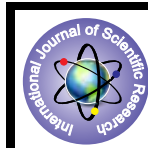


## Next Generation Thumb Guard:a Description of Simple Technique for Obtaining Impression of Thumb and a New Model of Thumb Guard.



### Medical Science

**KEYWORDS :** Thumb sucking, impression-technique, thumb guard.

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### ABSTRACT

*Thumb sucking being one of the most common oral habits prevalent in children, there exists plenty of literature on digit sucking habit and its management but scanty illustrations and description of the techniques used to obtain impression of thumb or digits. We describe a simple technique to obtain impression of digit involved in thumb sucking for fabrication of thumb guard using easily available dental gloves. The article describes the advantages of this impression technique. The authors have fabricated a thumb guard with a new designed material which has better compliance than conventional acrylic thumb guards. The article also describes the design of this new thumb guard emphasizing the function and advantage of each component.*

#### Introduction:

Digit-sucking is the common oral habit seen in children.<sup>[1]</sup> Digit sucking habit is a non-nutritive sucking habit prevalent from early fetal life continuing into childhood.<sup>[2]</sup> The direct pressure exerted by the digits on the teeth and alveolus can cause dental changes like increased overjet, increased overbite and posterior crossbites<sup>[3]</sup>.<sup>[4]</sup> It can also cause deformities of involved digits and nails.<sup>[5]</sup>

Response prevention and appliance therapy are the two types of "reminder therapy" that are commonly used to stop digit sucking habit.<sup>[6]</sup> Response prevention includes the application of bitter taste solution or covering the thumb by thumb guard, mitten, long sleeve gowns, elbow guards etc.<sup>[6,7,8]</sup>

Thumb guards, as a means of response prevention therapy have been widely used in cessation of digit sucking habit

A thumb guard is an appliance made of acrylic that is worn on the thumb or finger involved in sucking habit. In order to fabricate a thumb guard an impression of the involved thumb, fingers are made. There are no well-illustrated techniques in literature describing impression techniques for fabrication of thumb guards. The alginate impression of the thumb is usually made with free hand techniques or stock finger guards, special impression formers/trays made from molds of older finger guards available, or any small tumbler/container into which the thumb can be inserted. However the problem with free hand technique, is that if the child fails to keep the finger straight the impression becomes useless. We describe a simple, chair side, economical technique of making impression of the thumb using operating gloves readily available in all dental operatory.

**Case Report:** A three and half year old girl was brought to the department of Pedodontics with the chief complaint of forwardly placed teeth. A thorough history revealed that the child sucks the thumb of the left hand from infancy during both day and night time. She had an over jet was 6mm and overbite of 5mm and a distal step type of molar relation. A Steiner's analysis of lateral cephalogram suggested ANB angle of 6°, SNA 81°, SNB 74°, Mandibular plane angle 32°, Occlusal plane angle of 22°. Dental analysis showed upper incisor to NA angle of 22° and linear 5mm. Lower incisor to NB angle 28° and linear 5mm, inter-incisal angle of 62° (as in picture 1). The cephalometric analysis suggested both skeletal and dental class II malocclusion.

The standard protocols for thumb sucking involves no intervention of habit in children less than four years of age but in our case the child used to suck the thumb throughout the day and even in the night. The intensity of the practiced habit was severe

and had already caused changes in the facial skeleton and dental hard tissue. This led us to intervene the thumb sucking habit. Since the child had severe early childhood caries use of habit breaking appliance was ruled out (as in picture 2). The thumb sucking habit was intervened by the use of response prevention therapy with the help of thumb guard. The child was suitably rehabilitated for early childhood caries.

#### Technique for obtaining impression of the thumb involved in digit sucking habit:

A 6 sized surgical glove was placed over the hand of the child and markings were made to cover the desired length of finger over which guard had to be fabricated. The remaining portions of glove was trimmed (picture 3). A small hole was punctured on the tip of finger portion of the glove to allow the air to escape during impression making. The child's finger was coated with a layer of Vaseline to act as separating medium. Alginate impression material was mixed and inserted into the finger portion of the glove, using a squeeze on technique the glove finger was filled. The child was now asked to insert the finger into the glove (picture 4). In this technique the operator can easily visualize and orient the finger so that an appropriate impression is obtained. The model of the finger was obtained after pouring a stone cast. The undercut was blocked with dental plaster and a thermoplastic thumb guard was fabricated. An adjustable strap was fitted onto the wrist for securing the thumb guard in place (picture 5). The child was instructed to wear the thumb guard during the day and night.

#### Discussion:

The digit sucking habit in children below four years is considered non-interactable because most children abandon the habit spontaneously by the 3.5-4 years of age.<sup>[3]</sup> But in our case the parental concern and degree of malocclusion already warranted intervention. Hence impact of the habit should be considered as an important indicator for intervention along with frequency, duration and intensity of the habit than simply age.

The advantage of impression technique for obtaining impression of thumb used here not only is that it is made with dental gloves that are easily available in all dental operatories but also that the operator can visualize if it gets bent while making the impression and direct the child to hold the finger straight. Thus eliminates retake of impressions. This technique is also economical as it requires lesser quantity of alginate and is not messy. This technique can be easily followed in children aged four to ten years with a standard 6-7 sized glove and for older children with larger size glove. In patients with latex allergy a vinyl glove can also be used. This technique can also be used in cases when children suck more than one digit.

Success of the elimination of sucking habit largely depends on willingness to quit the habit, compliance towards the habit breaking appliance and positive reinforcement. <sup>[9]</sup>Wearing of the thumb guard is critical in elimination of the digit sucking habit. Acrylic thumb guard are bulky and non-complaint to use. Besides they can be easily removed from the fingers by the child in sleep or while awake. The thermoplastic thumb guard made under vacuum and heat snugly fit the finger compared to acrylic guard. The guard is secured to the wrist with the help of Velcro straps that can be easily punched onto the thermoplastic guard (in picture 6). The wrist strap and optimal coverage of EVA based guard facilitates easy movement of the finger at the finger joint hence does not hinder in child's routine activities during day time. The design and snug fit of the thumb guard makes it difficult for child to remove the guard in sleep. Hence this design is more successful in eliminating thumb sucking habit.

#### Conclusion:

This case report demonstrates that severity of practiced habit as more clinical indicator for habit intervention than simply the age. Secondly places on litrary record a well illustrated simple technique to procure impressions of digits. The thumb guards made from thermo formers have increased the compliance in our patients and have been successful in cessation of thumb sucking habit.

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