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Research Paper

Restorative Management of Microdontia - A Case Report

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Abstract:
"Conical tooth anomaly" is defined as those anomalies associated with volumes and shapes of the teeth, and as the malformation in which dental crowns are similar with cone and shape bluntly and in which mesiodistal crown size is smaller than cervical size. Although many treatment options are adopted for regaining the aesthetic structure and functions in such individuals, direct and indirect options are generally preferred. In this case report we have presented a patients presenting with "conical tooth anomaly" following the clinical and diagnosis of th is patient treated with direct composite resin.

Keywords*: Peg Lateral Incisor, Direct Composite Resin, Dental Aesthetic.*

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I. Introduction

They're known as "small teeth," "pointy teeth," "microdontia," or even "Dracula teeth!" Whichever spooky way you've heard them called, peg teeth are a dental condition where one or more teeth appear abnormally small compared to the normal teeth size. Although a relatively rare condition, peg teeth can occur in any patient, regardless of age and gender, although they are more common in children and teenagers.[1,2]

Typically, peg teeth are small, conical-shaped teeth caused by dental disorders like microdontia or tooth agenesis (meaning the roots of the teeth are shorter than normal). The lateral incisors (the teeth next to the front teeth) are most commonly affected by them, but they can occur in any part of the mouth. Primary and permanent teeth can suffer from peg teeth, sometimes affecting multiple teeth simultaneously.[2,3,4]

Often, patients seek solutions for their unattractive smiles because of aesthetics. However, that doesn't mean a pegged tooth won't adversely affect your dental health over time.[2] There is a greater risk of periodontal disease, gum recession, and eventual tooth loss among patients with peg teeth, so it's best to consult an orthodontist about treatment options for pegged teeth.[1,2,3]

Figure 1a,b: Preoperative clinical view.

Different factors, such as genetics, environment, and development, can affect the likelihood of ever having peg teeth:

1. The most common cause of pegged teeth is **genetics**. When a parent has pegged teeth, their children are more likely to develop them, too. Pegged teeth are also associated with other genetic conditions, including cleidocranial dysostosis and ectodermal dysplasia.[2]

2. It is also possible that **environmental factors** contribute to pegged teeth. For instance, if a mother contracts a viral infection or has a high fever during pregnancy, the teeth of her baby may be affected.[2]
3. The chances of pegged teeth increase if a baby's teeth **don't develop properly** in the womb. Trauma to the mouth can also cause them.[2]

Most of our patients do not have to worry about peg teeth because this rare condition typically affects children and teenagers. It has been found that less than 2% of the population experiences peg-shaped teeth, with women 1.35 times more likely to develop pegged upper lateral incisors than men.[2]
These are more common among Mongoloid people and women. The prevalence is more common on the left side of the maxilla[2,5,6]. In a study by Backman and Wahlin, the incidence of peg-shaped incisors was found to be 0.8% in 739 children[8].In another study by Chattopadhyay A, it was found to be 0.4 %[9].In a recent meta analysis the prevalence of peg laterals was 1.8%[7,8]. The prevalence has been reported to be higher than the prevalence of other developmental malformations.[9]

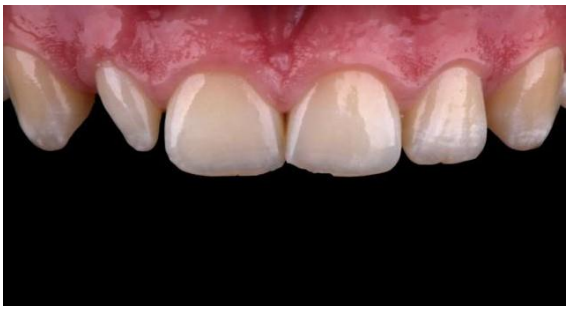

Figure 2: Preoperative clinical view.

The selection of treatment type is based on functional and esthetic requirements, need for extractions, the position of canines, and the potential for coordinating restorative and orthodontic treatment.[1,2] Treatment options include the following:
(1) Extraction of the lateral followed by orthodontic movement of canine and its recontouring

(2) extraction and replacement with single tooth implant-supported restoration or a fixed partial denture, and
(3) direct and indirect restoration of the peg-shaped laterals to develop normal tooth morphology after orthodontic alignment.[1,3]
The restorative techniques include direct composite restorations, porcelain laminate veneers, metal-ceramic restorations, and all-ceramic crowns as well as minimally invasive direct resin composite bonding veneers.[1,4,10,11] The present case report presents the restoration of unilateral peg laterals with Building direct composite layers after orthodontic alignment.

Case Presentation

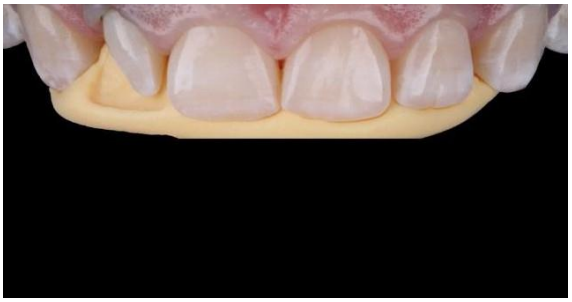

Figure 3 Testing the silicone guide

A 19 year-old female patient reported to the our dental clinic with the chief complaint of spacing and irregularly shaped tooth in her upper right front jaw region. Patient did not have any systemic diseases and intraoral examination revealed peg laterals and midline spacing was seen between maxillary central incisors. After thorough examination,treatment plan was finalized with two objectives:

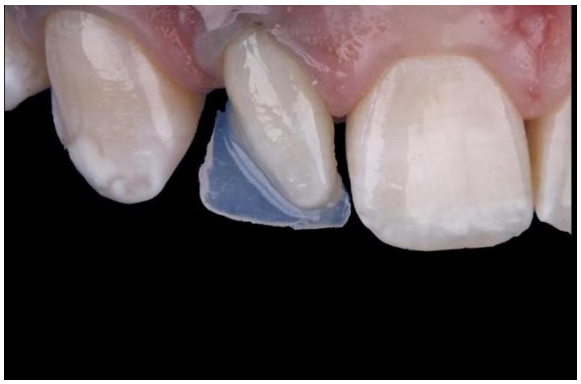

Figure 4: Edification of palatal wall and proximal walls with A2 enamel shade.

(1) Esthetic correction of peg laterals using direct composites using a putty technique and

(2) Orthodontic treatment for midline diastema. Vitality of the teeth were checked and radiograph did not reveal any signs of pathology. Based on all these evaluations, a direct composite restoration was planned.

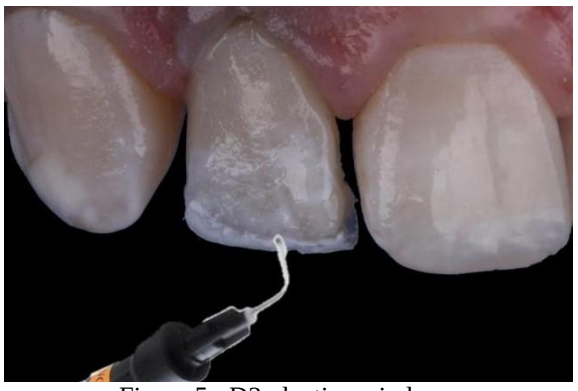

Figure 5: D2 dentin resin layer

A preliminary impression was made using dental alginate following which a diagnostic cast was obtained. A diagnostic wax up was done on the cast using modelling wax and a putty index was created (Figure-1a,b,2,3). The palatal half was then checked for the fit to serve as the reference guide to reconstruct palatal enamel. Incorporation of bevel is done following shade selection. Then etching is done with 37% phosphoric acid. After 15 to 30 sec it is washed for 5 seconds and dried. Then a single bottle bonding agent was applied and polymerized for 20 seconds with a LED light generator and resin based composite build up was done using putty index (Figure4). The composite resin was visible light polymerized for 40 seconds and any excess restorative material at the restorative margin was removed with a series of finishing burs, followed by polishing to a high luster using aluminum oxide discs.The pre and post restorative treatment images are shown in the figure 3,4 and 5. The patient was given

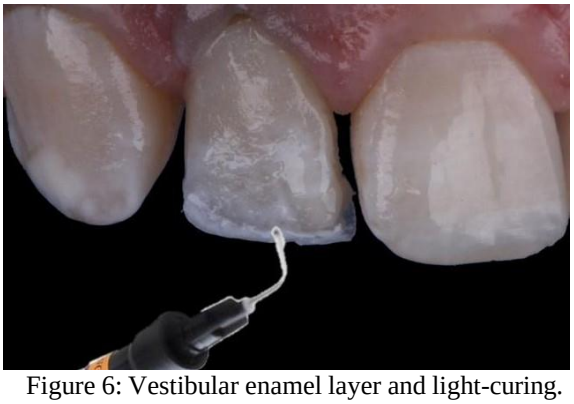

Figure 6: Vestibular enamel layer and light-curing.

oral hygiene instruction and informed for recalls Figure7,8).. At the 6-month recall the restorations were just polished using polishing discs.

II. Discussion

Between 2% and 5% of the general population have lateral incisors that are peg-shaped, and females are slightly more likely than males to have them.[1,2] However, several investigations have found that their bilateral incidence is slightly more common than their unilateral occurrence.[13,14] They are often distributed evenly on the right and left, unilaterally or bilaterally. When peg-shaped laterals erupt in the mouth, the patient may be upset because their teeth are not ideal or are too little in comparison to the other anterior teeth [7]. The diagnosis of a peg lateral is usually made clinically. [1]To resolve the condition, orthodontic treatment, direct composite bonding onto peg laterals, indirect composite placement, porcelain bonded to metal crowns, crowns bonded to teeth directly, lengthening of crown to improve gingival heights before direct bonding, extractions and implant may be used. The current case study illustrates how orthodontics along with restorative dentistry can interact to produce harmonies in the form of optimal symmetry, proportion and aesthetics [8,15].

Because hypodontia can create aesthetic, physiological and functional issues, early identification and clinical care of the disorder are crucial [1,9,16]. Orthodontic treatment may eliminate some of the periodontal and restorative issues that could occur in these patients as adults, preserving a range of treatment options in the future [10,17].

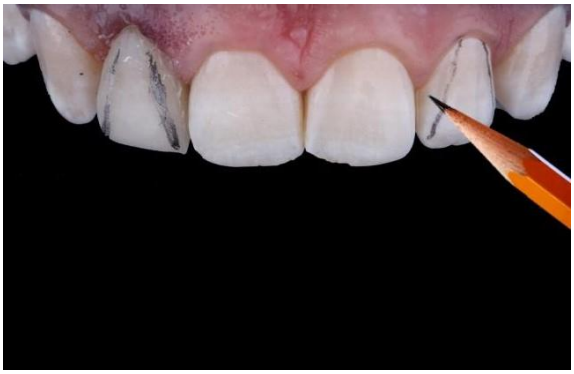

Figure 7: Polishing the restoration

Restoration of the conoid incisor, like all restorations, must respect the notion of a therapeutic gradient .[18]Indeed, there are many treatment options: direct restoration with composite resin, placement of composite or ceramic veneers, or peripheral coronal reconstructions. But it's important to remember that the treatment used to restore the aesthetics of the smile should always be as minimally invasive as possible.[1,19] In line with this philosophy, composite restorations are one of the most conservative therapies for healthy dental tissue; and therefore, this concept needs to be understood and mastered to enable a complete and informed choice of the options that are available to patients.[1,20] Direct composite resin restorations are the most conservative solution, as they are low in tissue cost, and have the advantage of being reversible, unlike indirect restorations [1,21].(Figure8)

Figure 8: Final result.

Direct composite bonding can easily change the emergence profile and alter the shape and length of the tooth. It can be repaired easily and also be polished and repolished to a high shine[1,17].The first step in direct resin bonding is to determine the shape and opacity. The shade of the tooth should be determined before the teeth are subjected to drying because dehydrated teeth become lighter in shade as a result of a decrease in translucency. The incisal third is lighter and more translucent than the cervical third, whereas the middle third is a blend of combination of incisal and cervical colors[1,18].As the shape, size and inclination of the teeth are predetermined using putty index, it facilitates the reconstruction of the tooth structure by acting as guide that enables the dentist to plan the procedure in detailwhich reduces the need for adjustment eventually.Besides, it is also useful in the determination of incisal edge thickness and cervico-incisal length, allowing easy insertion in the portion that needs to be restored[1,19]

The management of microdont teeth should consider the factors like the degree of microdontia; the patient's malocclusion; and patient's expectations from treatment.[2]The two primary treatment objectives in this case was to restore or replace the malformed crowns, and to close the diastema.[1] When diastema closure is performed, the dental midline and esthetic proportion of the individual tooth must be considered alongside the occlusal relationships. Direct or indirect restorative techniques can be used based on the amount of diastemata.[1,8]

The main disadvantage of such a technique, however, is the possibility of the veneers to chip and break. Additionally, discoloration and marginal leakage may occur by time.[2] Such restorations absorb stains easily, and therefore patients who smoke and have poor oral hygiene cannot maintain these restorations for a long time.]10,11] The annual failure rate of anterior composite restorations range 0.0- 4.1%.19 Patients should be informed that these restorations require periodic maintenance because the texture and shade of the material will change over time.[2,8,12]

The gingival margin level will also need to be taken into account so that it is harmonious with the rest of the anterior teeth and a balance may need to be achieved between the optimal incisal position and the desired gingival margin level.[2]

A conservative veneer technique is the application of resin composite without tooth reduction.[1,15 ,17,18,22] Resin composite veneers can be altered and repolished in situ, and this feature is very useful when subtle changes to the emergence angles are desirable.[23,24] Esthetic bonding with resin composite may be the most conservative approach for several reasons: sound tooth structure will not be removed ,the procedure may not require administration of local anesthetic, the procedure may be accomplished in 1 appointment, and treatment is relatively inexpensive than porcelain laminate veneers..[15,18,20]On the other hand ,resin composite restoration exhibit excellent physical properties, marginal integrity and esthetics.[1,25,26]

III. Conclusion:

A direct composite facing can be a successful alternative to more invasive, expensive procedures when restoring an unusually shaped incisor.This type of aesthetic dentistry represents one of the few occasions when pt can reasonably assess the quality of the work done. It is a source of job satisfaction when the operator alone is responsible for a restoration that improves a person's smile.

CONFLICT OF INTEREST : Nil
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ETHICAL CLEARANCE: Not required for case report manuscript.

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