Azkya N.Patria, Lateral Peg-Shaped Incisive Aesthetic Treatment with Indirect Veneer Restoration Using Ceramo Polymer Restoration. Journal of Health and Dental Sciences.e-ISSN 2807-3126 Vol. 01 No. 02: 121-130

LATERAL PEG-SHAPED INCISIVE AESTHETIC TREATMENT WITH INDIRECT VENEER RESTORATION USING CERAMO POLYMER RESTORATION

(*PERAWATAN ESTETIK PADA GIGI INSISIF LATERAL PEG-SHAPED DENGAN RESTORASI VENEER INDIRECT MENGGUNAKAN BAHAN CERAMO POLYMER)*

Azkya Patria[1*], Suzan Nusantari[2], Aprilia Adenan[3], Rasmi Rikmasari[3]
[1]Department of Prosthodontia, Faculty of Dentistry Universitas Jenderal Ahmad Yani, Cimahi, Jawa Barat Indonesia
[2]Dentist in Rumah Sakit Kesehatan Kerja Provinsi Jawa Barat, Rancaekek, Jawa Barat Indonesia
[3]Department of Prosthodontia Faculty of Dentistry Universitas Padjadjaran, Bandung, Jawa Barat Indonesia
*Corresponding author
azkyapatria@gmail.com

JHDS.unjani.ac.id/jite
Doi:10.xxxx/jite

Article History
Received:16/08/2021
Accepted: 03/09/2021

ABSTRACT

Peg shape is one of the abnormalities of dental anatomy, i.e. tooth size is smaller than average and tapered shape. These peg-shaped teeth are often found in the maxillary lateral incisors and third molars. The form on the lateral incisor often causes aesthetic problems because of its anterior position. One of the treatments for peg-shaped teeth is Veneer. Case report: 26 years old woman had a peg-shaped shape on both lateral incisors. Indirect veneer aesthetic treatment was performed using Ceramage to correct the form and cover the diastema to achieve better aesthetics. Wax-up is done to see the suitability of the shape and proportion of the Veneer. Patients get a visual picture of the expected

treatment results. The treatment results in *Ceramage* gave an excellent condition in improving the shape of the Peg-shaped incisor. The veneer colour resembles natural teeth, and the patient is satisfied with the treatment results. Ceramage can be used as a treatment option for anterior teeth with deformities. Ceramage Veneer is an alternative that can be done to improve the aesthetic appearance at a more economical cost for anterior teeth.
Keywords: aesthetics; indirect veneer; peg-shape

ABSTRAK

Peg shaped merupakan salah satu kelainan anatomi gigi, yaitu ukuran gigi lebih kecil dari normal dan bentuknya runcing. Gigi berbentuk pasak ini sering ditemukan pada gigi insisivus lateral rahang atas dan molar ketiga. Bentuk pasak pada gigi insisivus lateral sering menimbulkan masalah estetik karena letaknya di anterior. Salah satu perawatan untuk gigi peg-shaped adalah Veneer. Laporan kasus: Pada kasus ini, pasien memiliki bentuk peg-shaped pada gigi insisif lateralnya sehingga dilakukan perawatan estetik indirect veneer menggunakan Ceramage untuk memperbaiki bentuk dan menutupi diastema ini sehingga akan dicapai estetik yang lebih baik. Penatalaksanaan kasus yaitu wax up untuk melihat kesesuaian bentuk dan proporsi veneer. Adanya diagnosis wax up yang direncanakan pada awal perawatan, pasien mendapatkan gambaran visual dari hasil perawatan yang diharapkan. Pembahasan: Hasil perawatan didapatkan Ceramage memberikan bentuk yang baik dalam memperbaiki bentuk gigi insisif Peg shaped. Warna veneer pun menyerupai warna gigi aslinya dan pasien merasa puas dengan hasil perawatan. Ceramage dapat dijadikan pilihan perawatan pada gigi anterior dengan kelainan bentuk. Laporan kasus ini adalah Ceramage veneer merupakan suatu alternatif yang dapat dilakukan untuk meningkatkan penampilan estetik dengan biaya yang lebih ekonomis pada gigi anterior.
***Kata kunci**: estetik; indirect veneer; peg-shape*

INTRODUCTION

People of all ages pay more attention to their smiles and their overall appearance. Dental anomalies such as changes in shape, size, position, colour, or texture can harm the harmony of a smile. Various genetic and environmental factors can cause dental anomalies. Although the prenatal and postnatal periods are blamed for irregularities in the dimensions, position, and number of teeth, events in the prenatal period have the most significant influence on this defect.[1,2]

Peg shape is one of the abnormalities of dental anatomy where the size of the teeth is smaller than the average size, and the form is pointed. These peg-shaped teeth are often found in the maxillary lateral incisors and third molars. The shape of the post on the lateral incisor often causes aesthetic problems because of its anterior position.[3] One of the treatments for peg-shaped teeth is Veneer.

The Veneer is a dental treatment that aims to repair abnormalities or damage to teeth related to aesthetics. Veneer means covering (anything) with a layer of something else to give it a better appearance. According to Touti, the advantage of veneers is that they are resistant to plaque and can protect tooth structure due to the limited preparation of tooth enamel. [4,5]

Composite resin or porcelain is a material commonly used to make veneers. The latest materials veneers are micro-hybrid resin-based composites (MC), fibre-reinforced micro-hybrid resin-based composites (FMC), heat-pressed lithium disilicate ceramic (HPC), and computer-aided design (CAD)/computer-aided structure. Aided manufactured (CAM) lithium disilicate ceramic (CCC). One of the most commonly used micro-hybrid resin-based composites (MC) is Ceramage.[6] The case in this paper uses Ceramage as a peg-shaped veneer for teeth.

CASE REPORT

A 26-year-old female patient came to the Prosthodontics unit of *UNPAD Dental Hospital* with a complaint that her front teeth were small, pointed, and sparse. The patient wants to have a veneer made to improve the shape and aesthetics of his teeth. On extra-oral examination, there were no abnormalities. While on intra-oral review, a peg-shaped lateral incisor was found (Figure 1). In the periapical photo, 46 teeth were seen after endodontic treatment (Figure 2).

The patient's treatment plan was to make veneers on teeth 12 and 22 using Ceramage with a veneer design using a butt-joint finishing line.

Figure 1. Patient intra-oral photograph.

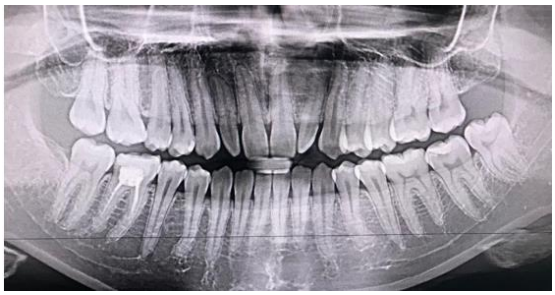

Figure 2. Panoramic radiograph.

On the first visit, an impression was taken for the modelling studies using alginate (Cavex CA37, Cavex Holland BV). The Netherlands) waxed upon the model of the study (Figure 3) and made the silicon index using putty (Elastomeric Impression Materials, Putty Nobelium, USA) according

to the wax-up made. The patient's tooth colour was also selected using a shade guide (Chromascop, Ivoclar vivadent, USA). From the selection results obtained, colour 110

Figure 3. Wax-up veneer.

On the second visit, veneer preparation was made on a mock-up temporary veneer on the patient. The first step is to reduce the labial part by about 0.5-0.7 mm using a marking bur, then trim it using a long fissure bur to get around the shoulder at the cervical end. Then proceed with preparation in the proximal part using a long fissure and form a window. The incisal were cut as much as 1 mm. The

practice results are then smoothed using a

fine finishing bur so that there are no undercuts, and the teeth are cleaned using

polishing paste. (Figures 4 and 5)

Figure 4. Veneer preparation on labial view.

Figure 5. Veneer preparation on palatal view.

Impression was taken on the prepared teeth using the dual step technique. The gingiva around teeth 12 and 22 was retracted using retraction sutures (Ultrapak #000, ultra dent USA). The first impression used putty (Express XT PuTTY soft, 3M ESPE, USA) using a thin layer of plastic wrap. After setting, remove it in the mouth, open the plastic, and do the

impression using the light body ((Express XT Light Body, #M ESPE, USA). The temporary Veneer was installed using a quick crown material (Protemp plus, 3M ESPE, USA). (Picture 6) and carried out making work models and processing in the laboratory (Figure 7)

Figure 6. The temporary Veneer on a patient.

Figure 7. The final result of ceramage Veneer.

At the third appointment, cementing Veneer was carried out using transparent resin cement (eCement, Bisco USA). Teeth 12 and 22 were etched using 35% phosphoric acid (select HV etch, Bisco USA) for 15 seconds, then rinsed, and the remaining water was sucked in using a high-volume evacuation until the preparation looked moist. Then apply to bond (All-bond Universal, Bisco, USA) using a micro brush on the tooth surface and then aerated using a three-way syringe. Apply resin cement to the Veneer, gently press it against the tooth, cure for 2-3 seconds, and remove excess cement. In the last treatment for 40 seconds, figure 8 shows the cemented Veneer. The patient was given OHI and recommended

for periodic follow-up. After one week, the patient came back for control (Figure 9).

Figure 8. Veneer after inserted on a patient.

Figure 9. One-week post-insertion control.

DISCUSSION

The Peg-Shaped lateral incisor is a dental anomaly that is possibly related to a defect in specific genes. There is a vital hereditary component, and these peg-shaped lateral incisors have been genetically linked to dental genes. The peg-shaped incisors have a marked reduction in diameter, extending from the cervical region to the incisal edge.[7]

The peg-shaped incisors are usually seen affecting the maxillary lateral incisors. The reported prevalence varies from 0.8% to 8.4% of the population. Prevalence rates were higher among Mongoloids, orthodontic patients, and women. Although most unilateral and bilateral lateral incisors are the same, the left-sided arch is twice as standard as the right side.[8] In the case of the patient with a peg-shaped incisor, she was a Mongolian woman. Both sides of the patient's lateral incisors had a peg-shaped anomaly where the left tooth was smaller than the right.

Aesthetic defects in patients with peg-shaped lateral incisors result from malformed teeth and diastema between the teeth. Therefore, there are two main goals of treatment: to restore or replace the deformed crown and close the diastema. When diastema closure, the tooth diameter and the esthetic proportions of each tooth must be considered in addition to the occlusal relationship.[9] Direct restorations such as composites and indirect restorations such as veneers and full crowns can be considered as treatment options. In this case, veneers were chosen because of reduced the tooth structure slightly compared to full crowns.

Veneer classifications—or lack thereof—are referred to as no-, minimal-, or conventional-preparation. They generate a significant grey zone of misunderstanding and miscommunication with patients and the dental community. Questions about completion lines, dental structure removal, and other issues might confuse practice if they go unanswered.[7]

Previously proposed preparation guidelines had flaws and inaccuracies that render them useless.[8] To help with diagnosis, treatment planning, patient education, consent and comprehension, and communication among dental team

members, and to provide realistic solutions to public requests for elective operations. A classification system is presented. [7]

LeSage proposed a new veneer classification system in the absence of widely accepted porcelain veneer tooth preparation. The technique was developed to help clear the grey area between traditional veneer preparation and no- or minimal-preparation veneers. On a case-by-case basis, this metric provides an accurate measurement system for quantifying tooth structural elimination. According to studies, dentists can provide patients with a better prognosis for the re-stored teeth when using a conservative approach, and significant tooth structure remains. [7,9]

Preparation and veneering are divided into three categories: reduction (also known as space needed, working thickness, or material room), the enamel volume left, and percentage of dentin exposed. For example, classifications I, II, and III necessitate a 70 per cent to 100 per cent enamel perimeter (both of which include other veneers.[7]

Different tooth preparation designs for ceramic veneers were proposed. However, the unattractive finish line of the Veneer near the incisal border of the tooth was a severe drawback.[10] Clyde, Gilmour, and Hui et al. described feather edge tooth preparation, initially with 0.5-1mm bevel preparation, intra-enamel tooth preparation with 1mm of incisal edge preserved, and overlapping incisal edge tooth preparation.[11] For better veneer translucency, Weinberg recommended a 1 mm incisal reduction with softened line angles.[12] A tooth preparation with a chamfer for suitable porcelain thickness, a rounded incisal edge, and a heavy lingual chamfer was described by Sheet and Taniguchi.[13] According to a poll conducted by Brunton and Wilson in England, the two most popular ceramic veneer preparation philosophies are facio-incisal bevel and incisal wrap preparation.[14]

Jankar et al. [10] compare and evaluate the fracture resistance ceramic veener with three different incisal preparations: **Group 1:** No Incisal reduction with facio- incisal bevel. **Group 2**: 1 mm incisal reduction with a butt joint. **Group 3**: 1 mm incisal reduction with 1 mm height of Palatal chamfer). The result showed that Group II had more excellent fracture resistance than Group I but less than Group III. In this case, we use the butt-joint finish line.

The incisal design of the Butt joint nevertheless allows for the maintenance of the peripheral enamel layer along all edges. Enamel rods on the palatal surface of central incisors approach a 90-degree angle with the tooth's long axis. To generate a more effective enamel etched surface, prismatic

and interprismatic mineral crystals must be removed. The butt joint incisal design allows for tooth preparation with a palatal finish line at an angle with the tooth surface more than 90 degrees and without excessive lowering of the thickness of the palatal ceramic at the tooth restoration margin.

A porcelain veneer is the primary choice of veneer material, especially for anterior teeth. Porcelain veneer has high abrasion resistance and colour stability. In addition, the colour, shape, surface and individual characterization properties through internal and external staining, combined with the fact that these restorations can be different colour corrected during cementation with unique cement colours, make them an attractive but expensive treatment option.[10]

Another restorative material that can be chosen in the manufacture of veneers is Ceramage. Ceramage is a micro-ceramic polymer system with 73% zirconium silicate filler (PFS-progressive fine structure filler) supported by an inorganic polymer matrix containing Urethane dimethacrylate and Urethane diacrylate. Ceramage combines outstanding hardness and fracture resistance. Ceramage ensures natural colour reproduction to create restorations with natural aesthetics, excellent polishability and high plaque resistance. Ceramage can be used on temporary bridges, and fibre reinforcement on Ceramage materials can increase the durability of temporary bridges.[11-14]

Extra-orally produced indirect composite restorations allow the dental technician to more easily establish the desired occlusal and cosmetic prescription for the clinician and patient.[15]

Research conducted by Xin et al.[16] evaluated the clinical status of two different veneer restorations. It concluded that marginal adaptation, sensitivity and gingival health did not differ between Ceramage and Empress. It was supposed that both could be used as restorative materials for anterior teeth that require good esthetics. Patients choose to have veneers made using Ceramage because the costs incurred are much more economical apart from the advantages mentioned above.

The durability and strength provided by bonding techniques enable the cementation of relatively conservative restorations. Bonding allows indirect restorations, such as indirect resin composite palatal veneers, to be retained when they would otherwise be lost due to a lack of standard preparation features.[15]

Long-term evidence supports the use of multi-step resin composite cements for bonding. Newer self-etch adhesives and self-adhesive resin composite lutes, on the other hand, appear to be promising in terms

of simplicity of use and potential benefits. [15]

Understanding the physical and aesthetic features of the systems available is critical, as is ensuring that they are utilized according to the manufacturer's instructions. Deviation from these criteria could harm bond strength.

The colour of the cement used affects the final colour of the teeth. Research conducted by Xing et al.[17] stated that cement colour's effect on the final veneer colour is related to the thickness of the ceromer material. In Ceramage the translucency parameter increases as the thickness decreases. The considerable translucency facilitates light transmission in the Ceramage, resulting in the cement colour's visible impact on the final veneer colour. A study by Sun Juan et al. l showed that spectral transmittance decreased with increasing thickness.[18] In this case, transparent resin cement is used to reduce the colour effect of this cement.

CONCLUSION

Ceramage is a more economical option than porcelain. Ceramage combines natural colour with good strength and elasticity and is recommended for aesthetic restorations.

CONFLICT OF INTEREST

We declare that there is no conflict of interest in the scientific articles.

ACKNOWLEDGEMENT

Our gratitude goes to the professionals who have helped research and draft papers.

REFERENCES

1. Townsend C. Respective surgery: An esthetic application. UK: Quintessence Int.; 1993. 535–42. p.
2. Uslu O, Akcam M, Evirgen S, Cebeci I. Prevalence of dental anomalies in various malocclusions. Am J Orthod Dentofac Orthop. 2009;135(1):328–35.
3. Lim CC. Case Selection for Porcelain Veneer. Quintessence Int (Berl). 1995;26:311–5.
4. Adenan A. Seleksi Kasus-kasus Veener Porselain. Fak Kedokt Gigi UNPAD. 2011;66(July):37–9.
5. Eni L. Restorasi Keramik secara Indirect. Maj Kedokt Gigi. 2008;23(1).
6. Zhang H, Lu P, Du W, Jiang T. Comparison of Fracture Load and Surface Wear of Microhybrid Composite and Ceramic Occlusal Veneers. J Prosthodont. 2020;29(5):387–93.
7. LeSage B. Establishing a Classification System and Criteria for Veneer Preparations. Compendium. 2013;34(2):104–16.

8. Gürel G. Predictable, precise, and repeatable tooth preparation for porcelain laminate veneers. 11th Edit. UK: Merriam-Webster.; 2008. 17–26 p.
9. Edelhoff D, Sorensen J. Tooth structure removal associated with various preparation designs for anterior teeth. J Prosthet Dent. 2002;87(5):503–9.
10. Jankar A, Kale Y, Kangane S, Ambekar A, Sinha M, Chaware S. Comparative evaluation of fracture resistance of Ceramic Veneer with three different incisal design preparations - An In-vitro Study. J Int Oral Heal. 2014;6(1):48–54.
11. JS C, A G. Porcelain veneer: a preliminary review. Br Dent J. 1988;164(9):9–14.
12. LA W. Tooth preparation for porcelain laminate. N Y State Dent J. 1989;55(1):25–8.
13. G S, T T. Advantages and limitations in the use of porcelain veneer restorations. J Prosthet Dent. 1990;64(4):406–41.
14. Burton P, Wilson N. Preparations for porcelain laminate veneer in general dental practice. Br Dent J. 1998;184(1):553–6.
15. Hansrani VK, Laverty D, Brunton P. The use of indirect resin composite restorations in the management of localized anterior tooth wear: A clinical update part 2. Dent Update. 2019;46(9):812–6.
16. Yi-xin B, Rong S, Yu S. Clinical evaluation of two different veneers in the restoration for aesthetic teeth. J Harbin Med Univ. 2009;
17. Xing W, Jiang T, Ma X, Liang S, Wang Z, Sa Y, et al. Evaluation of the esthetic effect of resin cements and try-in pastes on ceromer veneers. J Dent [Internet]. 2010;38(2):87–94. Available from: http://dx.doi.org/10.1016/j.jdent.2010.05.007
18. Juan S, Dan S, Yun L. Study on spectral transmittance of Ceramage Veneer. CAJ. 2011;2(4):22–8.