Perfect Imperfection – why interdisciplinary planning has to be done from the start

BACD Fellowship Submission

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This case includes the replacement of missing upper laterals and canines with implant retained bridgework. The treatment included home/power whitening, composite bonding and osseous laser gingival realignment and a combination of orthodontics and restorative disciplines.

Introduction

Emily first came to see me in May 2009 as she felt she wanted a cosmetic dentist rather than her regular general dentist to complete her aesthetic case.

She had been having one and a half years of clear aligner orthodontic treatment with a specialist orthodontist to align the lower teeth and open space for implant retained crowns at 13 and 23.

She had been told she now had enough space, had finished her orthodontic treatment and needed to find a dentist to place the implants and crowns to replace the missing upper canines.

On Examination it was clear that due to the splaying of the roots and the proximity of the roots of 14 and 24 to the existing implants at 12 and 22 this would be impossible without fixed appliance therapy to move the roots apart.

Emily was very disappointed and could not face more orthodontic treatment. It was decided to see whether it was possible to work with the existing teeth positions, as Emily had "had enough dentistry" over the last 15 years.

History

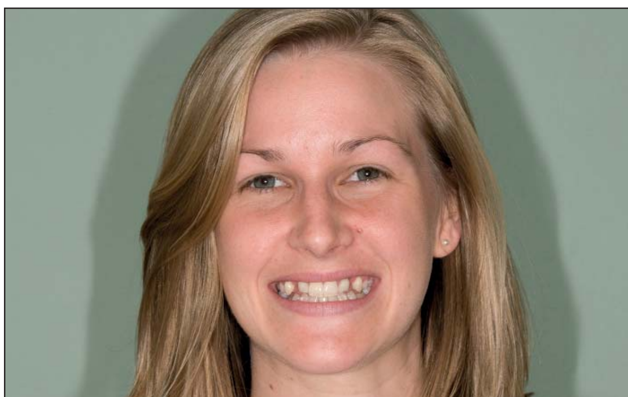
Clinical findings

Clinical examination 30.7.2009

Emily was in good health. The patient presented with a removable partial denture retainer at 13 and 23. She complained of sensitivity on the exposed dentine of the 14 and 24 cervical areas.

She was a regular attender at her local GDP in Tunbridge Wells. Fissure sealants at age 10 and then again at age 25 on all molars. Invisalign for the last 18 months with specialist orthodontist (41 extracted).

The previous dental visit was one year prior for a routine dental health



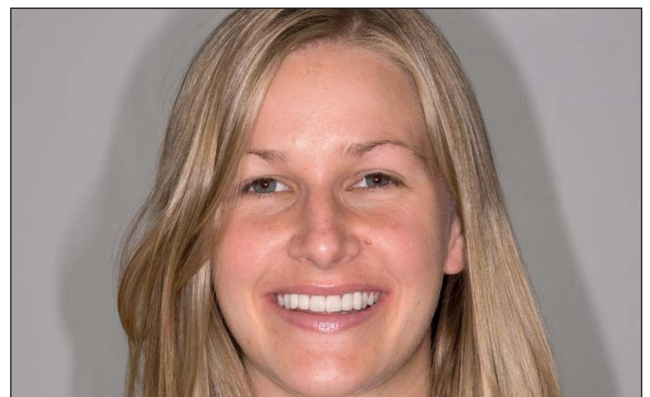


Figure 1: a-b – Smile views: *Before (left) and after (right)*

check and ongoing orthodontic treatment.

Face Head Neck: NAD
TMJ: Full opening with slight deviation to the left. The patient reported that she was prone to dislocation on the left side.

She also reported nocturnal bruxism with some tension headaches. She has worn a night guard in the past.

Oral hygiene: Quite good. Manual tooth brushing and does not like the feel of floss –so rarely uses.

Perio: The patient had a BPE score of 211/112.

Teeth: Caries free. The existing implants are sound at 12 and 22.

Wear: Light attrition on 11 and 21.

Occlusion: Mild Class 3 skeletal base with a mild Class 3 occlusion. Partial open bite at 12,13 and 14 and reduced overbite. Horizontal plane of chewing with non-working side interference.

Mobility: 41 due to orthodontics-final stages of lower *Invisalign*.

Appearance: Emily was unhappy about the missing canines and wanted natural looking lighter teeth. The implant crowns at 12 and 22 are of poor shape and are too white. They appear to be submerged in relation to the other upper anterior teeth. The gingiva above the implants is blue.

X-rays: The radiographs showed healthy sound implants and Birmingham University was contacted for a copy of the placement notes from 2002.

Diagnosis

- Partial anodontia with missing 12, 13, 22 and 23. Retained lower second deciduous molars with no lower second premolars

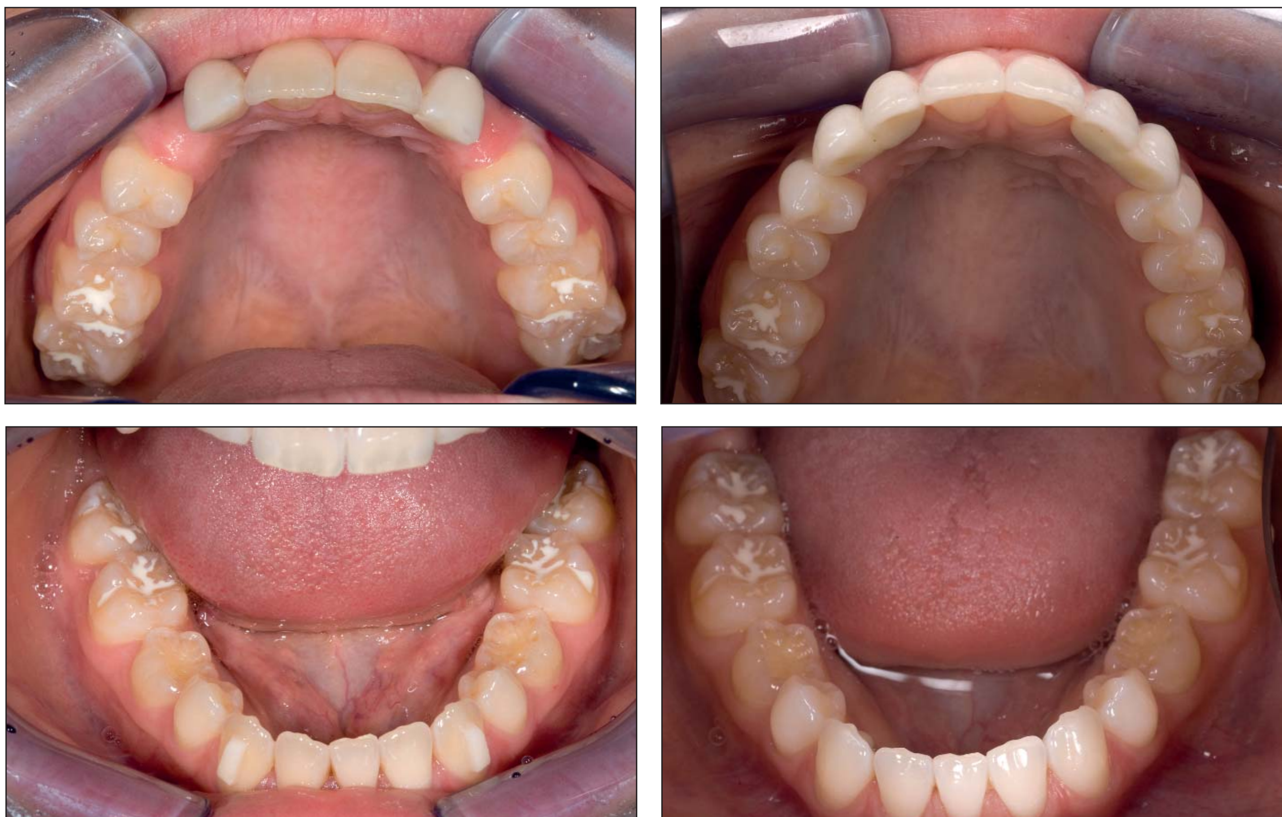
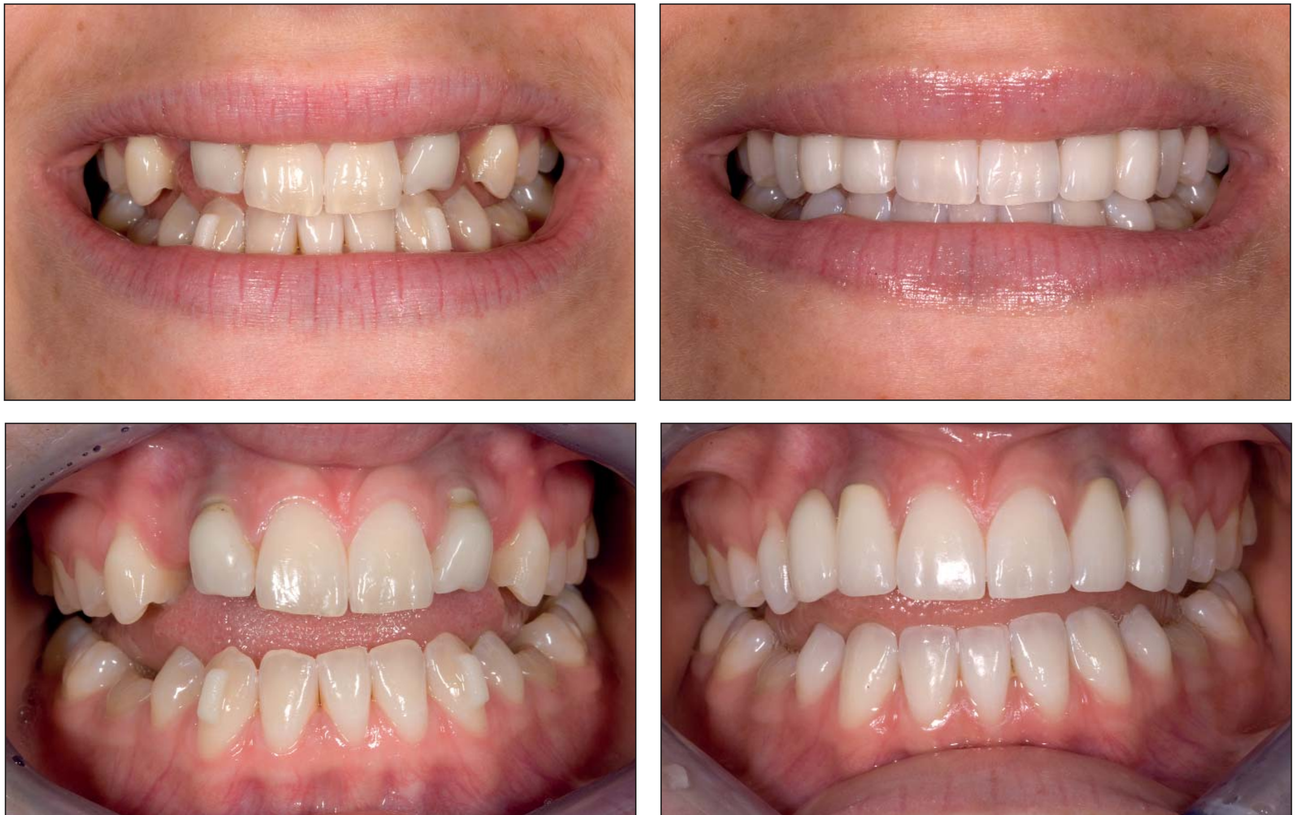


Figure 2: a-d – Upper and lower arches: *Before (left) and after (right)*

Figure 3: a-d – Anterior views: *Before (left) and after (right)*



- Gingivitis associated with only occasional interdental cleaning
- Mild TMJ dysfunction syndrome.

Treatment plan discussion

Emily had come for implants at 13 and 23. She was very disappointed about there being insufficient room as the orthodontist had led her to believe that there was.

I attempted to discuss the case in person with the orthodontist and was told he was far too busy to discuss individual cases! Emily in any event did not want to have any further orthodontic treatment.

We discussed the alternatives to replacing the upper canines with a permanent denture or bridgework. She did not want a removable plate so we looked at the fixed bridgework options. The existing Nobel Biocare implants were well integrated but very high and distally placed.

Bridgework options were:

1. 14 and 13 & 23 and 24 Maryland Bridgework[1] and new implant crowns at 12 and 22.
2. Cantilever bridgework 12 and 13, 22 and 23 with or without pink porcelain.

As the 14 and 24 were sound and we needed to replace the lateral incisor crowns anyway, Emily decided on option two. It is not normally ideal to replace a canine cantilevered from a lateral incisor. However, in this case the lateral incisor implants were distally placed almost in the middle of the canine and the lateral incisors and were strong sound implants.

Also the class 3 occlusion had bilateral group function which worked from 15-17 on the right and 24-27 on the left. The canines were therefore in a protected occlusal arrangement.

To increase the strength of the implants' foundations to a maximum the plan was to replace the Procera with stronger titanium abutments.

(However it was not possible to remove the 12 Procera abutment).

There was a large amount of missing bone and soft tissue where the canine pontic needed to be placed. I discussed osseous and connective tissue graft placement but once again Emily did not want further prolonged treatment. Also, the smile line was below the cervical margin so even in a wide smile, the necks of the teeth would not show. We therefore decided to work with what we had. My initial thoughts were to include pink porcelain as part of the necks to reduce the size of the lateral and canine teeth. However we

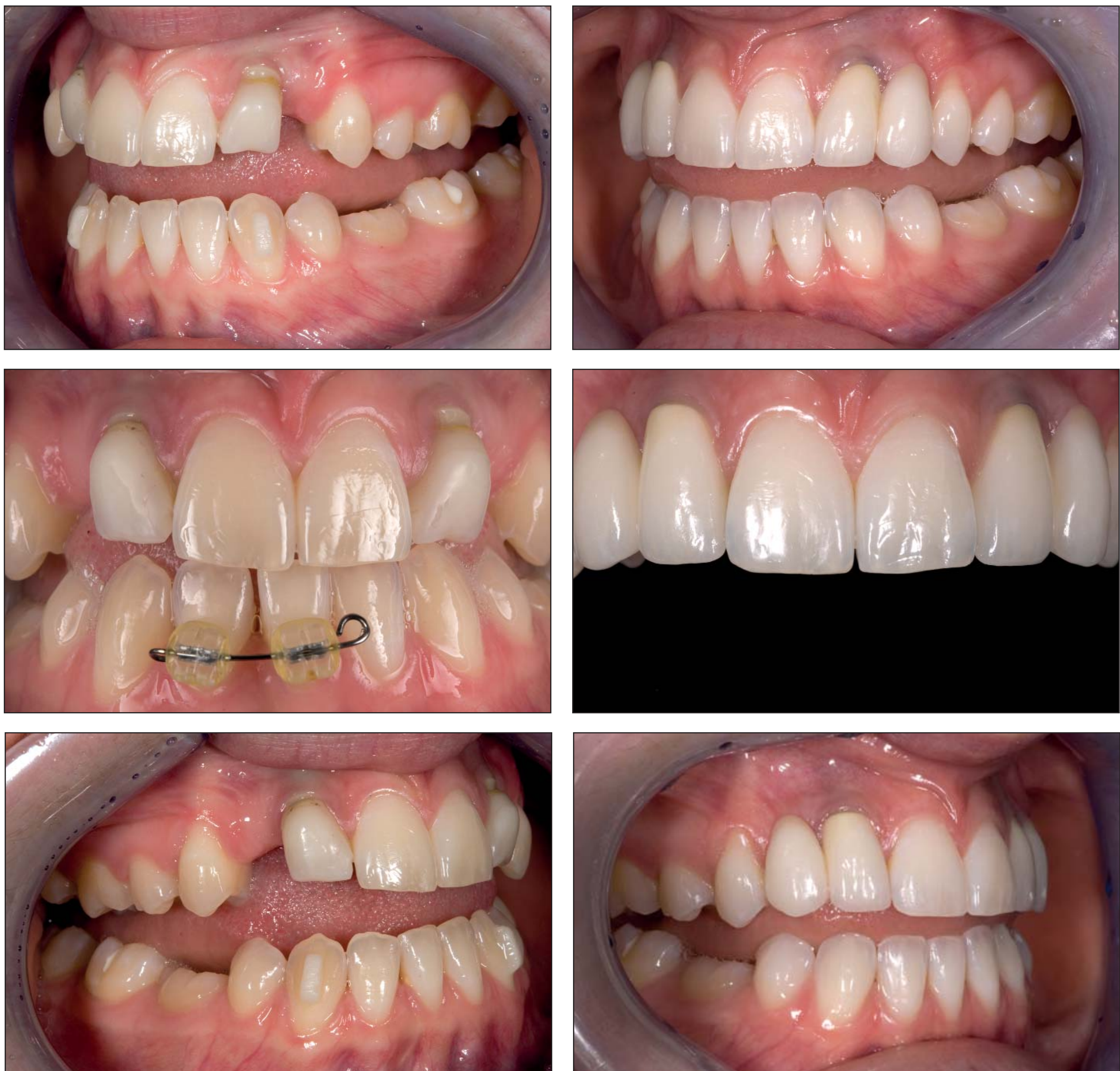
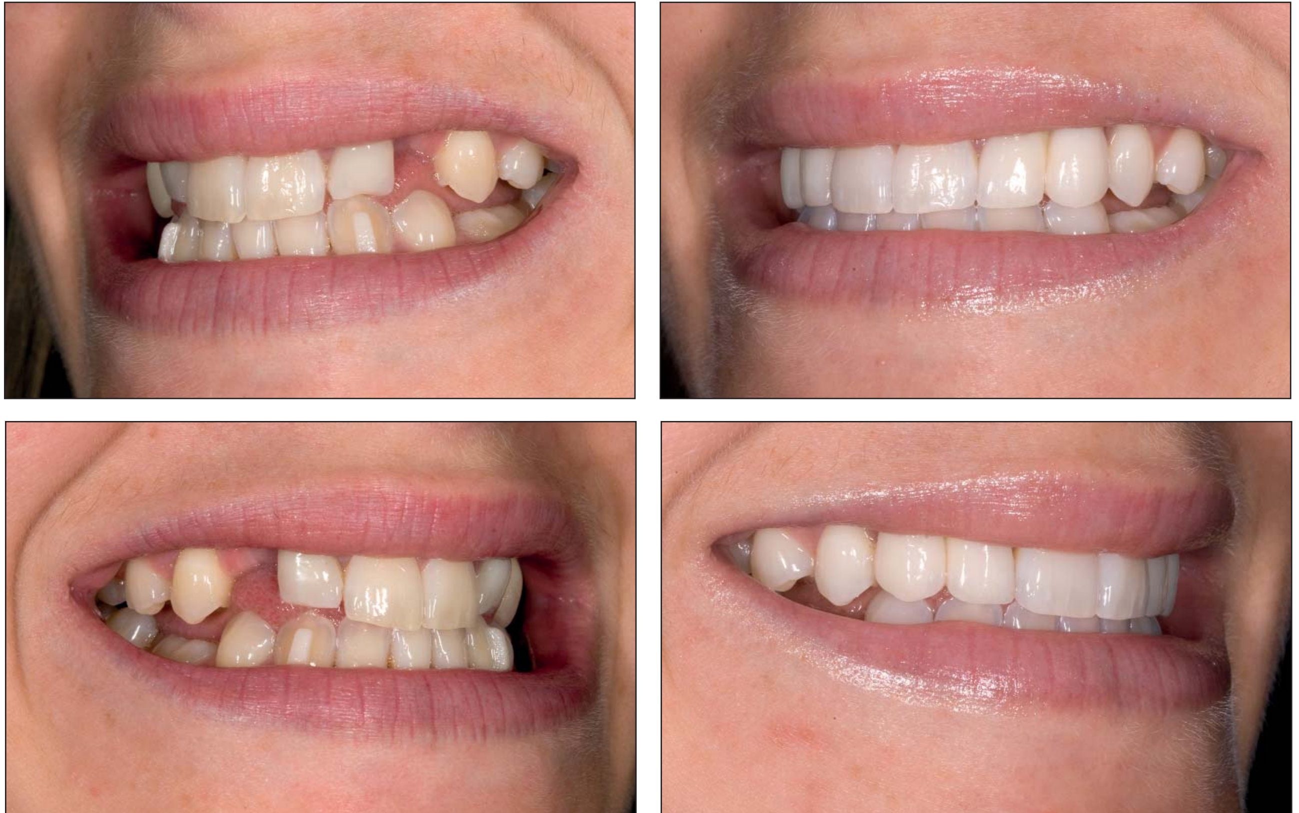


Figure 4: a-f – Left, central and right views: *Before (left) and after (right)*

Figure 5: a-d – Left and right smile views: *Before (left) and after (right)*

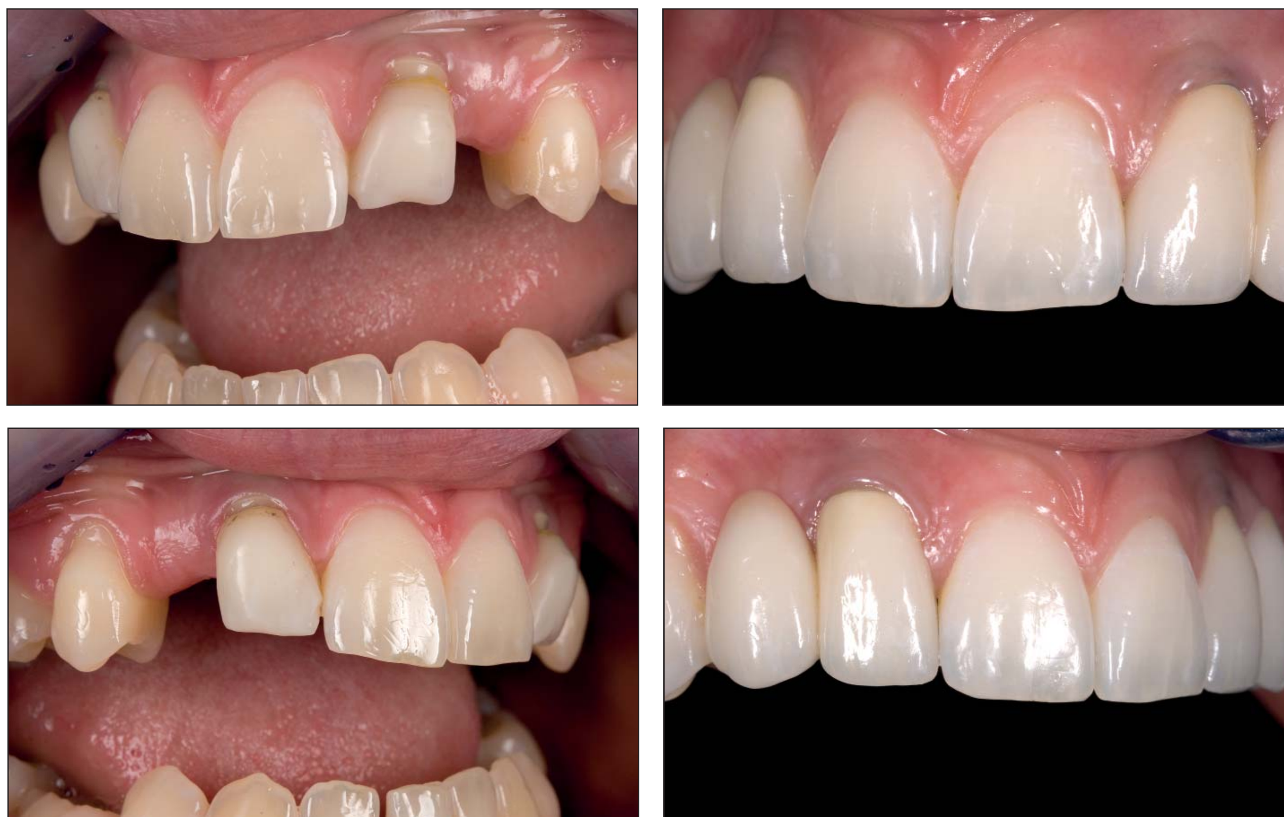


experimented with wax-ups and provisionals and we managed to achieve a good result in the visible smile area without resorting to the use of pink porcelain.[2-5]

Treatment

- New patient consultation: In depth consultation, full examination, BACD Cosmetic Assessment Form Completed. BACD Photo series taken
- Treatment plan put together and photo-simulation created of expected outcome
- Home whitening using trays: upper and lower impressions. Bite in CR & Denar MkII Facebow[6,7]
- Zoom 2 power whitening and trays with 10% carbamine peroxide gel (Nitewhite)
- Order Nobel Biocare titanium abutments to replace Procera abutments (as these would now be used as bridge abutments)
- Remove existing crowns and replace 22 with modified stock titanium abutment torqued to 35n. Could not safely remove 22 abutment so it was decided to accept it
- The ridge was lightly lasered (Waterlase) to provide a shallow ovate/ridge-lap compromise pontic site. Impressions were taken for lab made provisionals and A1 shade quicktemp temps placed. The 11 restored with Miras 2 to match the smile line[8,9]
- Lab made provisionals fitted with temp bond with addition of revolution flowable composite to the fit surface
- After four weeks the provisionals were removed and final impressions taken for Zirconium bridges. Shade taken and photographs.[10] Unfortunately the 12-13 bridge debonded a few days before and the pontic bed was a little indistinct. However Emily could not wait any longer as she was going travelling so it was agreed to make adjustments in the lab on the model
- Final bridgework tried in and was excellent match. Cemented with Zinc/Eug Tempbond

Figure 6: a-d – Left and right dentition views: *Before (left) and after (right)*



- 24 laser osseous crown lengthening was completed two months later as the low gingival line showed on her wider smile.[11]

Discussion

I decided to present Emily's case, not because it was perfect but because it highlights a common problem we are now seeing in practice. Firstly, there was clearly a failure of communication between the orthodontist and general practitioner where there was no clear final aesthetic outcome planned. Secondly, it highlights the problem of implants placed in young patients where their dentition has not matured. When it does mature the existing implants are then in the wrong place and will not allow for a good aesthetic outcome. Finally, Emily was also suffering from dental treatment burnout so simple fast results were required without complex remedial work to the pontic sites.

Conclusion

It is vital that in aesthetic cases involving a multidisciplinary approach, there be good and sufficient communication between the parties before the commencement of any treatment. Despite things going not quite as well as they could have, by careful aesthetic assessment and planning it has been possible to give Emily a beautiful new smile even though aesthetic compromises were made behind the scenes (above the visible smile line).

Acknowledgment

Technical work by Steve Rea of Reatech Laboratory.

References

1. Shillingburg HT, Hobo S *et al.* *Fundementals of fixed prosthodontics.* Quintessence Books, 1997.
2. Fradeani M. *Esthetic Analysis: A systematic approach to prosthetic treatment.* Quintessence Books, 2004.
3. Invisalign. Introduction to Invisalign. Oasis Clinical Conference, Northampton, Oasis Healthcare PLC, 2004.
4. Mew M. Clinical experience working with Platinum Level Invisalign Orthodontist, 2004.
5. AACD. Diagnosis and Treatment Evaluation in Cosmetic Dentistry: A Guide to Accreditation Criteria AACD, 2009.
6. Setchell D, Capp N *et al.* Occlussion (10 day Comprehensive Programme at the Eastman Hospital), Eastman Hospital, 1986.
7. Cranham J. Occlusion for the aesthetic based practice. Occlusion for the aesthetic based practice. Royal College of Physicians, London, Independant Seminars, 2005.
8. Freidberg P, Browne LS *et al.* Introduction to Restorative and Surgical Implant Dentistry, Cambridge, Straumann UK, 2005.
9. Dietschi D. Excellence in Adhesive & Aesthetic Dentistry: Integrated Lecture & Workshop. Excellence in Adhesive & Aesthetic Dentistry, Geneva Smile Centre, 2007.
10. Chu S. Fundementals of Colour and Shade Taking. BACD Annual Conference, London, 2007.
11. Lowe RA.Clinical use of the Er,Cr: YSGG laser for osseous crown lengthening: redefining the standard of care. *Pract Proced Aesthet Dent* 2006 **18**: S2-9; quiz S13.