Peg-shaped lateral incisor: Fixed prosthetic approach
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ABSTRACT

Teeth abnormalities are some of the most frequently found problems in dentistry. Particularly in the anterior area, misshapes can occur, and be a main reason for patients to seek for aesthetic solution. The peg-shaped lateral incisor, as one of the most prevalent abnormalities in the maxillary anterior sector, can be restored with a fixed prosthetic solution. Porcelain veneers or full coverage crowns can be indicated for this case. Even though, the size and morphology of the tooth can dictate the choice of the less mutilant solution. The aim of this article is to show a clinical case where a porcelain veneer was indicated to restore a peg-shaped maxillary lateral incisor.

Keywords: pegged incisor, peg-shaped lateral incisor, misshaped teeth, direct veneer, porcelain veneer, porcelain crown, misshaped teeth management
INTRODUCTION

Tooth agenesis is the most common teeth abnormality to be known. Frequently, it’s associated with other genes’ mutations leading to other tooth abnormalities, mainly microdontia. Maxillary lateral incisors are known to have the most morphological variations. According to Grahnen, a peg-shaped tooth is a tooth which has a larger mesiodistal cervical width compared to the incisal width. A retrospective study reports a prevalence of peg-laterals ranging from 0.6% to 9.9% and varying by ethnicity, sex, and region, but the overall prevalence is about 1.8%, which corresponds to one in 55 people worldwide. A meta-analysis about the prevalence of peg-shaped maxillary lateral incisors, yielding 3337 records, in 2013, shows a prevalence of peg-shaped maxillary permanent lateral incisors of 1.8%. Women are 1.35 times more likely than men to have peg-shaped maxillary permanent lateral incisors. The prevalence rates of unilateral (0.8%) and bilateral peg-shaped maxillary permanent lateral incisors are approximately the same. The peg-shaped lateral incisors are nowadays one of the most important concerns of dentistry, since the aesthetic prejudice it can cause.

The evolution of aesthetic conceptions we are witnessing in this new century, added to the big variety of ceramic materials and bonding systems make of the fixed prosthodontics a considerable option for aesthetic rehabilitations, particularly for pegged laterals.

Full ceramic crowns can offer excellent aesthetic results when great mimicry of shade and shape is performed. Although managing the right prosthetic space for an all ceramic crown requires a further reduction of the misshaped tooth. This reduction may compromise the mechanical strength of the incisor and the pulp vitality. Thus, a more conservative solution as veneer may be better considered for these cases. Resin veneers can be a viable and attractive alternative. It offers satisfying aesthetics and easier clinical steps. But, subject to wear and staining, they are still not a number one option. That leads as to porcelain veneers that require a minimal preparation, offering and excellent aesthetic outcome and a considerable longevity.

This article shows a case report where a porcelain veneer was indicated to aesthetically rehabilitate a peg-shaped maxillary permanent lateral incisor.

Case report:

A twenty-two-year-old medical student, that consulted the fixed prosthodontic department asking for a cosmetic treatment for her misshaped lateral incisor, known as "pegged lateral incisor". The first appointment involved a discussion with the patient that led to establish the diagnosis as well as the patient’s preferences regarding the prosthetic treatment to opt for. The clinical examination showed a poor hygiene and an inflammatory gingiva. A periapical radiography was also performed to verify the status of the tooth's root. The radiography showed pulped incisor with no abnormalities.

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The diagnostic cast was waxed to perform the silicone key for the provisional chairside restoration (Fig3). It’s then used to make a new duplicate used for the fabrication of a transparent thermoformed template.

A complete clinical examination revealed an important size of the pegged incisor although its shape. The mesio-distal distance was favourable to indicate a porcelain veneer. It also showed that both the pegged lateral incisor and the contralateral one had the same coronal height. Besides, the palatal position of tooth #22 was noticed, which means that a satisfactory buccal space was available with no preparation. Thus, it was concluded that the crown option is not the best for the case, but the porcelain veneer would be more suitable.

The next step was performing the mock up. To do so, the template was placed over the arch and an A-1 shaded flowable resin composite was injected through a small opening above the tooth (Fig5).

Fig.2: Periapical radiography

Fig.3: waxed casts

Fig.4: The waxed casts

Fig.5: Mock up fabrication with the flow injection technique

Fig.6: The mock up
Tooth preparation should be guided by mock-up (Fig6). Only in this way the preparation can be controlled according to the desired final volume for the ceramic material. To do so, a rounded bur was used to make 3 horizontal facial depth cuts from the mesial to the distal angle (Fig7A). Then, a deep chamfer bur was used to draw the finish line and remove the cuts (Fig7B). The incisal edge was slightly prepared to have it covered with the veneer (Fig8).

**Fig.8: The prepared tooth**

After preparation, the master impression was made with light and heavy silicone type A. At the end of the session, the chair-side temporary prosthesis was fabricated (Fig9).

**Fig.9: Master impression**

The next appointment was for the clinical try-in. The preparation was first cleaned.
Fig. 8: The prepared tooth

Then the veneer was fabricated with glass-ceramic lithium disilicate-reinforced (Fig 10), so it was prepared for bonding by: first etching using a 10% HF acid (Fig 11), then applying a thin layer of silane coupling agent or primer, gently dried with a stream of air (Fig 12).

Fig. 10: The porcelain veneer

Fig. 11: Etching of the veneer

Fig. 12: Applying the silane on the veneer

After that the tooth was treated. A rubber dam was first placed for isolation. Then the prepared tooth was thoroughly rinsed (Fig 13). After that, the tooth surface was etched with a 35% phosphoric acid for 15-30 seconds. The tooth is finally rinsed and dried (Fig 14).

Fig. 13: Rubber dam isolation
weeks following the treatment. During this appointment we can repolish the veneer surface, and check the gingiva status. In this case we could see the gingival edge around restored tooth #22 filling the gap between teeth #21 and #22 and taking the right crescent shape in harmony with the rest of anterior gingival contours (Fig18B).

Discussion:

To restore a peg shaped tooth, many therapeutic approaches can be considered. Crowns can be described as an efficient option to correct peg-shaped teeth. Full porcelain crowns can perfectly boast the aesthetic result and maintain it for years. But to indicate a full crown on a peg lateral, requires a full preparation. This means that approximatively 65% of the tooth will be removed. A favourable cervical large chamfer should be managed. Removing enough labial tissue to avoid over contours and removing undercuts will leave a barely covered pulp, since peg laterals have already thin layers of enamel and dentine surrounding the pulp8. Therefore the indication of a full porcelain crown on a pegged lateral should be well considered. Obviously the purpose of this treatment is an aesthetic restoration of a misshape, but the mechanical considerations as well as biological ones should not be ignored.
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Many opinions prefer the direct composite restorations as a faster and safer treatment option for pegged laterals. Many studies were conducted to evaluate the longevity of these restorations. Walls et al conducted a two-years clinical trial of a composite laminate veneer system for masking discoloration or hypoplasia on the anterior teeth. The technique produced an acceptable improvement in the aesthetics of the patients in the trial. However, the composite veneers were susceptible to chipping (52% of lateral incisor) and marginal staining: 75% of veneers showed some evidence of marginal staining after two years during function. The veneer restorations had a deleterious effect upon the gingival health of the teeth on which they were placed.

Therefore, porcelain veneers seem to be a better solution allowing to avoid all the disadvantages of composite veneers. Many studies showed that veneers have a good survival rate. According to Pjetursson et al. porcelain veneers show a survival rate comparable to that of metal ceramic restorations. A Friedman study in 1998 shows that the porcelain veneer is the most conservative restoration among the longest lasting.

Misshaped teeth is one of the main indications of porcelain veneers. A minimally invasive preparation was required since the palatal position of the pegged tooth in this case and its large mesio-distal diameter. The preparation was finished on enamel to optimize bonding. We didn't need to manage a great space since the shape and position of the lateral incisor, therefore the porcelain veneer seemed like the most suitable prosthetic option.

The indication of the porcelain veneer to treat this case is basically founded on the important size of the tooth. Contrary to small tapered peg-shaped incisors, this pegged lateral offers a wide foundation for the veneer. Thus the veneer is well reinforced with no risk of cantilevered ceramic.

In the present case, the try in was checked by both practitioner and the patient. She was satisfied by the shape and proportions of the veneer. However a black gap was observed in the mesial space between teeth.

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#22 and #21. Therefore a periapical radiography was carried out. Then the distance between the contact zone and the bone edge was measured. The measurement did not exceed 5 mm (Fig17) which means that the gingival papilla in this area would proliferate and fill the gap. This was actually checked in the next follow up session.

Fig.17: Measurement of the distance between the contact zone and the bone edge on a periapical x-ray

Fig.17: The patient’s smile

Fig.18: A- The black gap observed at the try in
B- The papilla regeneration observed at the follow up session

The ultimate success of esthetic treatments is only achieved when the patient is educated and motivated to maintain good oral health. The patient contribution and periodic control by the dentist is imperative to the long-term success of the treatment.
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Conclusion:

Many options can be available to treat peg-shaped lateral incisors. We can not choose one option over another without a good case study. Every option: direct veneer, porcelain veneer or a full crown, has its indications and advantages that may make it more suitable for a particular clinical case. Aside clinical data, other parameters can also be considered, as patient's requests and availability6. There is no perfect solution to opt for every time a pegged tooth is to correct. But there are solutions to consider and to fit them to the clinical case.

References:


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