Veneering an upcoming trend - A Review

Type of article: A Review
Running title: Veneering an upcoming trend

Aishwaryah Ravisankar
Undergraduate student,
Saveetha dental college,SaveethaInstitute of Medical and Technical Sciences
Saveetha University

Manish ranjan
Senior lecturer
Department of conservative dentistry and endodontics
Saveetha dental college, Saveetha Institute of Medical and Technical Sciences
Saveetha University

L.Leelavathi
Senior lecturer
Department of public health dentistry
Saveetha dental college, Saveetha Institute of Medical and Technical Sciences
Saveetha University

Corresponding author
L. Leelavathi
Senior lecturer
Department of public health dentistry
Saveetha dental college,SaveethaInstitute of Medical and Technical Sciences
162,poonamalle high road,
Tamilnadu, india

Word count:2437

***Abstract*: Cosmetic dentistry is more popular than ever these days. Perfect smile plays an important part of personality. This can be greatly achieved with the veneering technique. Veneer is a layer of thin ceramic or composite material that is fixed to the outer surface of the tooth with adhesive Veneers are bonded to the front surface of the tooth changing their color, shape, size or length. Veneers give a natural, healthy and shiny look to the teeth improving the personality of a person. The current literature was reviewed to search for the most important parameters which determine the long-term success, correct application, and clinical limitations, various designs of different types of veneers.**

***Keywords*: Veneers, Feldspathic veneers, Porcelain laminate veneers, luting cements, aesthetics.**

Introduction

Esthetic dentistry is one of the most integral part of everyday practice in dental clinic. With increasing amount of patient demands, esthetic dentistry has also become a challenging job for dental profession.[1] Currently, the use of adhesive technologies makes it possible to preserve as much tooth structure as is feasible while satisfying the patient's restorative needs and aesthetic desires. With advancements in the usage of indirect restorations, clinicians have the ability to choose a material and technique that allows the most conservative treatment which will satisfy the patient's aesthetic, structural as well as biologic requirements; and has the mechanical requirements to provide clinical durability.[2]

Veneers are thin laminates which usually cover the visible surface of the teeth or the surface of the teeth which is seen when we smile and talk (the "facial" surface). Veneers can be made up of porcelain, which are produced in a laboratory and bonded to the teeth at a separate appointment from the preparation appointment. Feldspathic veneers and Porcelain laminate veneers have undergone significant amount of evolution. Nowadays, their use has expanded beyond a simple covering for anterior teeth to include coverage of coronal tooth structures. Feldspathic veneers are created by layering glass-based (silicon dioxide) powder and liquid materials. Veneers can also be made up of composite resin filling material, which can either be made in a laboratory and bonded on at a later date (like porcelain veneers or it can be built directly onto the tooth by the dentist.[3]

Veneers can be indicated in these following conditions like stained or darkened teeth,hypo calcification, mutiple diastemas, peg laterals, chipped teeth ,lingual positioned teeth , malpostioned teeth which does not require orthodontic treatment . Veneering is contraindicated in conditions like insufficient tooth substrate, labial version excessive interdental space which requires orthodontic treatment, poor oral hygiene or caries, parafunctional habits like clenching or bruxicism.[4]

The translucency of the material is contributed by the presence of two materials and the material should be used in really small quantities. The sintered feldspathic porcelain and pressable ceramic are used for the veneering purpose. Computer-aided manufacturing technique is used in recent trend for the manufacturing purpose. Ceramics can vary from being very translucent to very opaque. In general, the ceramic will appear more translucent when the microstructure of the ceramics is glassier ; The more crystalline the ceramic is the more opaque it looks.[5][3]

Cosmetic dentistry branches includes veneering , Tooth reshaping which involves removing a part of the enamel to improve the appearance of the tooth,tooth-bleaching options using peroxide based bleaching agents, Laser whitening is a teeth whitening technique in which gums are covered with rubber and a bleaching chemical is applied on the teeth, Gum lifting which is raising or whittling away at tissue and/or bone to lengthen teeth and beautify gummy or horsy grins. Veneering is one of the most important branches in the cosmetic dentistry.[6]

History of veneering

Before the invention of dental veneers there was only two options when the teeth surface was damaged either to leave as it is or it is have it filled. However a Californian dentist in 1930 called Charles pincus created the veneers fot the first time. These were predominantly used to improve the looks and smiles of Hollywood actress and actor. The veneers chipped and were broken because the poor material quality in longer use (2-3 months). In 1982 composite veneers were introduced which had better longevity than the previously used veneering material.[7]

Dessign for veneering

A.Incisal Chamfer Preparation (Interlock prep)

The incisal edge is not reduced in length. Incisal chamfer type of preparation is prefered for cuspal tips. This preparation helps in preservation of the natural guiding palatal surface of the tooth, which has great functional importance. An additional space has to prepared using a tapered diamond bur is used to create chamfer in the incisal facial margin for the porcelain that has to be adopted in the incisal region.

B. Incisal Butt-Joint Preparation

0.5 mm depth cut grooves s prepared in the incisal edge. Using the tapered diamond the remaining incisal tooth structure is removed . Facial incisal line angle is rounded which leaves a butt-joint margin along the lingual incisal edge. The incisal reduction should be 0.5 mm-1.0 mm. This type of preparation is done in order to increase the length of the tooth.[8][4]

C.Incisal Lingual Wrap Preparation

0.5 mm depth cuts in the incisal surface of tooth is prepared . Incisal surfaces reduced in a manner similar to incisal butt-joint preparation.The mesial incisal and the distal incisal corners an additional 0.5 mm is reduced . Then using a diamond bur, the incisal chamfer is extended to the palatal surface. The palatal chamfer should be a straight line from mesial to distal aspect. All incisal edges should be rounded.[9] The lingual chamfer line on the wraparound preparation should be above or under the centric lingual contacts to avoid occlusal contact on the interface between porcelain and tooth structure. Contact area should be present either on all the tooth surface. This preparation is considered one of the most propounds techniques for various reasons. It can be used in most patients and can be easily fabricated by the technician and easily handled by the dentist due to positive seating on delivery . [10]

Direct method of veneering by composites

Dental composite resins is a type of synthetic resin which is being used in dentistry as restorative material. Composite resins are most commonly composed of Bis-GMA and dimethyacralate monomers like TEGMA,UDMA,HDDMA, a filler material such as silica and a photoinitiator . [11]A composite technology that combines the use of the rigid polyurethane with chopped glass fiber to create a material capable of replacing steel or cast iron , as well as a new process involving vacuum assisted injection that could help with retrofitting of insulated panels can improve the longevity of the composites.[12]

Composite Veneers helps in improving the shape, color, alignment, position, and in certain cases it also below in improving the texture of the teeth to make them appear more aesthetically pleasing and attractive. Normally the composite veneering can be completed in one visit and require very little or no preparation (drilling) to the teeth indicating they are less destructive and more preservative than conventional porcelain veneers.[13] Composite veneering have added advantage of better esthetic results, patients comfort , easy application in comparison with porcelain veneers [14].

Dino re, Gabriel Augustine , Maesimo amato , Giacaro rival and David Augusti conducted a study on " esthetic rehabilitation of anterior teeth with laminate composite veneers " in 2014 which states that there is no significant difference in the survival rate of composite (97%) and ceramic (100%) veneers; on the other hand,the resin materials showed increased surface quality changes such as minor voids, defects and slight staining at the margin. In addition, the survival rate and clinical performance of composite or ceramic laminate veneers were not significantly influenced when bonded onto intact elements or onto teeth with preexisting composite restorations.[15]

S.sunitha , dhakshini conducted a review on " esthetics of veneers " which again did not not show much significant changes in the esthetics either on usage of porcelain or composite veneers . The porcelain veneers required additional tooth preparation which will damage the enamel .[16]

Different kind of composite Veneers

Composite alumina

Composite alumina is composed of 85% aluminum oxide which in turn contains 2.5 Micrometer micro crystals . This type has a higher strength and fracture toughness.[17]

Composite zirconia

It is composed of 67% aluminium oxide and 33% stanous fluoride . This material has increased flexural strength and higher fracture toughness.[18]

Composite spinell

It is used as a alternative for composite alumina which is proved to have the highest amount of translucency when compared to all the other types .[19]

Luting cements for veneers:

The delivery of the definitive prosthesis is limited to the precise procedure which includes the use age of luting agents. Proper selection along with appropriate manipulation of the luting agent plays an important role in the long term success of the veneers .

Resin modified glass ionomer:

Resin modified glass ionomers are formed by replacing a part of the polyacrylic acid by conventional glass ionomer cements and hydrophilic methacrylate monomers.These dual- or tri-cured materials are popular luting agents and provide slightly greater bond strengths and release greater amounts of fluoride compared to conventional glass iono- mer cements.[20]

RMGI cements are the ones that are most importantly used for the purpose of cementation of full-cast crowns, well-fitting porcelain-fused-to-metal crowns, and high-strength (eg, zirconia, alumina) ceramic restorations.[21]

Conventional ceramics :
There are two types of conventional ceramic feldspathic conventional ceramic and reinforced conventional ceramic.
Two types of luting agent are used for conventional ceramic materials. These are dual-cured (DC) and light-cured (LC) resin cement. LC cements have showed increased advantages in which there is increased working time for luting, hence the ability to remove excess cement is facilitated, which in turn reduces finishing time. DC cements traditionally are used when ceramic thickness does not allow light penetration for maximal conversion of the luting cement.when the ceramic layer is thick, the LC cement do not reach the level of micro hardened even during maximum cure. Disadvantages of DC cements include porosity from mixing, reduced working time, decreased degree of conversion, and color instability due to amine degradation.[22]

Cementation of high strength ceramic:
Resin-modified glass-ionomer cement is the luring agent that can used for a excellent retention purposes and least technique sensitive . Alternative luting agents for these restorations include phosphate-monomer–containing resin cement, conventional resin cement, resin-modified glass-ionomer cement, glass-ionomer cement, or zinc-phosphate cement.[23]

Conclusion:
Composite veneering has gained great popularity in this generation, where everyone wants a perfect Smile. Composite veneers have added advantage to porcelain veneers because it requires minimum tooth reduction and also the entire procedure can finished in single appointment.

Reference articles

[1] Pini NP, Aguiar FH, Lima DA, Lovadino JR, Terada RS, Pascotto RC. Advances in dental veneers: materials, applications, and techniques. Clinical, Cosmetic and Investigational Dentistry. 2012;4:9.
[2] Giordano R, McLaren EA. Ceramics overview: classification by microstructure and processing methods. Compend Contin Educ Dent. 2010 Nov;31(9):682-4.
[3] MDSMDACUVARMA AR. Evaluation of Esthetic Rehabilitation of Teeth with Severe Fluorosis Using Direct and Indirect Laminate Veneer: A Case Report. Biology and Medicine. 2016;8(7):1.
[4] Korkut B, Yanıkoğlu F, Günday M. Direct composite laminate veneers: three case reports. Journal of dental research, dental clinics, dental prospects. 2013;7(2):105.
[5] Minoux M, Serfaty R. Vital tooth bleaching: Biologic adverse effects—A review. Quintessence international. 2008 Sep 1;39(8).
[6] Sun G. Esthetic rehabilation of anterior teeth. The journal of dental Clinics of North America. 2000 Oct. 44 (4): 831–850.
[7] Bugaighis I, Karanth D, Borzabadi-Farahani A. Tooth size discrepancy in a Libyan population, a cross-sectional study in schoolchildren. Journal of clinical and experimental dentistry. 2015 Feb;7(1):e100.
[8] Grauer D, Heymann GC, SWIFT J, EDWARD J. Clinical management of tooth size discrepancies. Journal of Esthetic and Restorative Dentistry. 2012 Jun 1;24(3):155-9.
[9] Barker, Olivia (18 January 2008). Patients smile at getting long in the tooth USA Today. 24 September2015. 2:56
[10] Re D, Augusti G, Amato M, Riva G, Augusti D. Esthetic rehabilitation of anterior teeth with laminates composite veneers. Case reports in dentistry. 2014;2014.
[11] Ferracane JL. Resin composite—state of the art. Dental materials. 2011 Jan 1;27(1):29-38.
[12] Gresnigt MM, Kalk W, Ozcan M. Randomized clinical trial of indirect resin composite and ceramic veneers: up to 3-year follow-up. J Adhes Dent. 2013 Apr;15(2):181-90.
[13] Lal SM, Jagadish S. Direct composite veneering technique producing a smile design with a customised matrix. Journal of conservative dentistry. 2006 Jul 1;9(3):87.
[14] Newton fahl. The esthetic composite anterior single crown restoration. The Esthetic Chroincal. vol 9 no. 1 59-701997
[15] Magne P, Douglas WH. Design optimization and evolution of bonded ceramics for the anterior dentition: a finite-element analysis. Quintessence international. 1999 Oct 1;30(10).
[16] Layton D, Walton T. An up to 16-year prospective study of 304 porcelain veneers. International Journal of Prosthodontics. 2007 Jul 1;20(4):389.
[17] Radz GM. Minimum thickness anterior porcelain restorations. Dental Clinics. 2011 Apr 1;55(2):353-70.
[18] Rosenstiel SF, Land MF, Crispin BJ. Dental luting agents: a review of the current literature. Journal of Prosthetic Dentistry. 1998 Sep 1;80(3):280-301.
[19] Conrad HJ, Seong WJ, Pesun IJ. Current ceramic materials and systems with clinical recommendations: a systematic review. Journal of Prosthetic Dentistry. 2007 Nov 1;98(5):389-404.
[20] Donovan TE, Cho GC. Contemporary evaluation of dental cements. Compendium of continuing education in dentistry (Jamesburg, NJ: 1995). 1999 Mar;20(3):197-9.
[21] Jivraj SA, Kim TH, Donovan TE. Selection of Luting Agents, Part. CDA. JOURNAL. 2006 Feb;34(2).
[22] Guess PC, Schultheis S, Bonfante EA, Coelho PG, Ferencz JL, Silva NR. All-ceramic systems: laboratory and clinical performance. Dental Clinics. 2011 Apr 1;55(2):333-52.
[23] Pilathadka S, Vahalová D. Contemporary All-ceramic Materials-Part 1. ACTA MEDICA-HRADEC KRALOVE-. 2007 Apr;50(2):101.