Enhanced CPD DO C

Tom Bereznicki

Top Tip

The creation of an emergence profile to improve the aesthetics of a conventional bridge in a high lip line case

CPD/Clinical Relevance: An ovate pontic form is designed to emerge out of the gum in the same way that teeth do, and its use can provide a more natural and aesthetic appearance when replacing teeth in the aesthetic zone.
Aesthet Update 2025; 2: 158–164

These days, patients' expectation of any form or type of dentistry is that it should be aesthetic. It is not only those patients with a high lip line that have these expectations, many patients with low lip lines also seem to judge their aesthetic result by what the restorations look like when they lift their lip up, even though no one else ever sees that view (Figure 1).

Traditionally most bridgework used a ridge lap design for the pontic, which invariably resulted in poor aesthetics. The pontic tooth/teeth always looked as if they were sitting on the gum rather than emerging from it and Figure 2 shows a selection of such pontic designs, which are clearly not aesthetic.

In Figure 3, pictures taken before and after treatment to replace an existing partial denture demonstrate how gingival tissues can be moulded using an ovate pontic design to give a natural appearance. The pontic teeth appear to emerge from the gums rather than merely sitting on them.

Even when providing full dentures, the positioning of the acrylic gingivae is crucial

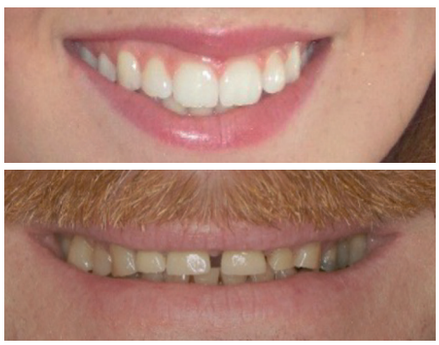

Figure 1. (a) High and **(b)** low lip line smile.

for aesthetics. Ideally the papillae, but not the zeniths, should be seen at rest. Figure 4 shows a good example of poor aesthetics with the existing crowns and the excellent aesthetics that were achieved following the provision an immediate denture.

Pontic design

The traditional sanitary, conical and ridge lap pontics no longer have a place in today's dentistry in the aesthetic zone. This leaves two alternatives: the modified ridge lap, or ovate pontic designs. Whichever of the two pontic styles is chosen, allowing the ability to clean under the

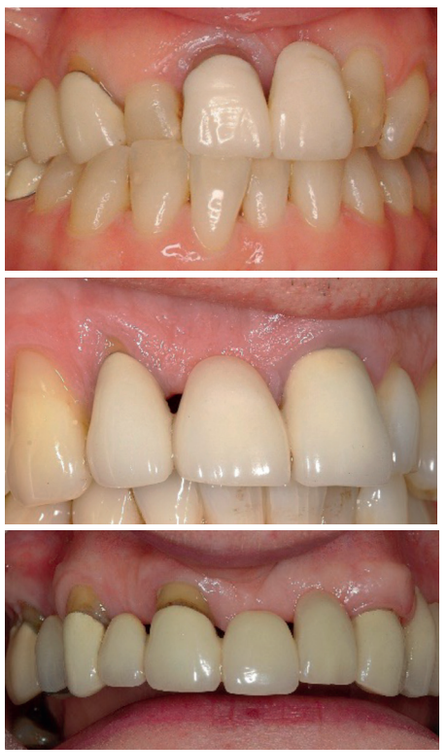

Figure 2. (a) UL1 pontic. **(b)** UR1 pontic. **(c)** Ridge lap pontics UR2 and UL2.

Tom Bereznicki, BDS (Edin), MFDTEd MFGDPEng, MCGDent Visiting Clinical Specialist Teacher, Department of Primary Dental Care, King's College London; Private Practice, Dawood & Tanner, London.
email: tombereznicki@gmail.com

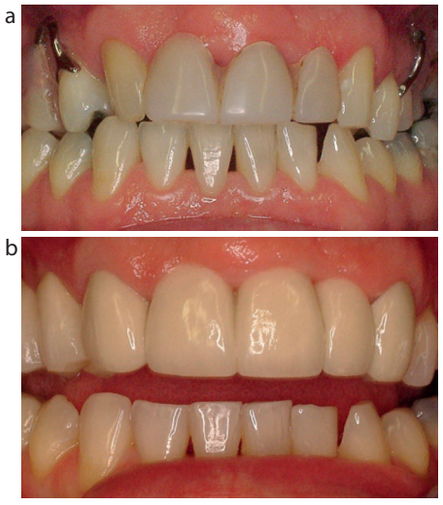

Figure 3. (a) Facial view of a patient with a cobalt–chrome denture replacing three anterior teeth. **(b)** Facial view on fit of a fixed bridge with ovate pontic design.

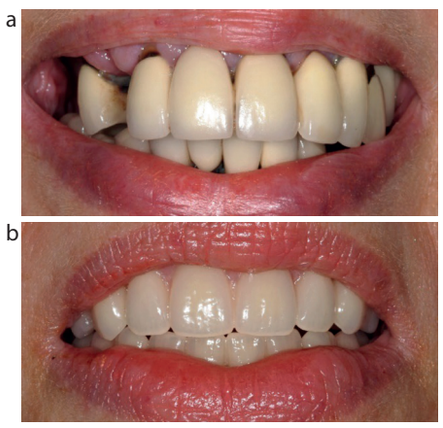

Figure 4. (a) Facial view prior to treatment. **(b)** Facial view 10 days following a full upper clearance and provision of full upper and lower immediate dentures.

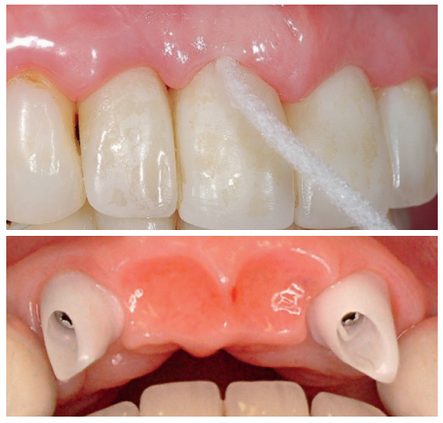

Figure 5. (a) The use of Super Floss (Oral B) beneath a provisional bridge. **(b)** Healthy tissue in the pontic area on removal of an implant cemented retained bridge.

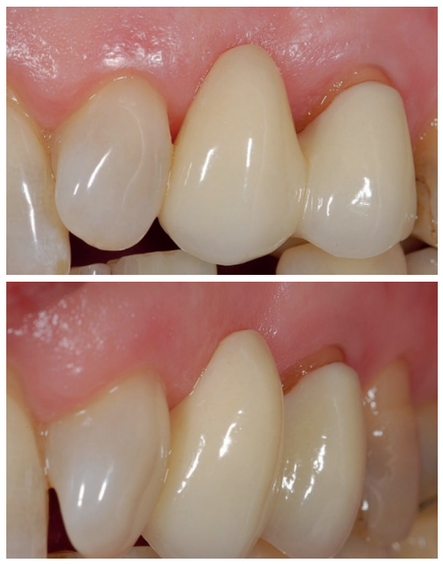

Figure 6. (a) Buccal view of the canine pontic is unaesthetic as it sits on the gum. **(b)** The facial view is even less flattering and unnatural.

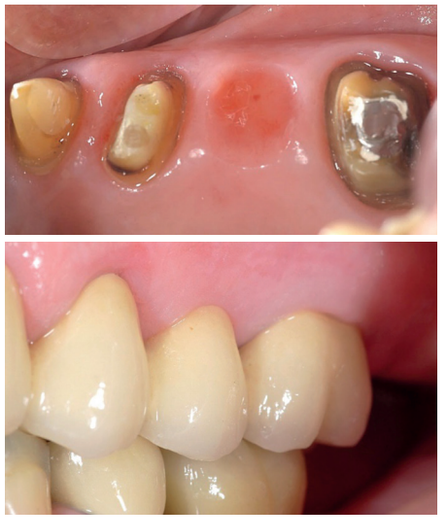

Figure 7. (a) An ovate pontic form created with a provisional bridge. **(b)** Excellent aesthetics associated with the ovate pontic form of the UL5.

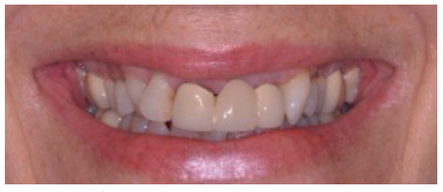

Figure 8. The patient on presentation.

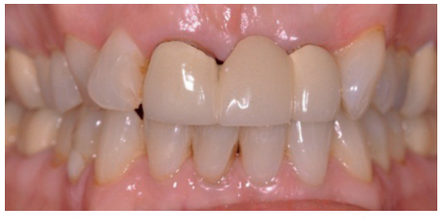

Figure 9. Pre-treatment intra-oral view of the failing bridge.

pontic is imperative to maintain healthy gingival tissues. Although it may seem counterintuitive, the ovate pontic design allows easy access to use floss and ensure ongoing gingival health (Figure 5).

The main difference between the two pontic forms is that with the ridge lap design the pontic sits on the gum, whereas the ovate pontic is designed to emerge out of the gum, in the same way that teeth do.

A good example of ridge lap design is shown in Figure 6. The bridge has been well made, but from whichever angle the pontic is viewed, it always looks false and very often, where underlying bone has been lost, as in this case, too long. Figure 7 shows a bridge in a similar position, but the tissues have been 'shaped' with the temporary bridge to create ovate pontic form, allowing the technician to shape the porcelain pontic of the final restoration to look as if it is emerging from the gingival tissues. On fit of the permanent bridge, the pontic appears to emerge from the gum giving a natural appearance that is almost better than that of the adjacent abutment teeth.

This article demonstrates one technique that can be used to predictably create an ovate pontic design.

Case presentation

The patient, having completed a course of routine dental treatment, complained of the poor aesthetics associated with her anterior bridge and requested an opinion on the various options available to her to replace the failing bridgework (Figure 8). Improved aesthetics were her priority. The various options available were discussed, namely replacing the crowns and the provision of an acrylic or metal-based denture to replace the missing tooth; a new replacement three-unit bridge; or the replacement of the missing tooth with an implant-supported crown and re-crowning the abutment teeth.

The clinical picture shown in Figure 9 clearly demonstrates the failing bridge where ovate pontic form was not considered in the provision of the final bridge, which in turn, combined with the poor colour of the porcelain, resulted in poor aesthetics. The poorly fitting gingival margins are visible on the abutment

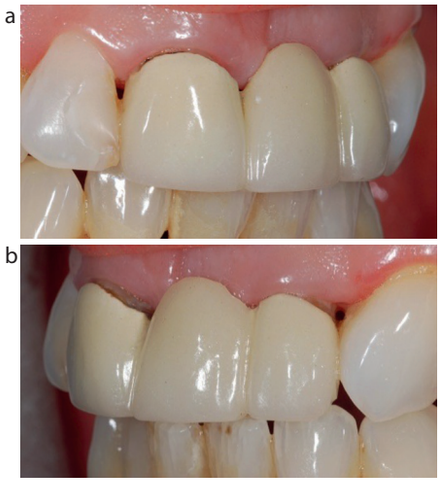

Figure 10. (a) Right and **(b)** left lateral views of the bridge.

teeth, the lack of papilla has resulted a 'black triangle' between both central incisors, the pontic tooth zenith does not match the height of the contra-lateral central incisor and the overall impression is of artificial teeth. There is also a failing discoloured composite on the mesial surface of the right lateral incisor.

The close-up lateral views in Figure 10 show just how poor the aesthetics are when viewed from different angles. The 'ridge-lap' design pontic is 'sitting' on the underlying gum rather than appearing to emerge from within the surrounding gingivae, giving an artificial appearance to the replacement tooth. Porcelain contouring is poor giving a lumpy appearance between the pontic and the lateral incisor.

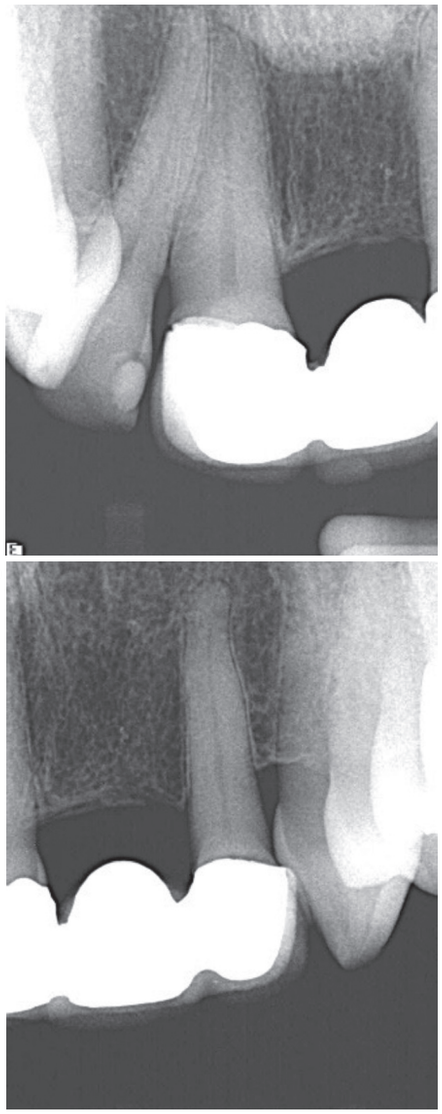

Figure 11. (a,b) Radiographic appearance of the bridge and abutment teeth.

Treatment planning

Impressions for study models were taken, along with facebow records and appropriate radiographs. The models were mounted on a semi-adjustable articulator and the case analysed. Having considered the various options presented and being satisfied with the function of the existing bridge, the patient opted for the provision of a conventional replacement bridge. Radiographically, there were adequate bone levels and healthy abutment teeth with no peri-apical pathology (Figure 11). Vitality testing showed both abutment teeth were vital. There were no clinical or medical issues to contraindicate the proposed treatment. Although the design of the current bridge was unusual in that it used a lateral incisor as an abutment, the bridge itself exhibited no excessive mobility, most likely because of the long and rather wide lateral incisor root form. The authors were confident that a similar design would provide a predictable and long-lasting restoration.

The aesthetic issue of the pontic design was discussed with the patient and agreement reached to allow a minor surgical procedure to be undertaken to provide the initial emergence profile. The patient understood that the emergence profile would be created and developed using a provisional bridge which, in turn, would be used for up to 3 months to refine the tissues and allow maturation of the gingivae following the procedure. This bridge would ultimately be replaced with the definitive bridge fabricated with a metal-free design.

It was also pointed out to the patient that there was residual fibrous tissue in the buccal mucosa remaining from an old, healed discharging sinus (probably associated with the extracted UL1), as well as a fleshy prominent fraenum and its removal was recommended to enhance final aesthetics. This procedure was to be undertaken at the same time as the ovate pontic form was to be created. The patient declined this option on the grounds she wanted to keep the procedure as simple as possible.

Some of the acknowledged requirements/recommendations related to ovate pontic procedures to create an emergence profile are:

- The pontic requires attached gingivae, not mucosa.
- Use of pressure with a provisional restoration for creation. This technique when used with conventional bridgework proves to be difficult as the pressure required to create the profile can lead to frequent de-cementation of the bridge. Several visits are required and if stronger cement is used between visits to avoid bridge loosening, there is always the risk of its fracture on removal. This technique is better suited to screw-retained implant-supported short-span bridgework.
- The use of electro-surgery to create the emergence profile. The drawback with this technique relates to the loss of gingival tissue, which once removed will not return. As much soft tissue as possible should be retained and used to recreate the papillae. If there is too much tissue it can always be trimmed away at a later stage
- The surgical approach. This involves the creation of an ovate pontic form in a temporary bridge, lifting a flap in the edentulous ridge area, 'dropping' the pontic into the subgingival space created and allowing the tissues to heal around it.

Regardless of the technique used, there are further considerations related to ovate pontic form:

- As a rule of thumb, the pontic should not be placed deeper than 1.5mm subgingivally to allow ease of cleaning.
- In the same way that conventional crown preparations should not invade the biologic width, an ovate

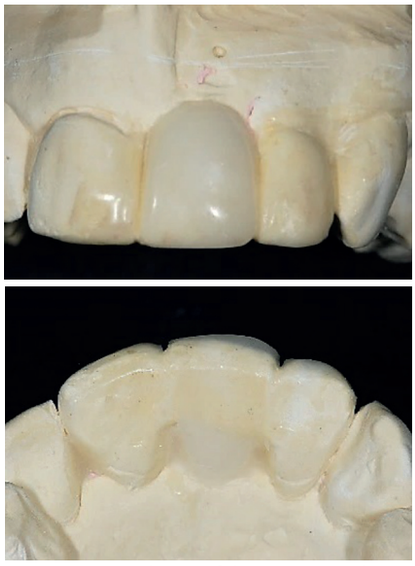

Figure 12. (a) Facial view of the recontoured existing bridge. **(b)** Palatal view of the thickened existing bridge.

Figure 13. Suck down stent.

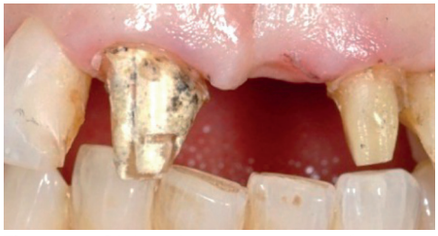

Figure 14. Clinical picture on removal of the bridge.

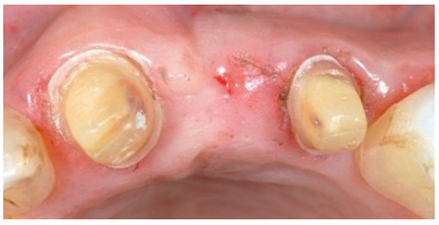

Figure 15. The available ridge.

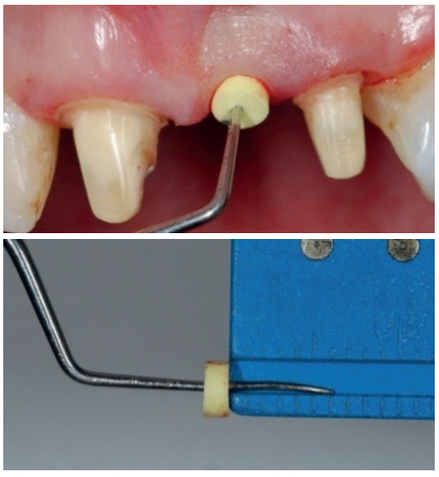

Figure 16. (a) Bone sounding. **(b)** Measurement of the available gingival thickness.

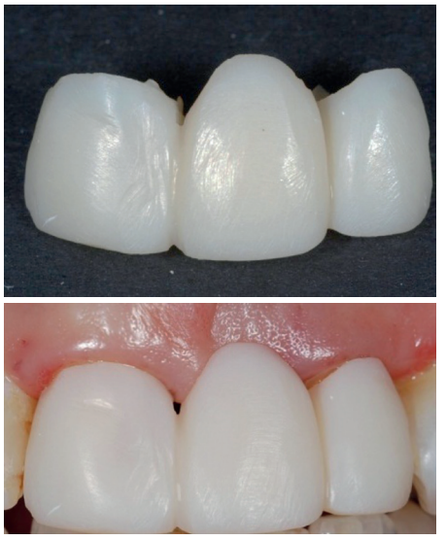

Figure 17. (a) The temporary bridge after trimming and polishing. **(b)** Trial fitting of the bridge.

pontic form requires its own biologic width to avoid chronic inflammation beneath the pontic. To ensure gingival health, there should be 2.5–3 mm of gingival tissue between the porcelain pontic surface and the underlying bone.Even if sufficient space exists between the pontic and the gingival tissue to allow cleaning with floss, chronic inflammation will always be present if this biologic width is invaded.

In the case presented, it is clear from the radiographs that there is sufficient soft tissue thickness available between the gingiva and the underlying bone indicating that it would be unlikely for osseous re-contouring to be necessary as part of the surgical procedure. It is important to realize that this tissue thickness should be confirmed at the time of ridge preparation and the technique adapted to include osseous re-contouring if necessary.

Clinical procedure

Alginate impressions were taken and poured to give working models. As the technique to be used in this case would require the chairside fabrication of a temporary bridge, a diagnostic wax-up was carried out on the upper model to re-define the bridge contours and thicken the palatal aspects of the existing pontic to allow the provision of an ovate design at the time of the surgical procedure (Figure 12). The authors' preference in cases such as this is for the chairside temporary bridge to be constructed using a rigid suck-down stent (Proforma) (Figure 13).

On the day of the procedure, local anaesthesia was administered and the existing bridge sectioned and removed. Figure 14 shows the clinical picture, particularly the low fleshy frenal attachment that the patient had declined to remove and would be likely to slightly compromise the final aesthetic result.

Figure 15 shows the edentulous ridge following sectioning and removal of the existing bridge, minimal re-shaping and caries removal from the abutment teeth. There was some residual subgingival calculus on the mesial surface of the lateral incisor that was scaled away. The ridge showed, as expected, adequate width mesio-distally and bucco-lingually, ample attached gingivae and the authors' opinion was that no further adaptation was required

As mentioned previously, although there appeared to be an adequate thickness of gingival tissue in the edentulous area, it was decided to carry out bone sounding to confirm the radiographic evaluation. The authors prefer the use of a slightly blunt probe for the procedure to avoid accidental penetration of the underlying bone, which would distort the true thickness measured. Figure 16 shows the clinical bone sounding and depth measurement with a rubber stop. The available gingival thickness measured 6 mm confirming the radiological picture

The preformed stent to be used to fabricate the temporary bridge was painted both inside and out with a separator, filled with a temporary crown and bridge material (Protemp, Shade A2, 3M ESPE), and fitted in the mouth until fully set. The bridge is shown after trimming and polishing and trial fitting in

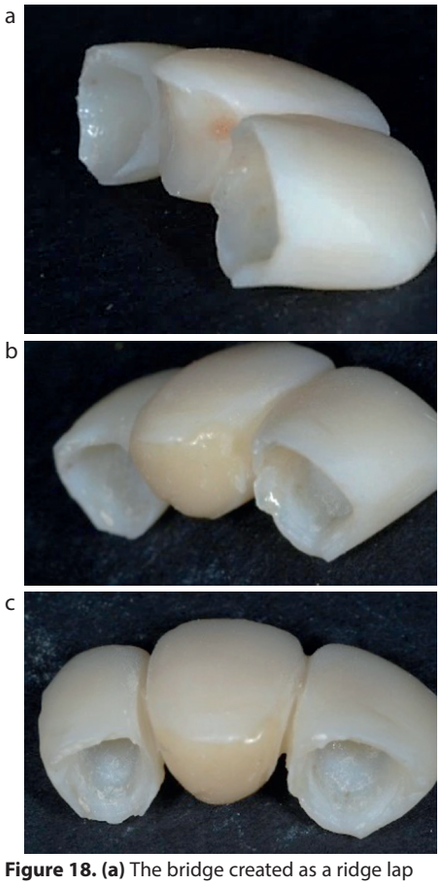

Figure 18. (a) The bridge created as a ridge lap design. **(b)** The bridge converted to ovate pontic design. **(c)** The polished bridge.

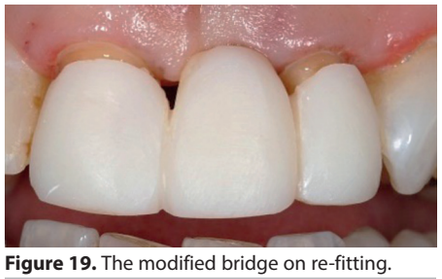

Figure 19. The modified bridge on re-fitting.

the mouth (Figure 17). It is clear that the bridge is an improved copy of the original in that it still shows open embrasures and a ridge-lap pontic design.

The next step was to convert the ridge lap pontic (Figure 18) to an ovate design. This was achieved by air abrading the underside of the ovate pontic, applying composite activator, air drying and after 20 seconds applying All Bond (Bisco) and light curing for 20 seconds. Venus Shade A3 (Heraeus Kulzer) composite was moulded to reshape the prepared area into an ovate pontic and as well as increasing the height of the pontic by 3 mm (the 6 mm of gingival thickness

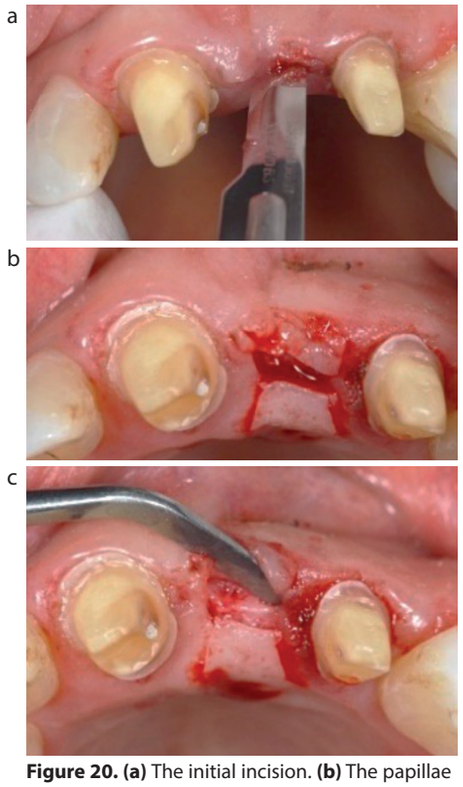

Figure 20. (a) The initial incision. **(b)** The papillae must remain untouched. **(c)** Reflecting/pouching of the buccal and palatal tissues.

present minus the desired 3 mm necessary to maintain the biologic width discussed previously). Once the correct form was achieved it was light cured for 40 seconds. The surface was then trimmed with discs (Soflex, 3M ESPE) and polished with rubber wheels (Shofu) and impregnated brushes (Occlubrush, Kerr). The darker shade is used to allow differentiation between the original bridge and the new additions.

On refitting the converted bridge in the mouth, the bulk of composite added during the conversion to an ovate pontic does not allow full seating (Figure 19). The gap between the restoration margin and the margins of the preparations should not measure more than the desired 3 mm. If the gap measure is greater, then the fit surface of the pontic has to be reduced until the correct dimensions are achieved.

With the bridge correctly prepared, the minor surgical procedure was undertaken after infiltration with local anaesthetic (Figure 20). The authors prefer to make the incision to the bony crest, using a No 15 scalpel blade, and for it to be placed palatally (discussed

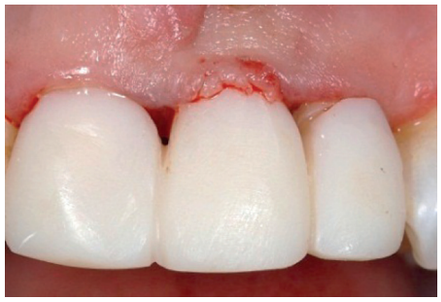

Figure 21. The temporary bridge fully seated.

later) to the midline of the ridge with relieving incisions both mesially and distally, avoiding the existing the papillae. If this advice is ignored, there is a high chance of a loss of one or both papillae, and the possible appearance of 'black' triangles interproximally. Minimal buccal and palatal flaps are then raised by gentle pressure with a thin periosteal elevator.

If the flaps are simultaneously reflected, a 'hole' should exist for the pontic to fit into (it is important to ensure that there is no trapped tissue under the pontic on trial fit). If the ovate pontic is correctly designed, a perfect fit of the bridge should be achieved. At this point, the distance between the pontic and the underlying bone should be checked from the palatal aspect to ensure that the desired 3 mm space is present. If the gap present is less than 3 mm, the bridge should be removed and adjusted accordingly until the correct space is created (Figure 21).

In order to maximize the height of the buccal tissue on healing, it is now clear why the relieving incision was palatally placed. If the incision is buccally placed, the pontic would not be covered by gingival tissue as it is as shown in Figure 21.

To maintain the excellent aesthetics of the bridge, it was cemented with TempBond Clear (Kerr) rather than the whiter normal temporary cements, such as original TempBond (Kerr), which tend to show through the thinner sections of the temporary bridge. Other useful properties of the clear material are easy removal of the bridge at follow-up appointments and its easy removal from the fit surface of the bridge and the abutment teeth.

The use of a periodontal pack is completely unnecessary and in fact, contraindicated, so as not to compress or displace the buccal tissue from its

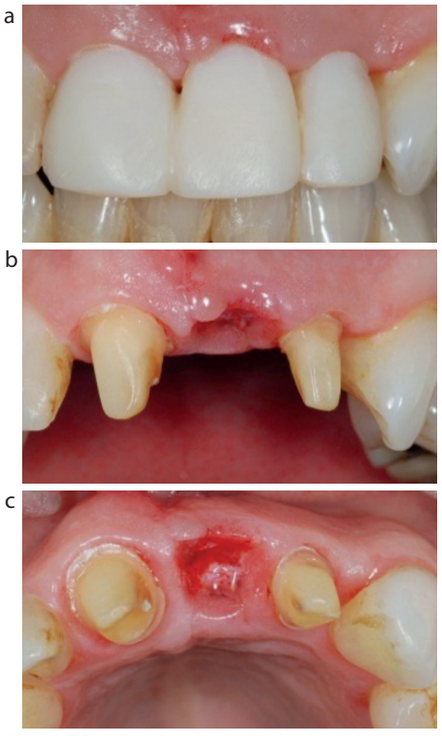

Figure 22. (a–c) The tissues at the 1-week review.

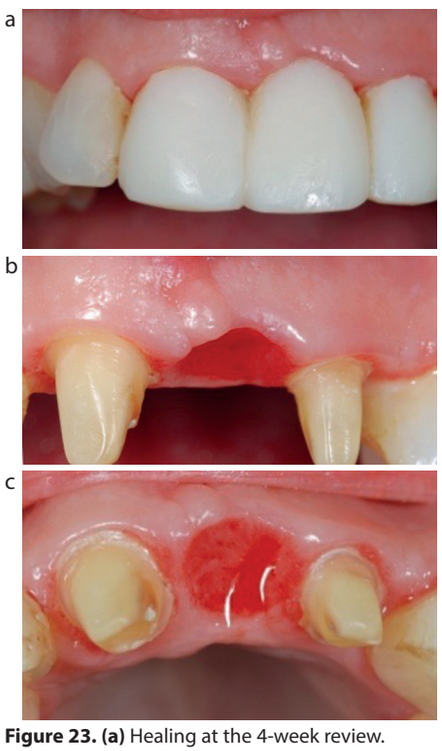

Figure 23. (a) Healing at the 4-week review. **(b)** Buccal view on removal of the bridge. **(c)** Occlusal view.

ideal position. The patient was instructed to avoid brushing the surgical site and to rinse twice daily with a mouthwash, such as Corsodyl (GSK), until the review appointment 1 week later.

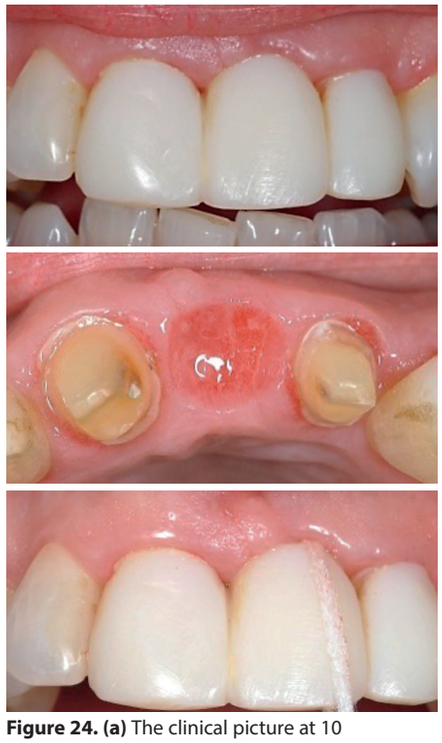

Figure 24. (a) The clinical picture at 10 weeks: the gingival zenith is a little too high compared to the adjacent central incisor. **(b)** The maturing gingival tissues beneath the pontic. **(c)** Demonstrating the correct use of Super Floss.

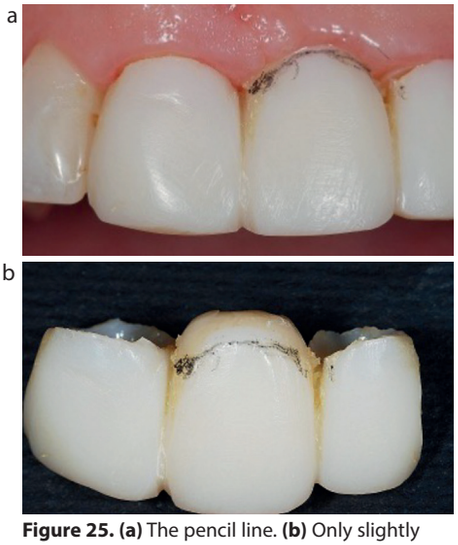

Figure 25. (a) The pencil line. **(b)** Only slightly adjust above the pencil line.

On review the following week, the patient reported only mild post-operative discomfort and no swelling from the day after the procedure. On removal of the bridge, the rapid healing in the pontic area was self-evident (Figure 22).

At this point, as the embrasures were still slightly wide open showing black 'triangles' both mesially and distally,

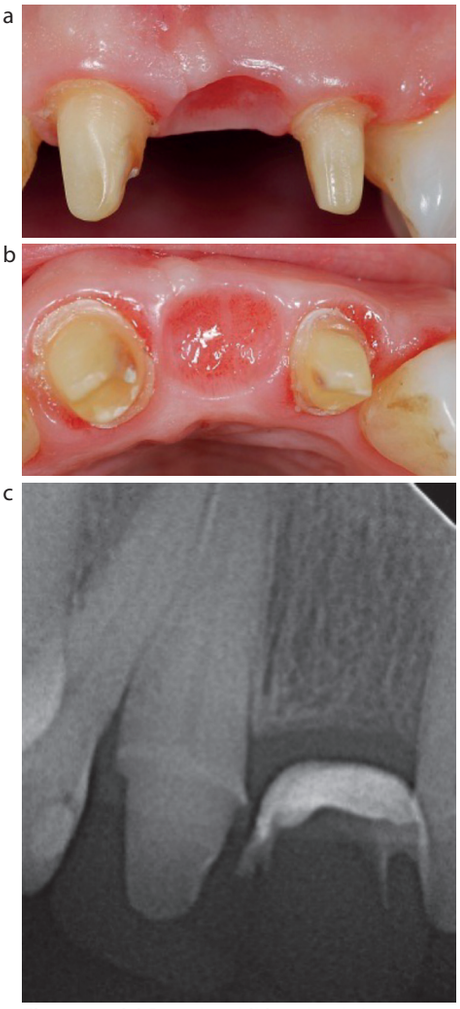

Figure 26. (a) Buccal and **(b)** occlusal views at 13 weeks. **(c)** Radiograph showing the 3-mm space between the pontic and underlying bone required for biological health.

the design and shape of the pontic was slightly altered with the further addition of composite mesially and distally at subgingival level in order to apply pressure in the interdental area. This pressure compresses the papillae and stimulates them to fill the available interdental space between the bridge and the pontic. The use of Corsodyl mouthwash was extended for a further week.

At the 1-month recall, the clinical picture along with the elimination of the black 'triangles' was self-evident (Figure 23). The gingival tissues in the pontic area still lacked maturity, but the shape of the emergence profile was beginning to develop (Figure 23b).

Excessive addition of composite at the distal area of the pontic at

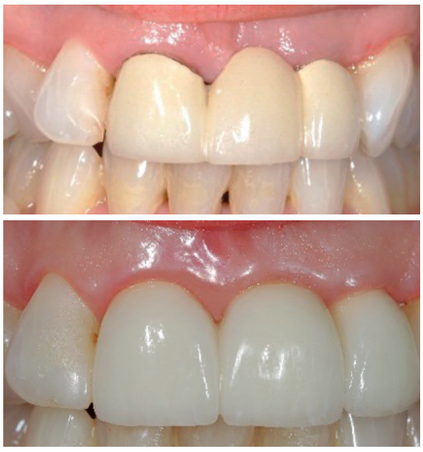

Figure 27. (a) Buccal view of the original bridge. **(b)** Buccal view of the new bridge just after the fit.

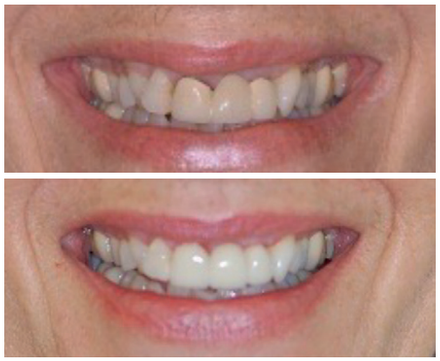

Figure 28. Facial views of the patient **(a)** prior to and **(b)** after completion of treatment.

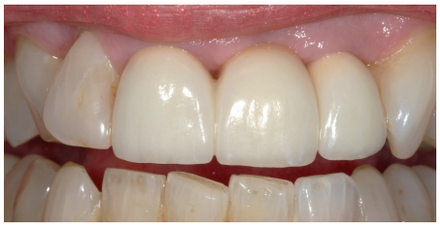

Figure 29. At the 8-year review.

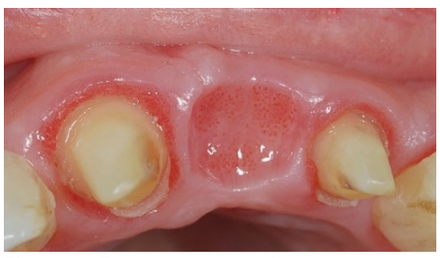

Figure 30. The emergence profile created is maintained only by the provisional bridge.

the previous appointment had over-compressed the papilla adjacent to the lateral incisor and so this area was marginally re-shaped to allow greater space for papillary re-contouring. Mesially, some composite was added to further compress the papilla to reduce its width and increase papillary height (Figure 23c).

At the 10-week review, the papillae had started to infill the embrasures created and had better contours (Figure 24). The gingiva in the pontic area had also matured further. To encourage further tissue maturation in the pontic area, the patient was shown the use of Super Floss (Oral B). The ovate pontic design allows easy passage of the Super Floss between the pontic and the underlying gingivae (Figure 24c). The patient was encouraged to try to keep some finger pressure on the incisal tip of the bridge to avoid accidental dislodgement.

At this recall appointment it was also considered that the gingival zenith above the pontic was too high in comparison the adjacent central incisor. In the same way that the shape and height of the papillae can be influenced by adding or reducing the width of composite in the interdental area, so too can the height of the gingivae buccally. If the height of the gingiva is to be raised, composite should be added buccally and if lowered, then the thickness should be reduced, and in either case only at subgingival level. A useful tip to know where to adjust the pontic as required, is by drawing a pencil line at the gingival margin with the bridge in place (Figure 25). Additions or reductions should only take place above this line. In this case, the buccal thickness that was situated under the gingival tissue was reduced and polished. As the existing interdental contours had an excellent shape, care was taken not to alter the shape of the pontic in that area.

At the 13-week recall, the tissues showed excellent maturity (Figure 26). The inability to completely eliminate some superficial inflammation in the pontic area (Figure 26b) was related to the difficulty of leaving the fit surface of the pontic area completely porosity free. A check radiograph can be taken to confirm that adequate space exists between the pontic and the underlying bone and that the biologic width has not been encroached upon before proceeding to the final bridge (Figure 26c). It was felt that the emergence profile could not be improved further, so appointments were made for the final impressions to be taken.

Figure 27 shows the close-up buccal view of the old and new bridge, as well as the replacement of the old composite filling mesio-incisally on UR2. Figure 28 shows the patient's smile before and after treatment – the difference is obvious.

Conclusion

The technique shown is not only fiddly, but also time consuming. It is certainly not warranted in the majority of aesthetic dentistry carried out everyday in practice. However, as a proposed technique that is predictable, it is an option to consider for demanding high lip line patients.

Figure 29 shows the stable result achieved at 8-year review is excellent with one exception – namely the flattened papilla between both central incisors. On completion of treatment, the patient returned to her regular dentist and the hygienist at the practice recommended the use of TePes for interdental oral hygiene, in turn creating papillary flattening. It should be stressed to patients that to maintain the profile, only the use of Super Floss is recommended

One final observation is that the emergence profile created (Figure 30) is only maintained by the provisional bridge. As soon as it is removed, the profile starts to relapse. Another Top Tip will present the suggested impression technique to exactly duplicate the emergence profile on a working model to allow the technician to replicate the fit surface within the definitive bridge.

Compliance with ethical standards

Conflict of Interest: The author declares that he has no conflict of interest.

Informed Consent: Informed consent was obtained from all individual participants included in the article.

CPD ANSWERS JUNE 2025

1. A	5. C
2. C	6. C
3. B	7. B
4. C	