Smile Awards case study: Interdisciplinary Smile

Shameek Popat was the winner of Interdisiplinary Smile Award this year. Read his winning case study which makes use of comprehensive dentistry with planning that involved the orthodontist, **Shaunak Popat**, implant surgeon, periodontist and dental technician

SMILE AWARDS2011 WINNER

Introduction

The patient was a 48-year-old male who presented with a missing upper right central incisor which for a number of years had been replaced by a removable upper acrylic denture. He also had spacing, misaligned teeth, vertical maxillary excess, hypermobile lip, irregular incisal tips, chipped front tooth and wanted a whiter smile. This case report illustrates use of comprehensive dentistry with planning that involved orthodontist, implant surgeon, periodontist, dental technician colleagues and myself.

History and patient's complaints

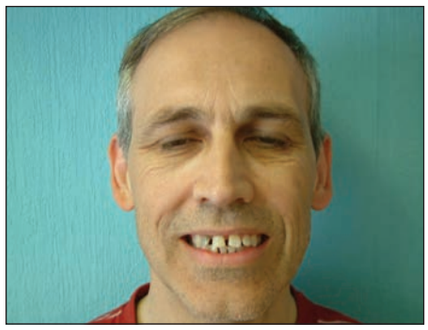
Mr JR, a 48-year-old male attended complaining of unsightly teeth, missing front tooth which was replaced by a removable upper acrylic denture, he kept his lips closed for photographs and was conscious of his teeth when meeting people for the first time. As a child he had avulsed his front tooth out and had some of his posterior rear teeth removed which caused his teeth to spread out leaving gaps. One of his front tooth was dark, he had gum shrinkage around the missing tooth and the upper left central tooth had a chip in it. He was also not happy with the colour of his teeth. He was now keen to get some aesthetic treatment done but did have a budget.

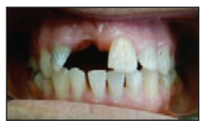
Medical

He was allergic to septrin and wasp stings. There was no other clinically significant medical history.

Dental

The patient was a reasonably regular attender to a dental practice. He had suffered trauma to his upper central incisor at a young age and had been wearing a removable upper acrylic denture for a number of years. His upper right lateral was dark due to a large palatal amalgam filling done a number of years ago. The tooth responded to an electric pulp tester and was vital.





Figures 1a and b: Pre-op views

Examination

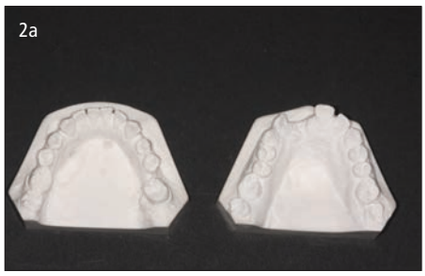
Head/Neck: No abnormality detected (NAD)
Face: VME and hypermobile upper lip
TMJ: normal opening, no tenderness present
Soft Tissue: NAD
Periodontal condition: BPE 222/222, mild calculus build up lower anteriors, mild vertical bone loss LL8
Appearance: Disliked the appearance of his teeth, missing tooth, spacing, dark tooth, chipped tooth and wanted whiter teeth.
Smile Assessment: Full smile design assessment of the teeth and their relationship to the soft tissues and full face
Radiographs: Two Bitewings, one periapical and Panoral Radiograph.

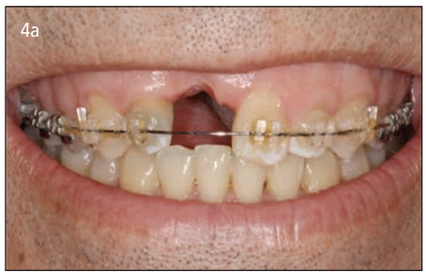
Diagnosis

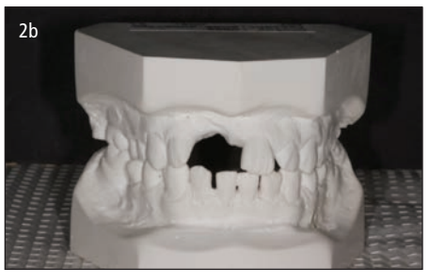
- Missing UR1 with loss of bone and connective tissue
- Misaligned teeth with spacing
- Dark UR2 due to old Amalgam filling
- Chipped UL1
- VME
- Hypermobile Lip and high lip line

Treatment options

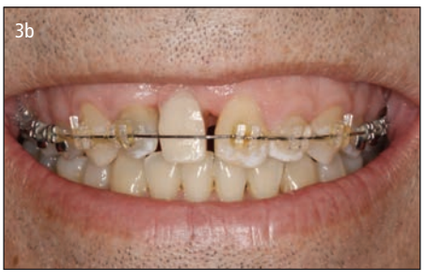
Option 1: No treatment, Maintain current prosthesis, this option was not going to be taken by the patient as he had been waiting and



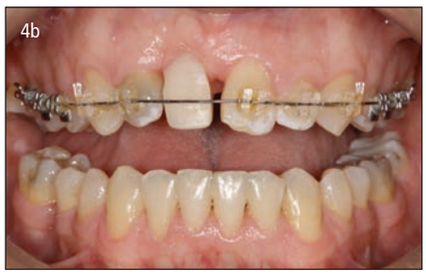




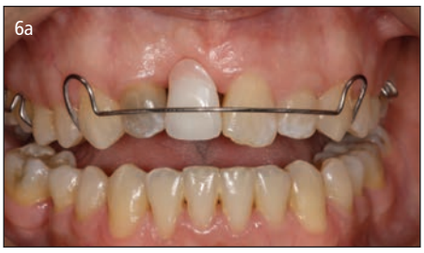
Figures 2a and b: Pre-op models

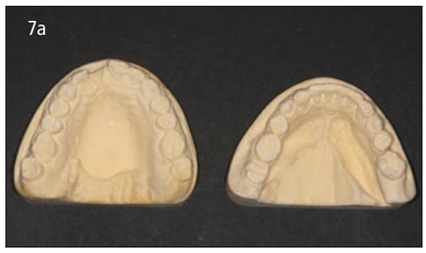


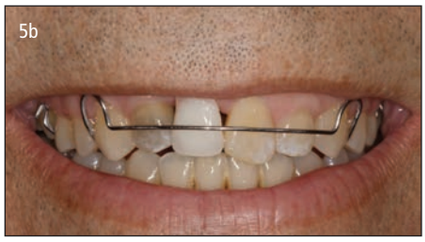
Figures 3a and b: Orthodontic treatment



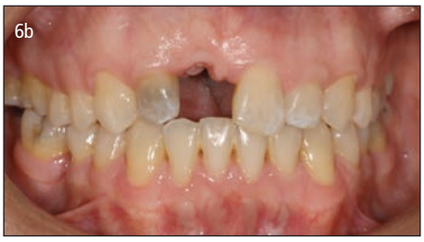
Figures 4a and b: Retracted views



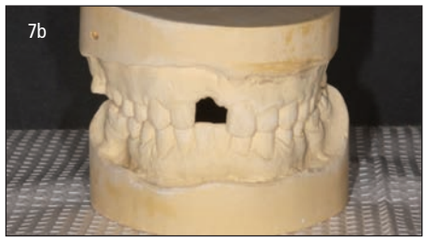




Figures 5a and b: Retainer with UR1



Figures 6a and b: Post-orthodontic treatment



Figures 7a and b: Post-orthodontic models

saving up for a while to have something done. Option 2: Chrome Denture, Patient had been wearing an acrylic denture for a long time and wanted a fixed and a good aesthetic option now. Option 3: Orthodontics, Implant, 3 Veneers-Orthodontics to align and level the arches, bone and connective tissue graft with Implant for missing UR1, composite filling UR2 and veneers for UR2, UL1 and UL2

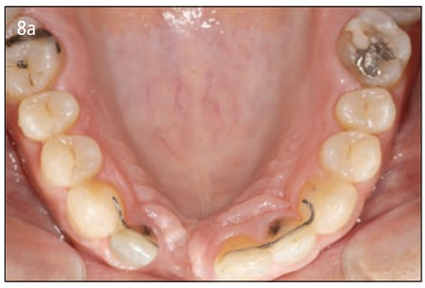
Option 4: Orthodontics to align and level the arches, Ovate Pontic surgery and gingivectomy, Composite filling UR2, 3 Unit Zirconia Bridge, Pressed Veneer UL2 and tooth whitening.

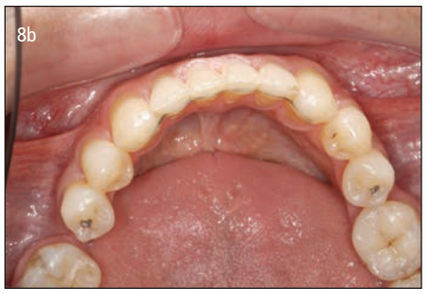
Patient rejected option 1 and 2 and we had a multidisciplinary consult with the orthodontist, Implant surgeon and myself with the opinion of the dental technician with regards to option 3 and 4. It was generally agreed that the aesthetics would be better controlled with the ovate pontic surgery and bridge due to the patient's high lip line and loss of bone around the missing UR1. This was agreed by the implant surgeon and the dental technician who would have been able to control the black triangles and use pink porcelain if necessary with the bridge option. The fixed-fixed bridge could be provided with little additional preparation as the patient was going to have pressed veneers on the abutment teeth and it would be easier to mask the dark tooth upper right lateral discoloured due to an old amalgam filling palatally. The patient was informed that the bridge will probably need changing in 10-15 years and there was risk of the abutment teeth needing root canal treatment. Also, taking into account the extra costs and time involved with the implant the patient decided to go for option 4.

The patient was also offered the option of maxillofacial surgery to reduce the vertical maxillary excess and botox for the hypermobile lip but patient declined these treatments.

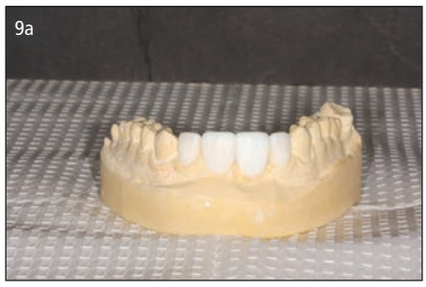
Treatment

Initial impressions and photographs were taken (Figure 1). We had the advantage of having specialist in house so were able to arrange a co consult appointment with the periodontist, orthodontist (sister practice down the road) and the implant surgeon to work out an acceptable treatment plan for the patient. The dental technician had sent his opinion with the models

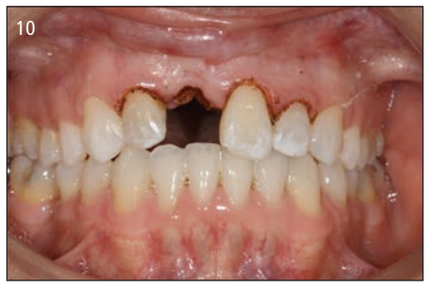




Figures 8a and b:Upper and lower occlusal views



Figures 9a and b: Diagnostic wax-up



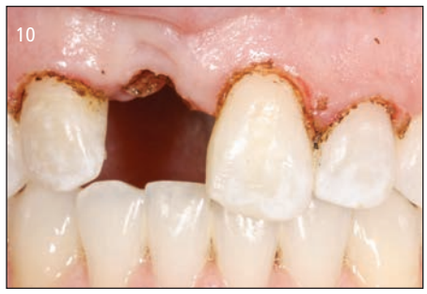
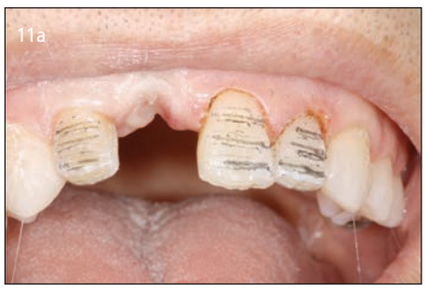


Figure 10: Ovate pontic and crown lengthening laser surgery



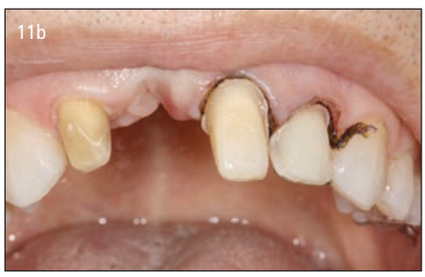
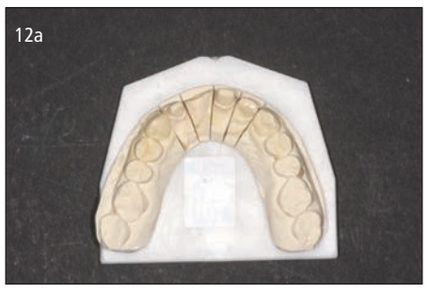
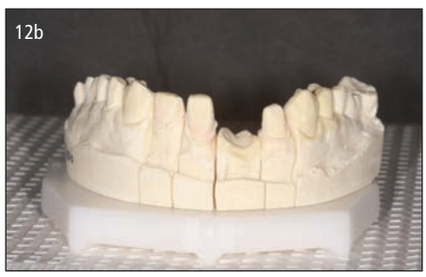
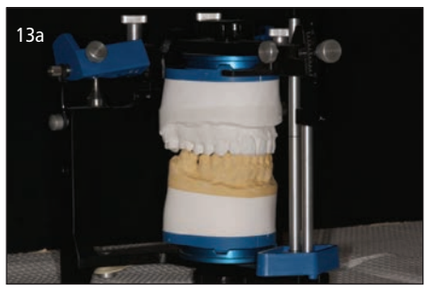


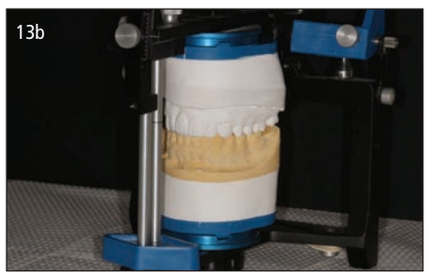
Figure 11a and b: Prep and retraction views





Figures 12a and b: Prep models





Figures 13: Articulated temp models with wax build up

and photographs. The patient attended the hygienist to have a maintenance scale and polish and oral hygiene instruction and was put on a three monthly hygienist program while he had his braces.

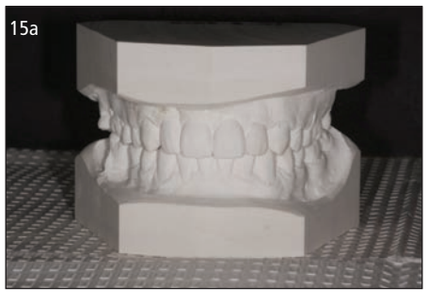
The patient then attended the orthodontist to (Figures 2-8):

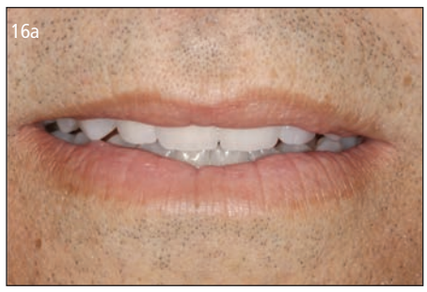
- Align and level the arches,
- Close lower arch labial spaces and reduce upper arch space and consolidate to UR1 for restorative management from 13mm to 9mm
- Correct incisor and molar relationship to class 1,
- Retention, short term until restorative phase and thereafter long term. The orthodontist and I met regularly over lunch periods to discuss the progress of the case. At the finish of the orthodontic treatment the patient was fitted with fixed lingual and palatal 0.0175' twist flex stainless steel retainers. Additionally he wore a removable retainer with a pontic at UR1. Minor equilibration was carried out after the orthodontics to fine-tune the occlusion. Impressions and photographs were taken for a diagnostic wax up and all the various stents such as prep guide, temp guide, suck down gum guide were made. The patient then saw the therapist for hygiene visit and impressions were taken for close fitting upper and lower trays for home whitening. He was given a 10% carbamide peroxide (optident nitewhite) to be used overnight for three weeks. A desensitisation pack was included in his whitening kit. The result at the end of the whitening process was satisfactory to the patient.

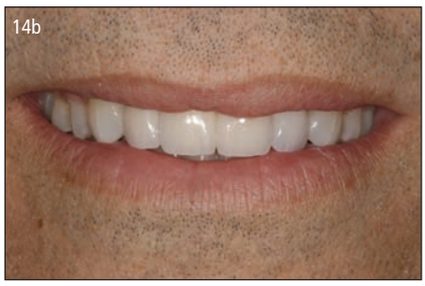
The old palatal amalgam fillings on the UR2 and UL2 were replaced with Composite A1 (Tetric Ceram) prior to tooth whitening.

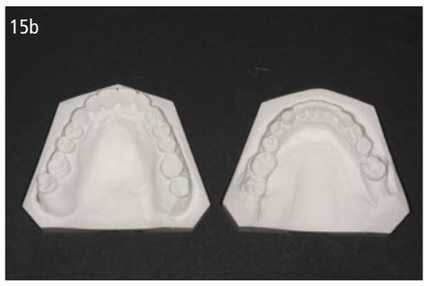
On completion of the whitening, two weeks delay was allowed for colour stabilisation before proceeding to the next stage. After consulting the periodontist, I performed the ovate pontic surgery and laser gingivectomy.

We did a ridge evaluation as taught by Frank Spear taking into account









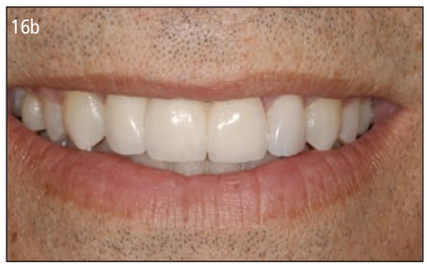
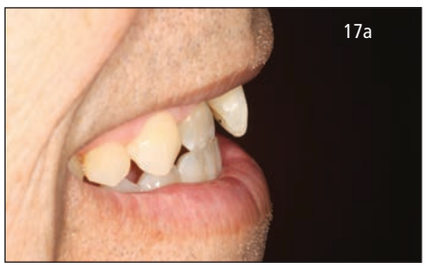


Figure 14: Post-op views

Figure 15: Post op models

Figure 16



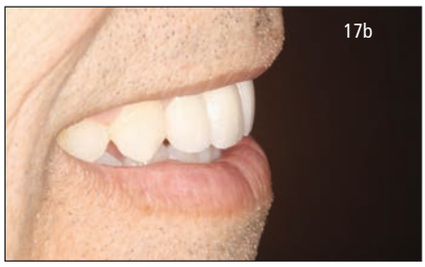
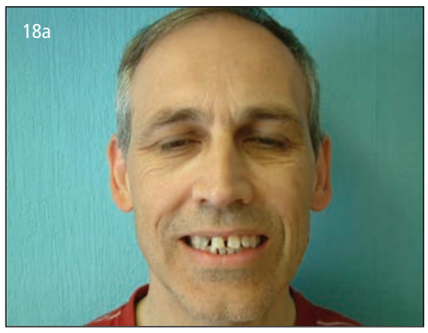


Figure 17: Before and after smile



Figures 18a and b: Full face shot before and after

- Interproximal height
- Free gingival height
- Facial prominence

The ridge was stable as the tooth had been lost for a number of years. As defined by Leonard Abrahams the convex pontic form embedded into the sulcus has to be 2mm from the underlying bone. On bone sounding we had 3 mm available, so we could remove 1mm without having to remove the underlying bone.

Also, bone sounding under LA was carried out on the UR2, UL1, UL2 showing a biologic width of 4mm. As 3mm is normal as defined by John Kois, this meant we could raise the gingival margin by 1mm without having to perform osseous surgery. Using the gingival stent from the diagnostic wax up ovate pontic surgery and gingivectomy on the UR2, UL1, UL2 was carried out. The bone was sounded again to make sure we were not violating biological width and that in the sulcus site we were 2mm away from bone. The UR2 and UL1 were prepared for Zirconia bridge abutments and UL2 for a pressed veneer using the prep guides. Temporary bridge and temp veneer was made using Luxatemp. The pontic site on the bridge was relined with Luxaflow to maintain an egg shape pontic. This was then cemented with temp bond clear. The patient was then sent home and an appointment made for four weeks for healing to take place.

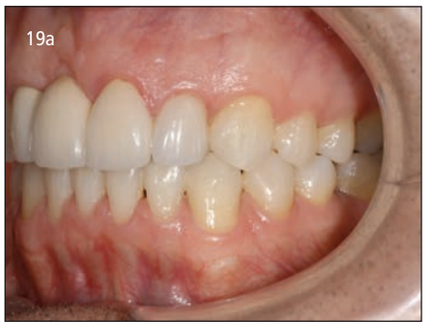
After four weeks the patient returned and the temporary bridge was taken off. The ovate pontic site was evaluated and was found to be satisfactory. An addition cured silicone impression was taken immediately for the lab to construct a soft tissue model. As water will start filling up the ovate pontic site and give you a false impression if you wait till after the final preparations are done.

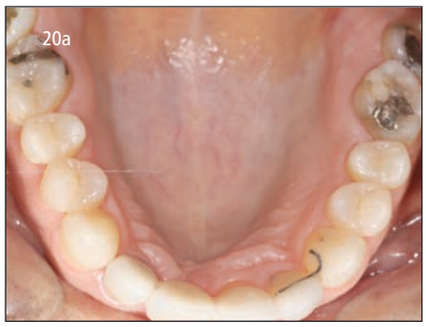
Minor gingival recontouring was carried out using a soft diode laser and the preparations were finalised using a using a 00 cord retraction. Master impression was taken with an addition cured silicone using the double cord technique. Bites and stump shades were recorded. New luxatemps were made and bonded with temp bond clear. Facebow was taken using the Kois facial analyser and models were articulated using panadent articulator. After three days the patient came in for a review to check occlusion, phonetics and colour. The temps were a little short and there was a reverse smile line. This was corrected using luxaflow. Impressions were taken to convey the new information to the lab and instructions to the lab were finalised. The patient attended the lab for a shade match (Figures 9-13).

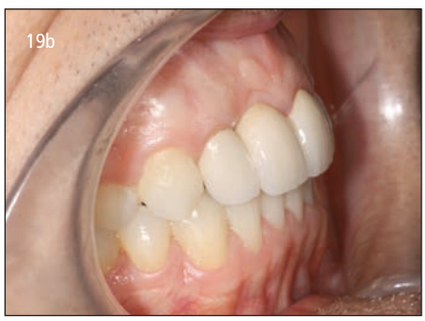
After three weeks, under LA the temps were removed and the zirconia bridge and pressed veneer were tried in with Vitique transparent

try in gel. The colour match was confirmed by the patient. The veneer was etched for 60 seconds, silane primer was placed for one minute and then air dried, Bisco One step was placed on the fit surface and air dried. The veneer was placed in a covered holder while the UL2 was prepared.

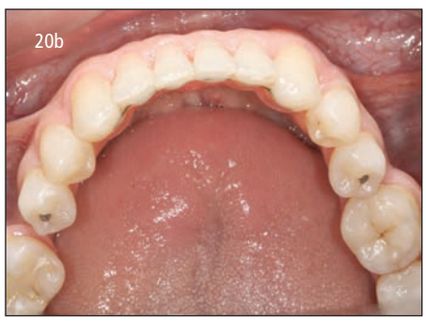
The tooth was air abraded, then etched for 15 seconds, Bisco One step bond was worked on the surface for 30 seconds, dried and light cured. The veneer was bonded using Transparent Vitique base and cured for 10 secs. The excess was removed and contacts cleaned with a saw. Glycerine gel was applied for the oxygen inhibition layer and the veneer was light cured in all directions. UR2 and UL1 were air abraded and the zirconia bridge (3M ESPE Lava Zirconia) was bonded using transparent Rely X Unicem. A size 12 scapel was used to clean the margins, yellow interdental strip to polish interdentally and the ceramic work polished with porcelain polishing kit. The occlusion and phonetics were checked (Figures 14-18).







Figures 19a and b: Right and left lateral views



Figures 20a and b: Upper and lower occlusal views

Maintenance and future treatment

He has a continuing care regime of hygiene visits every four months and good home care. He has a lower fixed retainer and an upper removable retainer that he wears a few nights a month. Patient is aware that he will need his over erupted UR8 extracted but does not want it done yet as it causes him no problems and is not interfering with his occlusion yet. New whitening trays were made to maintain the colour of the rest of the teeth. Patient was offered botox to control his hypermobile upper lip but once he knew what was happening he learned how to control his upper lip to hide his VME and did not need botox. It was infact difficult to replicate the initial gummy smile photos without getting him to exaggerate his smile.

Conclusion

Both the patient and I are delighted by the end result and to quote the patient: 'I now have good looking well shaped white teeth with no gaps, no overbite and a symmetrical teeth-gum line. The overall improvement in the look of my teeth, gums, my smile and my overall look is immense. I now smile properly when I meet people.'

Acknowledgement

I am grateful to the Orthodontist Dr Shaunak Popat who did a great job in aligning the arches, closing the spaces and levelling the arches. The feedback and opinion's of my periodontist and implant surgeon. I would also like to thank Luke Barnett and his team for their input in the case and their beautiful ceramic work. A

Dr Shameek Popat qualified from Guy's Hospital in 1993 and obtained his MFGDP from the Royal College of Surgeons in 1998. Over the last 15 years he has won 'Private Dentist of the Year' award at The Private Dentistry Awards 2010 and the prestigious title of 'Best Practice in the South East' at the Dentistry Awards 2009. He has also won four of the prestigious 'Smile Awards'. In 2010, he won 'Restorative Smile of the year', the highly commended award for 'Patient Smile', and highly commended for the overall 'Smile of the Year Award 2010'. This year he was the winner of the Interdisciplinary Smile Award. He is also a top instructor for the Californian Institute of Cosmetic Dentistry (CCADS UK), an active member of the British Academy of Cosmetic Dentistry (BACD) and a member of the American Academy of Cosmetic Dentistry (AACD). He is also a member of the British Dental Association, British Dental Health Foundation and the British Society of Occlusal Studies.