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RESEARCH ARTICLE

CLOSURE OF MIDLINE DIASTEMA BY DIRECT COMPOSITE RESIN BUILD-UP USING PUTTY INDEX- A CASEREPORT

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Abstract

A common aesthetic concern among patient is maxillary anterior space or diastema. Labial frenulum, microdontia, mesiodens, peg-shaped lateral incisors, agenesis, cysts, habits such as finger sucking, tongue thrusting, or lip sucking, dental malformations, genetics, proclinations, dental-skeletal discrepancies, and imperfect coalescence of the interdental septum are some of the causes of midline diastema**.** For diastema closure there are a variety of therapy options. Many novel therapies have been applied, ranging from restorative procedures to surgery (frenectomies) and orthodontics for closure of diastema or a combination of procedures to meet the aesthetic and functional needs of patient'saesthetic. Recent advancement in direct dental composite resin allows dentists to do minimally invasive cosmetic dentistry that is both conservative and time-consuming. In diastema cases, direct composite resins give the dentist and patient entire control over the restriction and the construction of a natural smile. The purpose of this study is to present a case report of aesthetic management using putty index of maxillary anterior space, which includes the midline.

Introduction:-

The midline diastema could be space which presents between the maxillary central incisors.[1] The prevalence of diastema varies greatly with age and race. The space may be a standard growth characteristic during the primary and mixed dentition and customarily is closed by the time the maxillary canines erupt.[2]However, the diastema doesn't close spontaneously in some individuals causing a negative impact on the dental appearance and aesthetics.

Varied reasons for the occurrence of midline diastema can be genetic, physiological, dentoalveolar,tooth material-arch length discrepancy, presence of midline supernumerary teeth, proclination of upper labial segment, prominent frenum or habits like thumb sucking and tongue thrusting.[3]Diastemas may be treated during a multitude of wayincluding orthodontic closure, restorative therapy, surgical correction or multidisciplinary approach depending upon the actualcase and also the aetiology of diastema.[4]

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A carefully developed differential diagnoses allows the practitioner to decide on the foremost effective treatment plan. Diastema based on tooth-size discrepancy are most amenable to restorative solutions.[5]Direct composite restoration has several distinct advantages, such as, conservation of tooth structure, reversibility of procedure, lower cost to patient and relatively easy addition or removal of materials when necessary.[6] Composite resins can duplicate the pellucid and opalscent details of the tooth accurately.They're the foremost material of choice, which provides a natural colour to teeth undetectable to human vision when applied with correct technique.[7]

The use of silicone index is one in allamong the biggest game changers in dentistry for several clinicians within the anterior composite build up. The palatal silicone index is an imprint of the wax-up through which required information is transferred into the mouth during treatment. Putty index perfectly defines the sagittal dimensions, the length, andthe incisal edge position of the required final restoration, the incisal thickness, mesial and distal line angles, the labial curvature of the restoration. Hence, the practitioner can fully target the application of composite layers.[8] Closing alarge diastema is reported to have two major difficulties: to close it without making the width of the central incisors out of pro- portion; and to avoid a ledge at the gingival aspect of the contact area that will be a plaque and food trap. Knowing these two reported major difficulties.

Thisclinical case describes a novel technique that helps the clinician to promote a diastema closure with appropriate width proportions supported on a previous wax up, avoiding an excess amount of composite resin that could lead to possible inflammation of the gingiva.[9]

Case Presentation

A 26-year-old female patient reported to the department of conservative dentistry and endodontics, Narsinhbhai dental College and Hospital N.P.D.C.HVisnagar, Gujarat with a chief complaint of midline spacing between her upper anterior teeth (fig.1[A, B])). The patient's spacing was causing her social embarrassment andloweringherpatient self-esteem.

Figure 1(A, B):- Pre-operative view.

On examination a space of around 1.5 mm existed between the maxillary central incisors and there was spacing between the right central and lateral incisor and furthermore all the upper incisors had relatively less mesiodistal

width and improper contours. After the discussion of the condition with the patient the following treatment plan was formulated.

Closure of midline diastema and overall smile build up using a direct composite build up using putty index. Informed consent was taken, and complete treatment plan was clarified to the patient. In first appointment, tray was selected, and c-silicone putty material was used to make preliminary impression and then diagnostic cast was obtained. A dental mock-up wax was used, and diagnostic wax up done on the cast and a putty index was created. (Figure 2,3) All the material that was unnecessary for the stability of matrix was removed using the scalpel. The fit of the putty index in the mouth was examined.

Figure 2:- Diagnostic cast with wax mock.

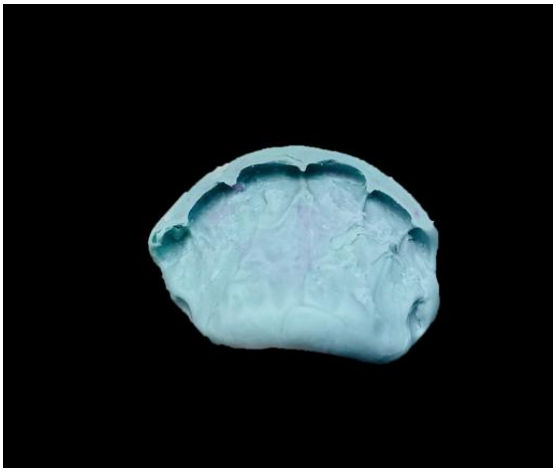

Figure 3:- Putty impression made.

Firstly, shade selection was considered A1 shade of (VITA Tooth guide 3D Master)for the teeth to be restoredwas done under natural daylight. In order tosimulate natural A1 shade outlook, the shade A1 bodyAnd B1 enamel composite resin (Filtek Z350 XT,3M Oral Care, Universal Restorative Capsule)were decided to be together used as layers. No preparations were performed before the restoration procedure All maxillary incisors were isolated with rubber dam (Kerr, USA). 37% phosphoric acid (Etching Gel, Kerr, USA) was applied on the mesial surface to be restored for 15 seconds, rinsed for 20 seconds, and dried with air slightly. Thenusingan LED light generator, a single bottle bonding agent (Adper Single Bond, 3M ESPE, USA) was applied and polymerized for 20seconds (Demi Led Light Curing System,Kerr, USA).

Proper placement of putty index in the mouth was checked. Putty index was removed and then a thin layer of A1 shade transparent composite resin was used palatially as enamel after that its placed into patient's mouth and cured for half minute (Figure 4). A rigid thin layer of composite bonded to the tooth was formed by carefully removing putty index as shown in picture.Which serves as a reference guide for further placement of composite.

Figure 4:- Putty index placed in mouth.

A thin layer of A1 shade opaque composite resin was placed roughly as second layer. B2 shade composite resin was used as dentin layer and a thin layer A1 shade was used as the top enamel layer (Figure 5[A, B]) Labial surfaces of the restorations were flattened by using a red banded knife-edge tip diamond bur (Acurata,Germany) Polishing discs (Ultra GlossCompositePolishingSystem,Axis,USA)were used for detailed polishing from rough to fine grains by using a low speed handpiece(DURAtec 2068D, Germany). The patient was motivated for oral hygiene.

Figure 5(A, B):- Post operative view.

Discussion:-

In aesthetic dentistry, these restorations offer numerous advantages that other possible treatment options like ceramic veneers and orthodontic treatment don't have. The direct composite resin restorations are placed in an exceedingly single visit.[10]Highly aesthetic restorations made up ofcomposite resins are now possible because to constant improvements in techniques, materials, and technology. One important aspect of composite resins is their capacity of mimic dental enamel, with overall survival rate above 88% up to 10 years.

On the opposite hand, the key causes of failure are chipping and colour mismatch, which may repeatedly be solved by repairing and polishing.[9] during this case the predictability of the direct technique that wouldenhance by producing a lingual incisal silicone index. Creation of a stratified restoration within the mouth with the identical form as a former wax-up is doablewith the putty index. This procedure is easy to perform, and it creates correct midline and optimal contact area but requires experience and skill. Rubber dam isolation is of utmost importance in placing composite restorations.[7,8] The patient seems highly satisfied after seeing the aesthetic result.

The patient was instructed to floss before tooth brushing regularly and to avoid pigmented liquids cause staining of restoration. The patient was advised for regular follow-up visits6 months

Conclusion:-

The clinical outcome of this case report demonstrates that palatal putty replicating for composite restoration can be a reliable procedure for direct composite veneering.In these cases, theminimally invasive cosmetic methodmetthepatient's aesthetic objectives. The natural tooth structure was attempted to be duplicatedascloselyas feasible.

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