both lip sucking habit and tongue thrusting habit. Various treatment modality also instituted to treat lip biting. A lip bumper was one of the successful design which may prevent lip biting. Blue grass appliance is a great fixed appliance to stop thumb sucking. It makes the children tired or upset at night. But it needs complex fabrication, preparation and adaptation of molar bands and expertise to handle welding and soldering machine. On the other hand removable appliances are considered easy to fabricate and design according to the need of the patient. Now a days we are entering into the modern era in which we are used to with multi-utility instrument like cell phone, multifunctional watches, calling tablet etc. So these ideas actually have influence me to design an easy to use, easy to fabricate, multifunctional habit breaking appliance. The present design is influenced by blue grass appliance. Here the innovative part is introduced by replacing costly six-sided machined from of teflon roller with a hot cure acrylic round stem and it is very easy to fabricate. If anyone considers the ideal requirements of orthodontics appliance, he should consider the mechanical, biological, and oral hygienic aspect as well as cost factor of the appliance. This innovative appliance support the mechanical aspects by rendering the self limiting force i.e. if the patient misses appointment force delivery may not occur. Biological aspects satisfied by not restricting normal growth of the children as the labial bow placed into the appliance is passive in nature. Oral hygiene
aspects are satisfied by easy self cleansing property of the removal appliance. Aesthetic aspects are not much satisfied by the appliance. Cost factor is also satisfactory because it is not so much Expensive, so affordable for the patient. Advantage of this appliance is, it can correct/prevent thumb sucking, tongue thrusting and lip biting habit with one simple design. It can be readjusted according to the need of the patient as it has a metal stock on both side of the guard rail. It can be bended buccally or lingually according to the persistence of the multiple habits. The disadvantage of this appliance may be it needs patient cooperation.

CONCLUSION
To achieve a fruitful result the diagnosis and treatment planning is very much important. No appliance should be labelled as punishment appliance. The dental surgeon should fabricate an appliance in such a way that it should be acceptable to a child patient in a friendly manner. For any removable appliance regular follow up is important.

REFERENCES


