Guest author
Mark Knapp

Managing the PEG LATERAL INCISOR

The peg shaped upper lateral incisor presents relatively commonly, affecting a little over 1% of the population. In more than half the cases the condition is bilateral. The tooth or teeth are usually healthy and functional – the *microdontia* relating predominantly to a malformation of the crown, while the root structure usually remains sound and only slightly reduced in size. The teeth have a healthy long-term prognosis.

If there is a problem, it is a perceived aesthetic one.

Many patients are completely unconcerned about the look of an unusually narrow front tooth, for others it is a major embarrassment. Often they are reluctant to enquire about treatment options as they suspect there are either none or fear the choices involved will be expensive and complicated.

It is part of the dentist's role to discretely ascertain whether there is interest in changing the appearance of the lateral and then to describe and advise on the different approaches available.

TREATMENT OPTIONS

The aim of treatment should be to give the lateral a normal looking crown structure that appears unremarkable. Usually, sufficient space exists between the central and canine to allow restoration. Occasionally, the canine will have drifted mesially, close to the lateral's distal wall and orthodontics will be needed to create room.

Restoration can be indirect or direct. As is so often the case, neither approach is definitive and each brings distinct advantages and disadvantages. Proponents will often gravitate to one

technique or the other through familiarity. Habit and repetition do build proficiency but it is nevertheless worthwhile considering alternative approaches and what they can offer.

PORCELAIN CROWNS

When shade selection is good, full porcelain crowns can regularly boast outstanding aesthetics. Apart from the risk of gingival recession revealing margins and an acidic diet degrading surface lustre, a natural appearance can be maintained for years. While they are not subject to wear, staining or other slow deterioration, their greatest liability is fracture, particularly in the incisal half when the porcelain is thin.

The most obvious way to increase bulk when crowning any tooth is with a commensurate reduction in enamel and dentine and, on average, crown preparation removes approximately 65% of coronal tooth structure. In this case it is the tooth preparation which is the major cause for concern.

Peg laterals already have minimal enamel and dentine surrounding the pulp. They are narrow and often tapering but they do display subtle bulges and convexities which would demand reduction. Cutting the recommended chamfer at the cervical, removing undercuts, as well as enough labial tooth substance to avoid an overcontour of the crown leaves little covering the pulp.

Likewise, the mechanical strength of an already compromised tooth is further reduced.

PORCELAIN VENEERS

Porcelain veneers are more conservative but margins still have to be prepared to provide definitive seating and to avoid vulnerable feather edges of thin porcelain. The cervical margin invariably requires chamfering and, unless the tooth is effectively being repositioned forward, there must be some preparation of the labial surface extending to the incisal edge. When the lateral abuts against the central, its mesial wall will likewise require shaping.

On normally shaped incisors, veneers have a good ten year survival rate despite the fact that, like any ceramic, they are inflexible and brittle. If bent 0.1% they will fracture. Generally, veneers succeed and resist flexing through the strength imparted by bonding to a substantial surface of enamel.

The problem when placing a veneer on a peg lateral is that the restoration can be almost twice as wide as the tooth supporting it. If the tooth tapers, it can be three times wider across the incisal. Therefore, a large part of the porcelain will lack the strength acquired from a sturdy foundation. Effectively, it is cantilevered without a base of reinforcement.

COMPOSITE FACINGS

While these issues may be cause for concern, patients often simply have an emotional aversion to 'drilling healthy front teeth'. They are acutely aware that preparing any tooth for an indirect restoration is irreversible. They should also realise that crowns and veneers do occasionally chip and, when this happens, they can not be reliably repaired. The only way to manage fractured porcelain is to replace it completely.

The other, most obvious consideration is financial – an indirect ceramic restoration costs three or four times that of a direct restoration.

A composite resin facing can be a viable, attractive alternative. It requires no preparation, can be readily modified for shape or shade, can just as easily be repaired and only requires one appointment.

In theory it should be possible to treat a peg shaped lateral with mesio-incisal and disto-incisal restorations. In practice the margin

Fig 1. Both lateral incisors were peg shaped. The upper left canine was palatally placed while the deciduous canine was retained.

of composite to enamel is usually its point of weakness and can be subject to staining. Complete coverage of the labial surface is a more practical solution, particularly as the veneer of material can be extremely thin.

CLINICAL EXAMPLE

The patient was a 28-year-old woman concerned about bilateral peg shaped lateral incisors. The upper left canine was palatally placed but not visible in a social context. The deciduous canine was retained but stable and had a passing resemblance to the permanent tooth (Fig1). The patient was not interested in moving the 23 into position either orthodontically or surgically.

Following discussion it was decided to leave the left-hand canines as they were and build up the laterals with composite facings to the dimensions of more normal teeth. This included some lengthening at the incisal edges. The two teeth were to be done separately over consecutive visits.

The first step in any reconstruction is to determine shade and opacity using mock-ups of composite resin. This is a trial and error procedure where various materials are positioned and spot cured. Microfil composite has good handling properties and an excellent lustre but is very translucent. The surrounding teeth were rather opaque and it was decided to instead use predominantly nano hybrids with opacity in the mid range ('*Body*', between *Incisal* and *Dentine*.)

The 22 was cleaned with a rubber cup and pumice and a blunt fluted bur around the cervical. Enamel was etched and washed and adhesive applied and cured.

Fig 2. Wings of composite resin were created on the mesial and distal walls to support plastic matrices and encourage a taper of the proximal walls.

ANGLING THE APPROXIMAL WALLS

One dilemma when any type of anterior proximal restoration extends to the incisal edge is that a plastic matrix strip must be pulled forcibly against the tooth. This is needed to achieve intimate contact of the material with the enamel and to avoid overhangs at the gingival margin, but it can also undercontour the tooth and preclude any contact with its neighbour. To overcome this, flowable composite was extruded from each of the approximal surfaces, close to the incisal, across towards the adjacent teeth and cured incrementally. These wings would later be used to support the matrix strips and angle them diagonally (Fig 2).

INCREMENTAL BUILD-UP

A natural tooth not only displays gradations of shade but also depth, particularly in young people where the enamel is translucent. Artists achieve subtlety and a sense of three dimensions by painting in increments, with undercoats effectively casting shadows through subsequent surface layers. In this case, a similar approach was to be used with the tooth built up in stages.

A small, thin amount of A2 was placed and cured on the labial in the cervical third. A1 was applied to the mid portion and, before curing, tiny indentations created with the tip of a probe. Small flecks of opaque white tint were then added to the hollows and onto the incisal enamel to mimic the fluorosis spots seen on the neighbouring teeth.

To aid the flow of the next layer and prevent voids, this initial build up was smeared with a small amount of resin adhesive, blown with air and left uncured. Using plastic matrices angled into the cervical margins, B1 was then placed mesially and distally and manipulated onto the labial, over the earlier material, and onto the incisal (Fig 3).

Fig 3. The overlaying of different shades of composite resin was designed to give the tooth an appearance of depth and realism.

Fig 4. The 12 was to be restored at the following appointment.

Fig 5. The completed 12 restoration.

Fig 6. The completed case.

It is difficult to ensure viscous composite always extends fully into crevices between teeth but, if the plastic strip is pulled palatally as the material is applied, friction will drag it interproximally.

Invariably some irregularities are found on the palatal margins. These were corrected with flowable composite, cured under a wash of glycerine to prevent any air inhibited layer.

The build up was then shaped with disks, FG diamond burs and abrasive strips. Football shaped tungsten carbide burs were used to create undulations and scatter light. Long straight multi-fluted burs and rubber cones were then used to polish the surface (Figs 4-6).

The importance of good plaque control around the margins was emphasised, together with the need for regular review and maintenance.

CONCLUSION

A direct composite facing can be a successful alternative to more invasive, expensive procedures when restoring an unusually shaped incisor. It can be completed in one visit and can easily be modified or repaired.

This type of aesthetic dentistry represents one of the few occasions when patients 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.

DISCLAIMER

The statements in the above article are published on the authority of the author and have not been peer-reviewed. They do not necessarily reflect the views of the ADA and publishing them is not to be regarded as an endorsement of them by the ADA.