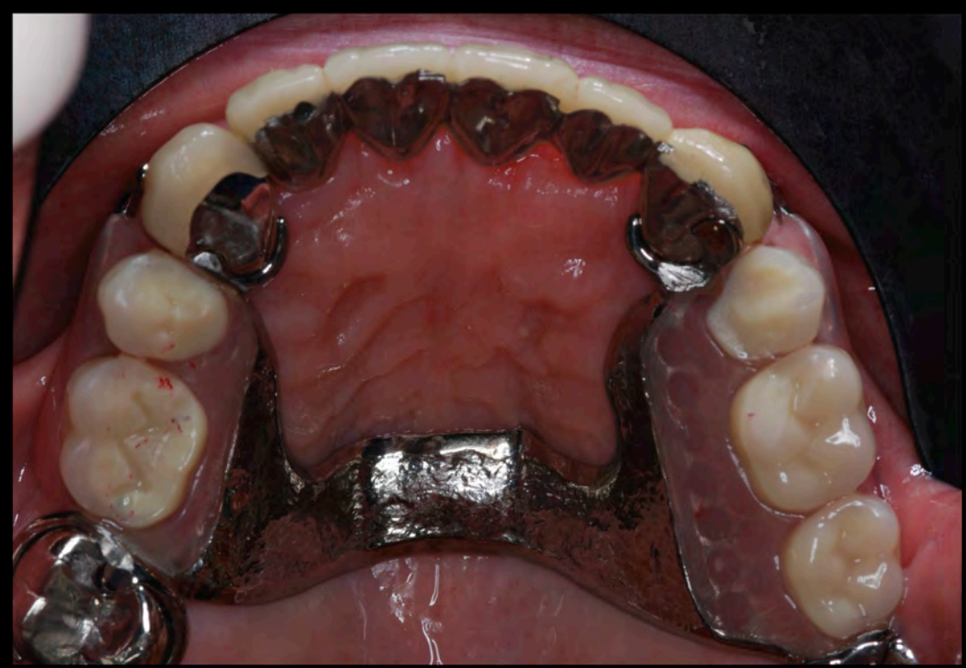
Comprehensive case Mr S

Failing bridge removed, 3 crowns placed, metal denture, and multiple root canal treatments



Mr S presented as a new patient 15/7/10 having previously been treated in the School of Dentistry Belfast. S's presenting complaint was of a failing upper left bridge, he had no other issues with his teeth.

Medical History

- used to smoke 10 a day untill 6 yrs ago
- taking statins to control cholesterol

Extra - Oral Examination

- no TMJ clicking/crepitus/pain
- no limitation/deviation on opening
- no swelling/asymmetry/tenderness
- no headaches

Intra - Oral Examination

- sinus buccal to 46
- otherwise soft tissues healthy
- Bridge spanning from 24 - 27 has decemented from the 24 and is being retained by only the 27
- generally a very heavily restored dentition

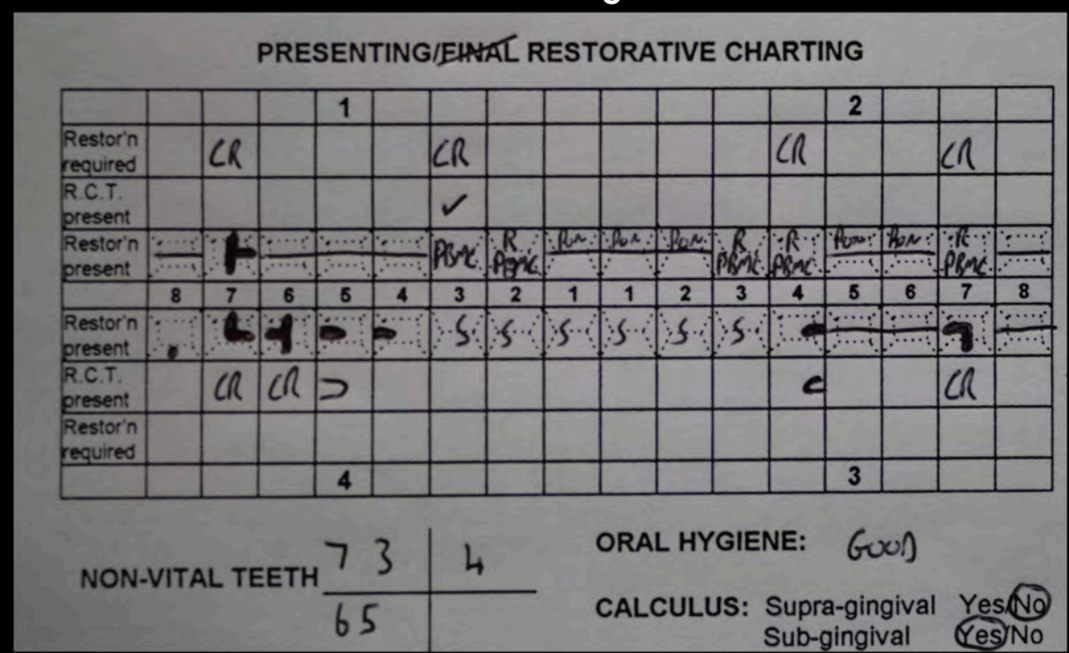
Vitality tests

- 17,24,45,46
respond negative to endo frost

Occlusion

RCP not equal to ICP
First contact in RCP - DL cusp of 27
Slide is mainly vertical
Wear facets seen on 34 33 43
Porcelain # seen on 24
NWSI seen on 27
Mild evidence of grinding however likely to be attributed to previous palatal porcelain on opposing restorations
No tongue/cheek faceting
Class 1
Skeletal Base 1

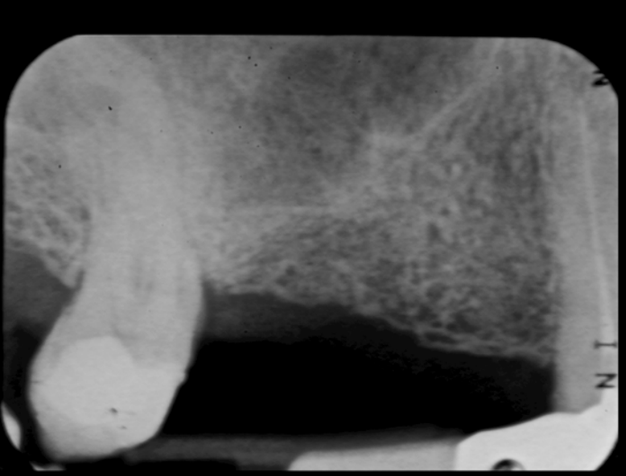
Charting

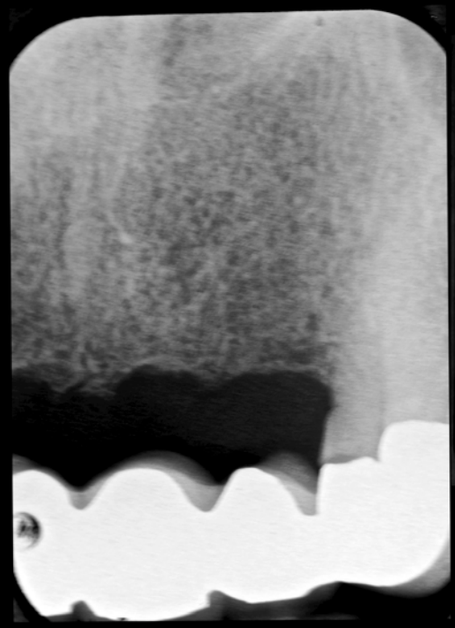


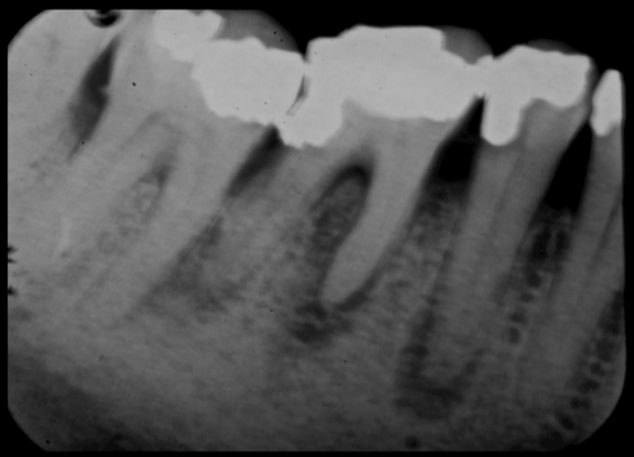


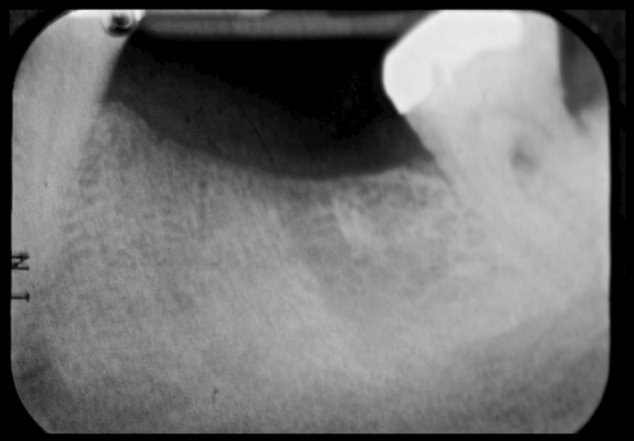
Intra Oral Photos 18/8/10


Radiographs - taken 15/7/10





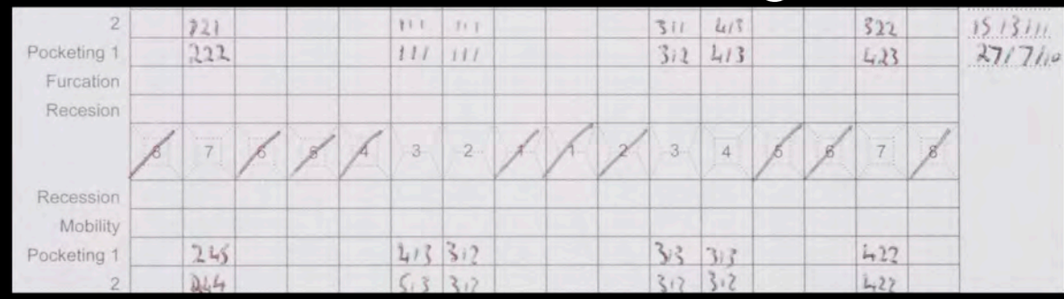


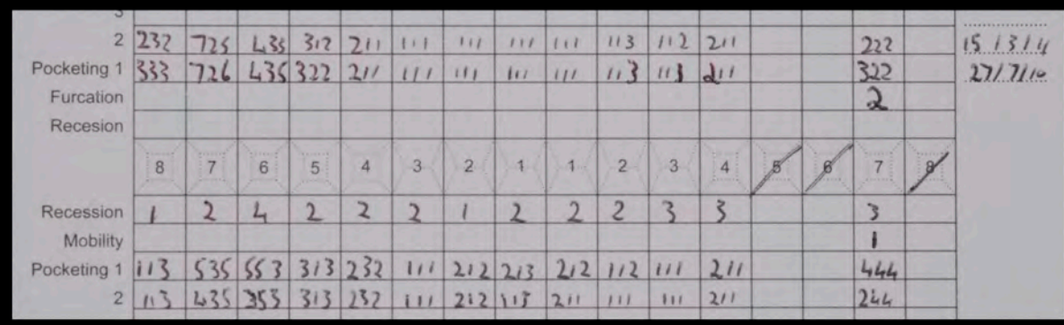


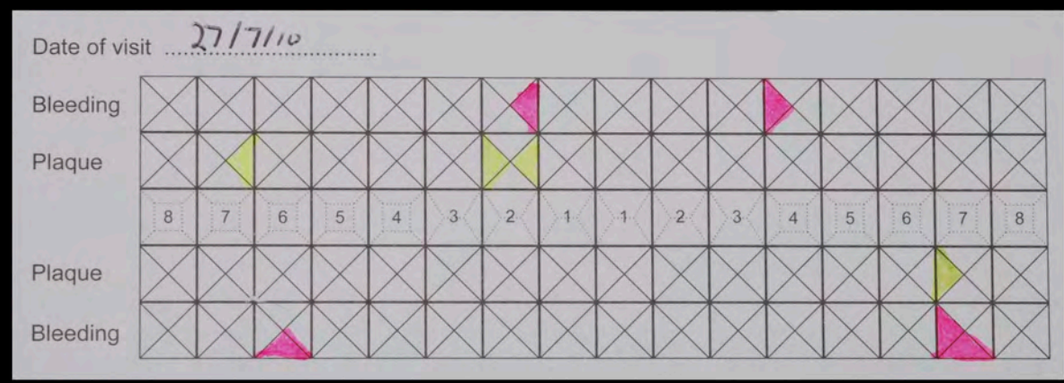
Radiographic Findings

- In the upper arch there has been approximately 4 mm of generalised bone loss
- The lower arch has has 2 mm of generalised bone loss with localised vertical defects related to the 47
- The upper left maxilla has very little bone - potentially complicating future implant placement
- 17 appears to have peri-apical pathology and is heavily filled, however has long roots and good bony support
- 13 is root filled and has peri-apical pathology, the root treatment is 3-4 mm short and poorly condensed
- 12 appears sclerosed coronally, though the canal is evident apically with no pathology
- 24 appears totally sclerosed with no evidence of any peri-apical pathology
- 37 appears to have periodontal furcation involvement
- 45 has a 5 mm diameter peri - apical lesion
- 46 has peri-apical lesions related to both mesial and distal canals, is heavily restored and has a large overhang contributing to a vertical distal bony defect
- 47 is heavily filled with sub-gingival calculus and vertical bony defects

Periodontal Findings







- 37 has grade 1 mobility presumably due to the NWSI on this tooth
- Very little bleeding on probing and very little plaque evident
- Grade 2 furcation involvement of 37 and 46
- localised pocketing > 4 mm around 47

Discussion on treatment planning

There were a myriad of options available to restore this gentlemans failing dentition. The ideal solution would have been to reorganise the occlusion in RCP via implant retained bridgework and single unit tooth supported crowns on the top arch along with three crowns and 2 implants on the lower arch with the necessary endodontic and periodontal treatment.

Unfortunatley during discussions as to the various treatment options it emerged that this gentleman had a somewhat limited budget available. This limited budget ruled out any kind of implant solution as well as removing/replacing the anterior bridge which he was very happy with. The crowns on the lower arch were to be deferred also.

On these grounds it was decided that the best option available was to restore the posterior edentulous space with a denture and to conform to the existing occlusal scheme.

After discussions we decided that if possible we would construct a denture with a metal framework in conjunction with crowns on 17,13,24,27

It was agreed that treatment would progress in a phased approach as while the bridge was decemented it had been this way for some time.

Stage 1 - Stabilisation
Endodontic therapy on teeth 17,23,45,46
Ultrasonic debridement to remove sub gingival plaque along with oral health advice
Composite filllings 34,44,45
Amalgam nyyar cores 17,46

Stage 2 - Reconstruction
Metal crowns 17,27
Porcelain bonded to metal crowns 13,24
Titanium denture to replace 16,15,14,25,26
Provisional acrylic denture

Stage 3 - Maintennance
Regular hygiene visits

At this stage Mr SM was provided with a letter outlining the proposed treatment and costs (see appendix). Written consent for the use of the photographs was also obtained (see appendix).

Sequence of treatment

Visit 1 15/7/10
New patient consultation, radiographs taken

Visit 2 27/7/10
Special investigations, vitality testing, full periodontal charting, articulated models in RCP

Visit 3 18/8/10
Proposed treatment plan, consent obtained and photos taken

Visit 4 2/9/10
!st stage rct 45,46

Visit 5 3/9/10
2nd and 3rd stage RCT 45,46 composite fillings 44,45

Visit 6 6/9/10
Amalgam nyyar core placed 46, 17 RCT and nyyar core completed

Visit 7 20/9/10
Full mouth deep clean and oral hygiene instruction

Visit 8/10/10
13 RCT completed and duralay post constructed

Visit 8 12/10/10
Cast post core inserted, tempory crown placed. Defective bridge removed. Gross caries detcted in 24. Attempted RCT however nerve sclerosed. Discussed with Mr S and decided to retain as an overdenture abutment.

Visit 9 4/11/10
Prep 17, 27 for metal jacket crowns. 13 prep for porcelain bonded to metal crown. Facebow taken. Lab to construct upper acrylic denture at same time

Visit 10 30/11/10
Crowns 17,27,13 inserted with zinc phosphate, provisional denture inserted and occlusion refined

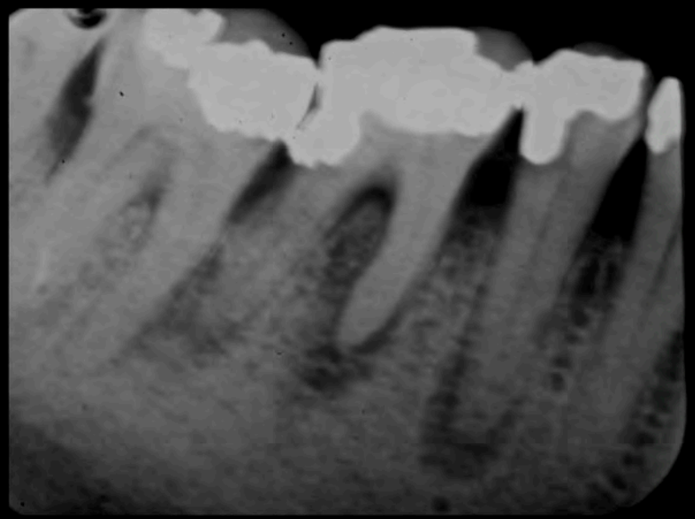
Visit 11 10/1/10
Master impressions

Visit 12 10/2/11
Try in framework, registration taken on wax rims mounted on framework and facbow taken. Composite filling in 34

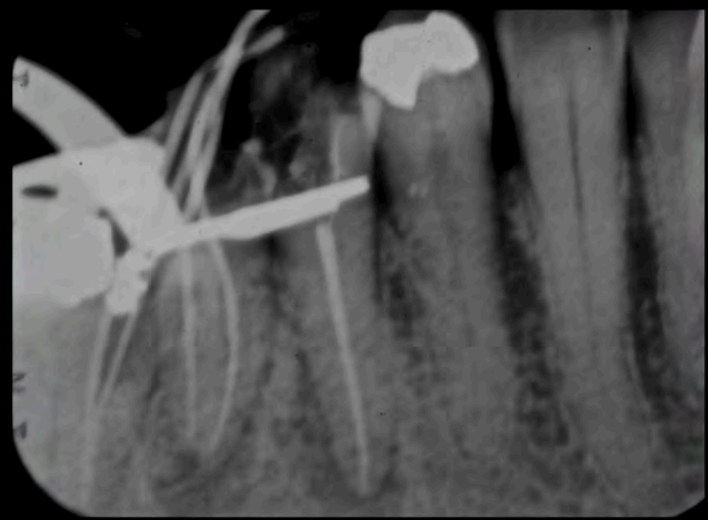
Visit 13 8/3/11
Insert Denture

Visit 14 15/3/11
Review denture, final photos, radiographs

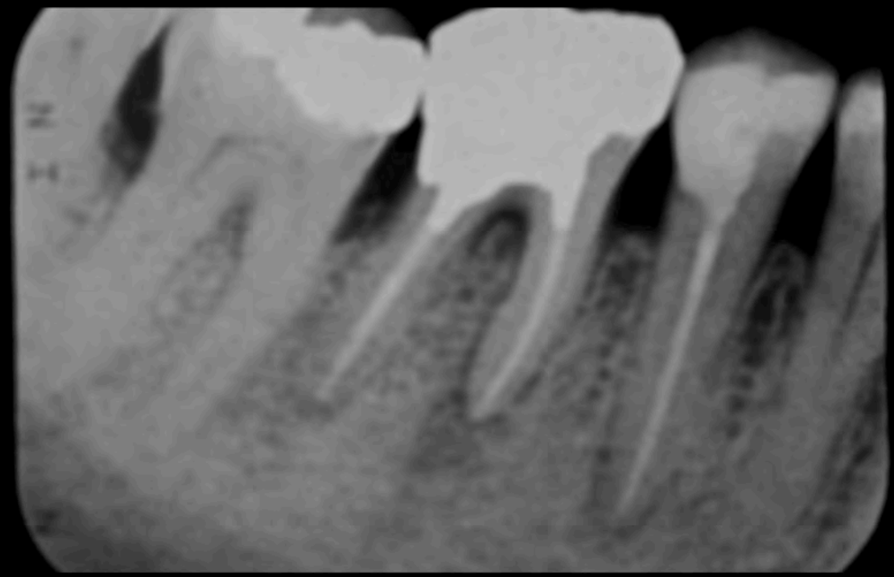
Root treatments 45,46



At the first visit 2/9/10 teeth 45,46 were isolated and the existing restorations and caries was removed, 4 canals were identified in 46 with a size 10 flexofile, the access was flared coronally with S1 Protaper and the tooth was continiously irrigated with sodium hypochlorite. The canals were dressed with non setting calcium hydroxide.

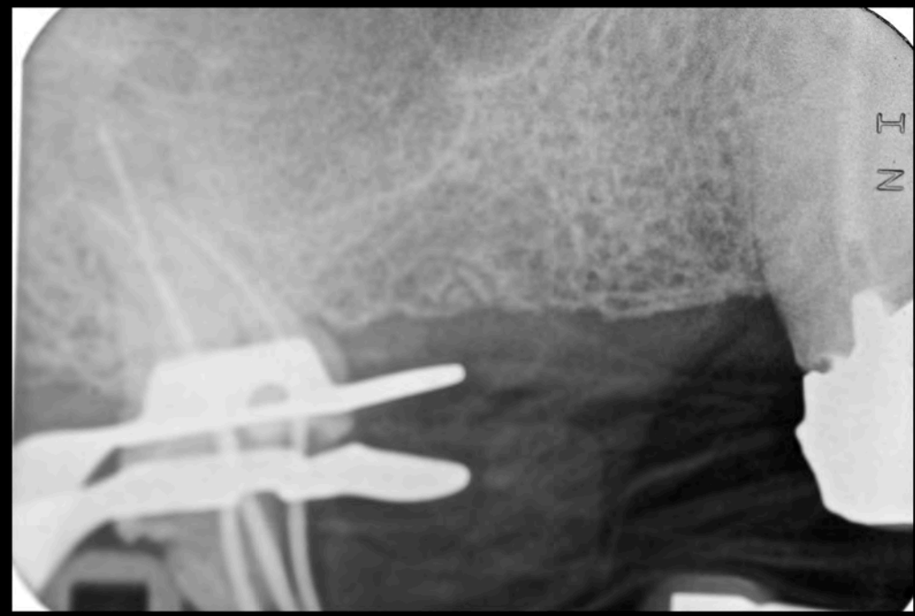

Unusually 2nd stage RCT was carried out the next day, using an apex locator to determine the working length. Canals were worked up to size 20 flexofile .5 mm short of the working length and then the 46 canals were worked to F3 protaper while maintaining patency. 45 was worked to MAF 40 flexofile with step back while maintaining patency. Sodium hypochlorite was used throughout with a 17 % EDTA solution and then finally 2% chlorhexadine (this would now only be used in retreatment cases). A check radiograph was taken to verify lenghts and the canals were obturated. 45 obturated using cold lateral condensation and 46 using protaper GP points only.



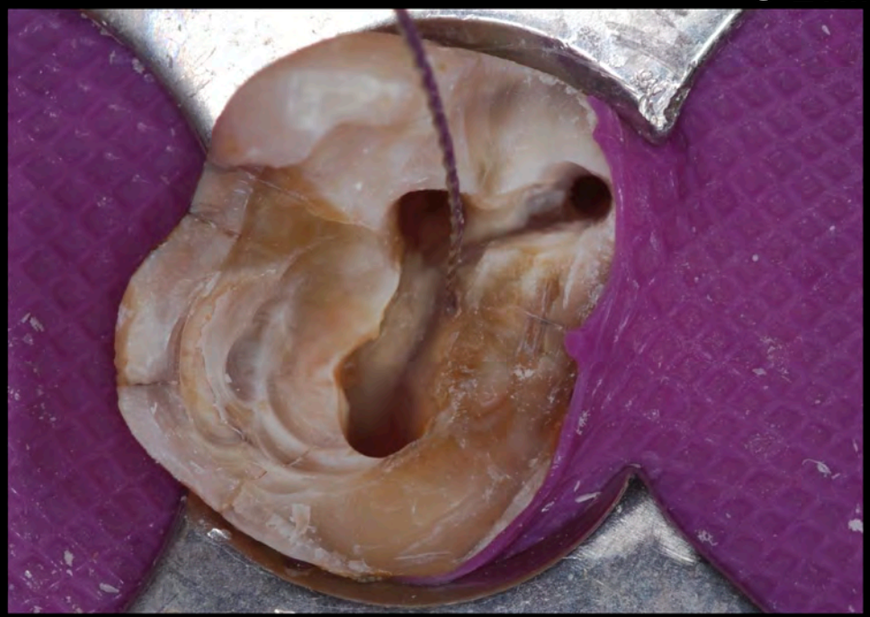
Following obturation 45 was restored using a hybrid composite, while time did not permit restoration of 46 a small amalgam was condensed into the canals to provide a seal. Radiograph taken on 3/9/10 show adequate RCT's. On 6/9/10 amalgam build up was completed

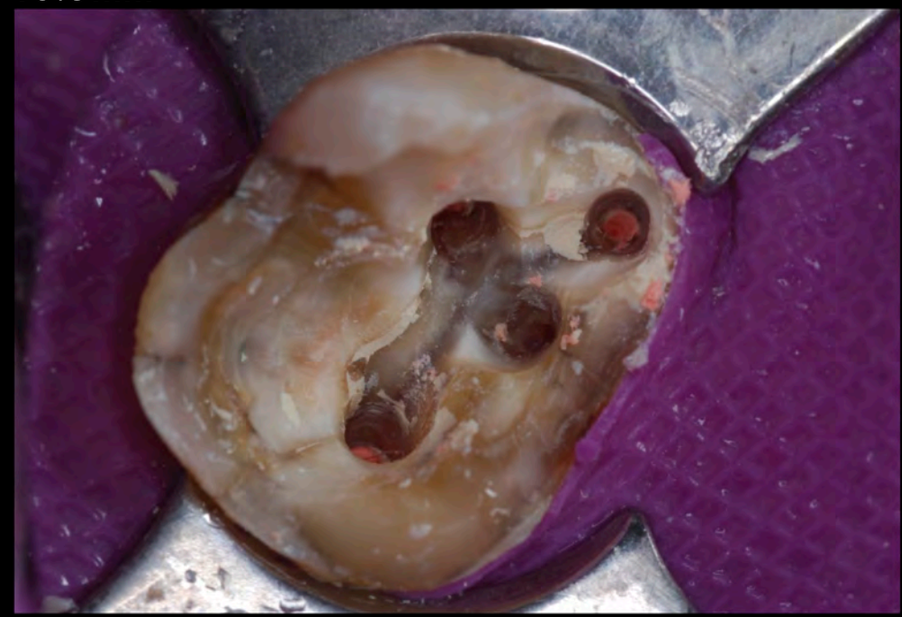
Subsequent radiographs taken on 15/3/11 (top right) and 20/10/11 (bottom left) show resolution fo the apical pathology with bony infill. Unfortunatley the same radioghraphs also show a possible deterioration of the bony levels and some subgingival calculus. 46 in particular would greatly benefit from a crown, indeed the amalgam restoration should have had full occlusal coverage.

Root Treatment and Restoration of 17

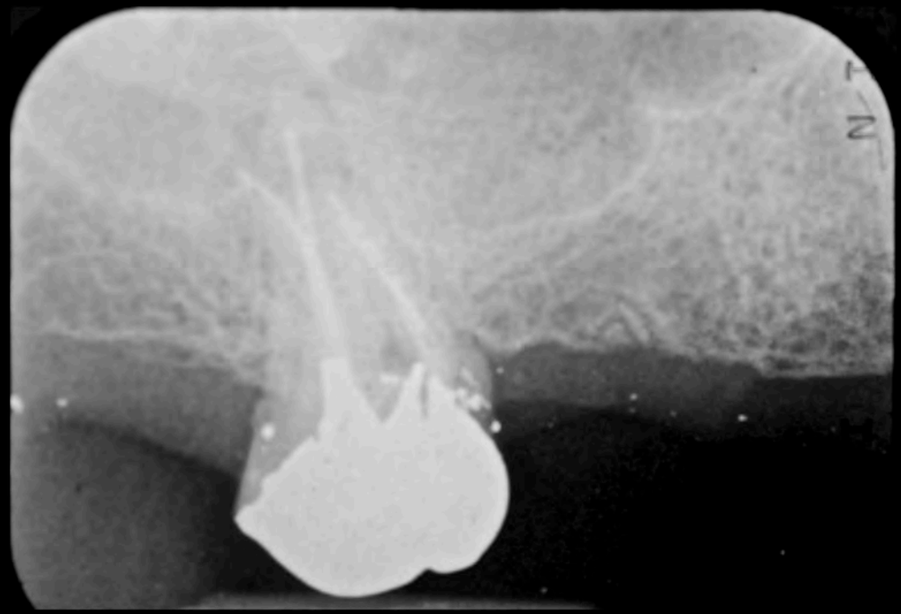


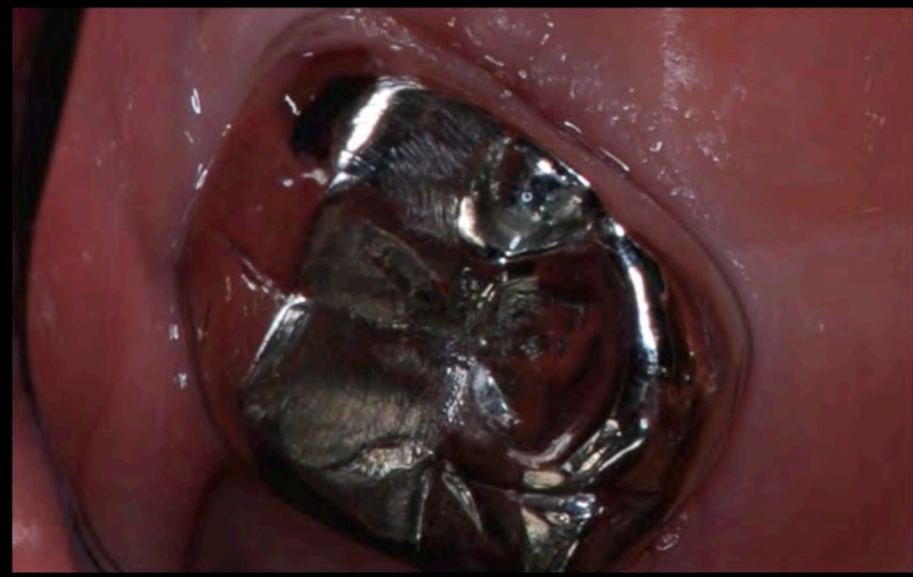
Existing restoration was removed revealing numerous cracks extending into dentine. WL of MB1, DB, and P canals were established with apex locator and verified with a radiograph. MB1 MAF 40 @ 20.5mm DB MAF 40 @ 21mm P MAF 55 @ 16.5mm



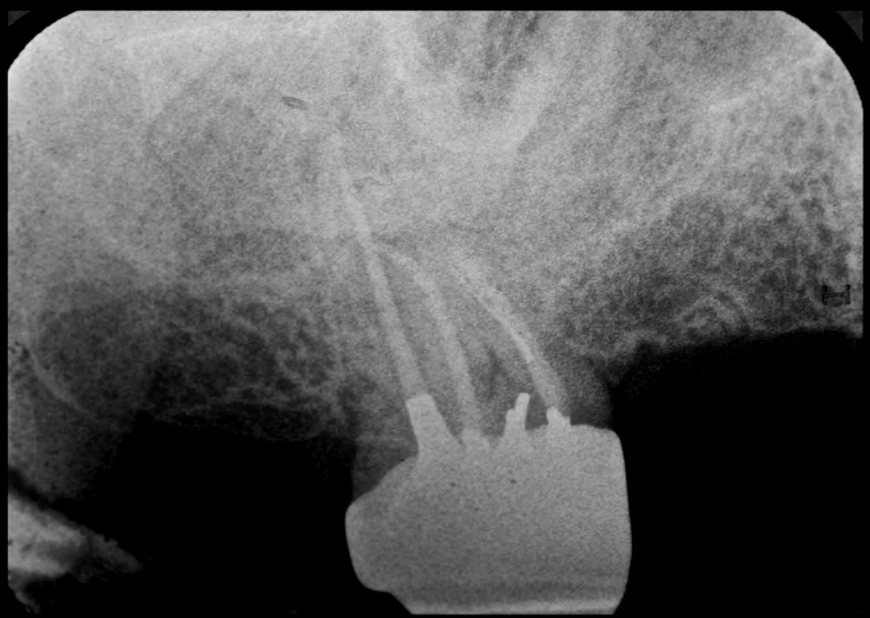


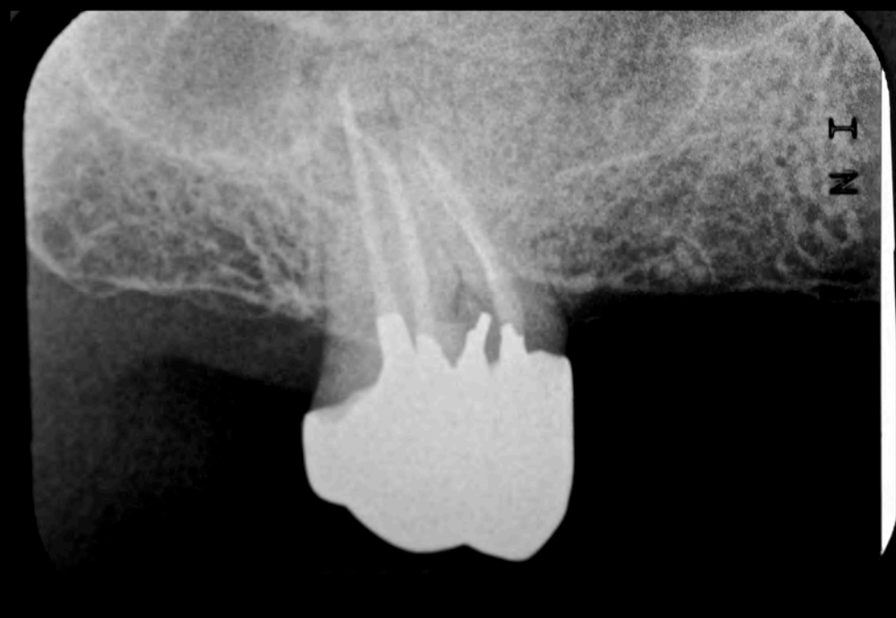
Following this MB2 was identified and WL established @ 16 mm. Unfortunatley the size 20 flexofile # at the WL. Removal of the # portion was attempted using a size 10 flexofile to bypass the # file, unsuprisingly given the canal angulation and diameter this proved unsuccessful. Given that we had been able to flare coronally with a S2 protaper and reduce the bacterial load consideraby, the decision was made to obturate via cold lateral cond





17 was provisionally restored with a nyyar amalgam core. Check radiograph taken on 6/9/10 shows # instrument in MB2 and RF in P canal may be 1-2 mm short. This tooth was restored with a full metal crown (non precious metal) cemented with zinc phosphate, a mesial rest seat and guide plane were incorporated. Occlusal adjustment was required.



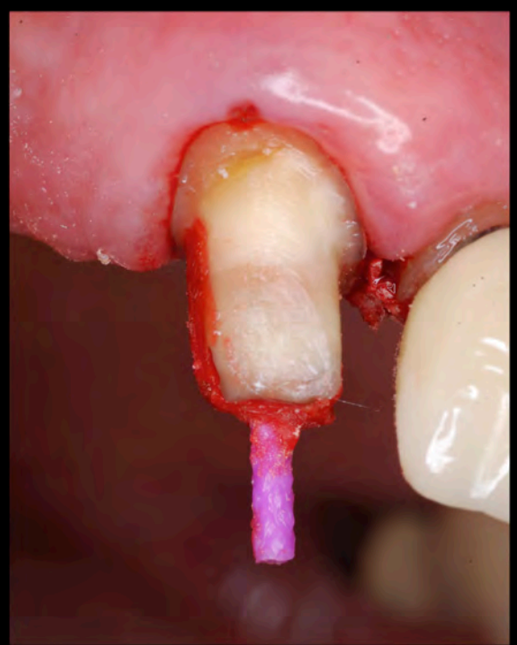
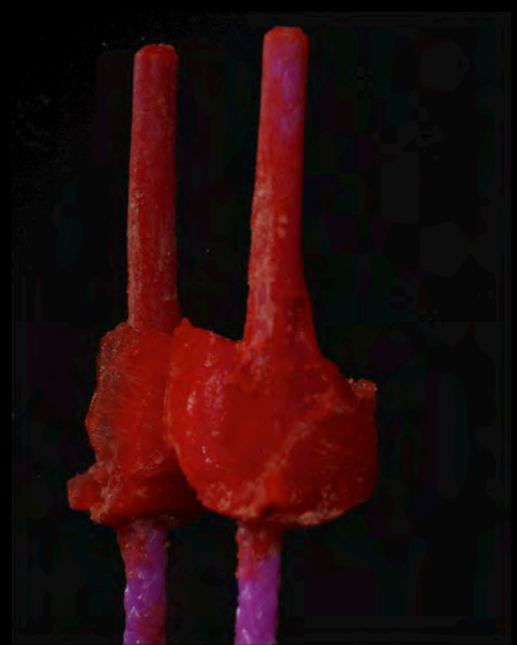


Fortunatley subsequent radiographs taken on 15/3/11 and 28/10/11 show reduction in the size of the peri-apical lesion. They do however show that the obturation above the # instrument was not great. In retrospect referral to a specialist endodontist when the instrument # would have been the best course of action.

Re-Root Treatment and Restoration of 13



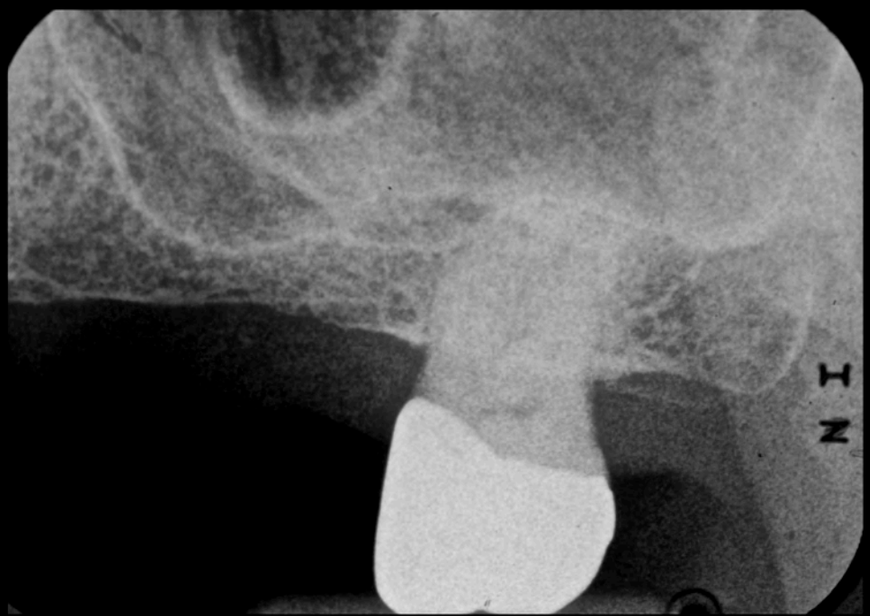
13 had the old gutta percha removed, the apex locator was not giving a consistent reading so the WL was detremined radiographically, canal was worked to MAF 50 @ 21 mm and obturated via cold lateral condensation, 13 was then prepared for a duralay cast post. The post RCT radiograph has been misplaced.

13 was temporised with cavit and the cast post was inserted (zinc phosphate) 4 days later and a provisional restoration constructed. The final PBMCr shade 2R2.5 non-precious (ni free) with metal palatal backing,distal rest seat, guide plane, and canine guidance was cemented with zinc phosphate in conjunction with the other crowns.

Restoration of 27

27 was retaining a 4 unit bridge, there was a NWSI on the DL cusp. The bridge was removed without LA and vitality was verified and lack of caries confirmed. A provisional bridge was constructed untill the next appointment at which the tooth was prepared for full metal crown.



Non-precios metal (Ni-free) was chosen for cost reasons, gold would have been a better choice. A mesial rest seat and guide plane were incorporated into the design however due to a restricted vertical height I was unable to eliminate the NWSI

Restoration of 24

24 was a retainer for a four unit bridge however the bridge had decemented on this tooth, originally it was intended to construct a PBMCr on this tooth however when the bridge was removed there was very little coronal dentine left. RCT was attempted however I was unable to locate the canal.

While crown lengthening could have been considered - given the short root and likely pressures as an RPD abutment the decision was made to place an occlusal amalgam and use as an overdenture abutment and xla if it became symptomatic.

Denture Design

Given that Mr S did not want to touch the anterior bridge it was necessary to conform the denture to the existing occlusion. Given that we are going to restore a kennedy class III mod I situation, a metal framework was the preferred option. Also given that at least 3 of the abutment teeth were going to require some form of indirect restoration it was decided to incorporate features into these restorations to aid denture retention.

Unfortunatley it became apparent that 24 was not suitable for a coranal restoration and was changed to an overdenture abutment. This meant that 23 (already a retainer for the anterior bridge) became an abutment.

Metal crowns were constructed on 17,27 and PBMCr on 13 incorporating appropriate rest seats, guide planes and contours for clasping for the final denture. The lab was sent a copy of the final denture design to aid their construction. (see appendix) Also at this stage it was decided to construct an acrylic denture as a short term measure while the final denture was being constructed.

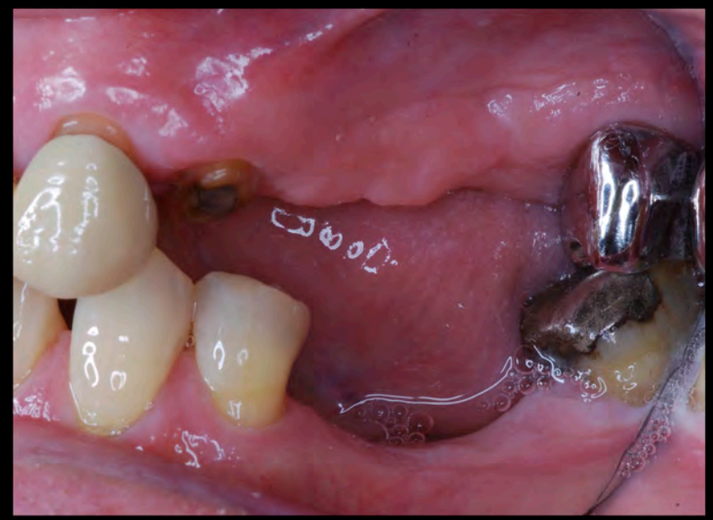
The acrylic denture would also function as a spare denture should it become necessary.

It was decided to use titanium for the metal framework given its excellent strength to weight ratio and proven biocompatibility.

A rest seat was also prepared in the DP surface of 23, which unfortunately perforated the crown.

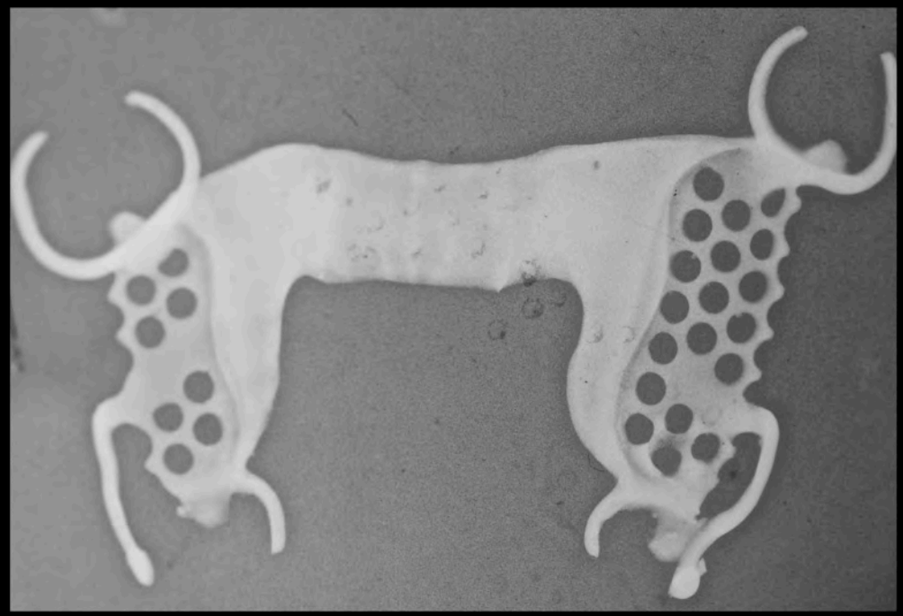
A mid-palatal strap design was chosen as this free's up the anterior hard palate and tends to be better tolerated by the patient

Situation prior to construction of denture

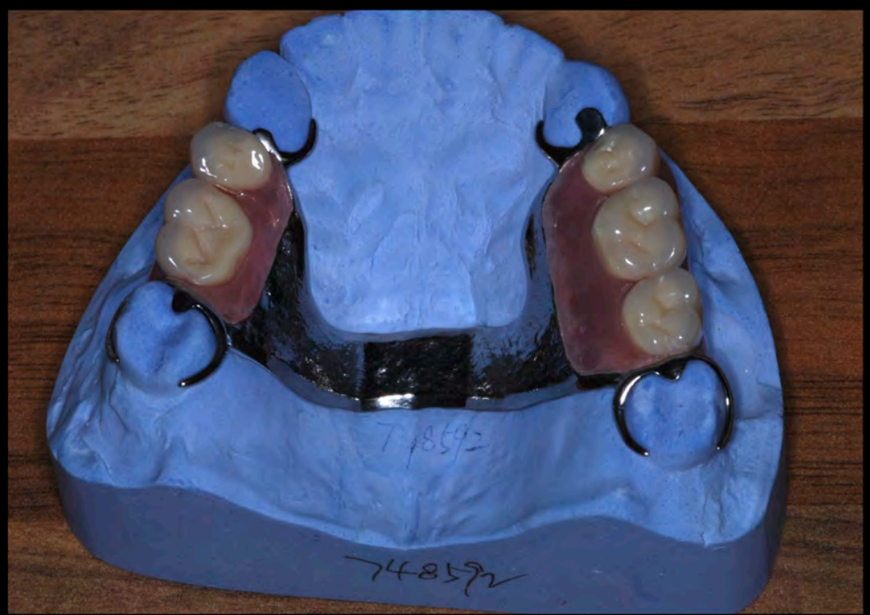


Acrylic denture was designed with the acrylic extending up to the gingival margins as this would facilitate the addition of the teeth of the anterior bridge in the case of failure. Tooth coloured clasps were incorporated.

Construction of denture



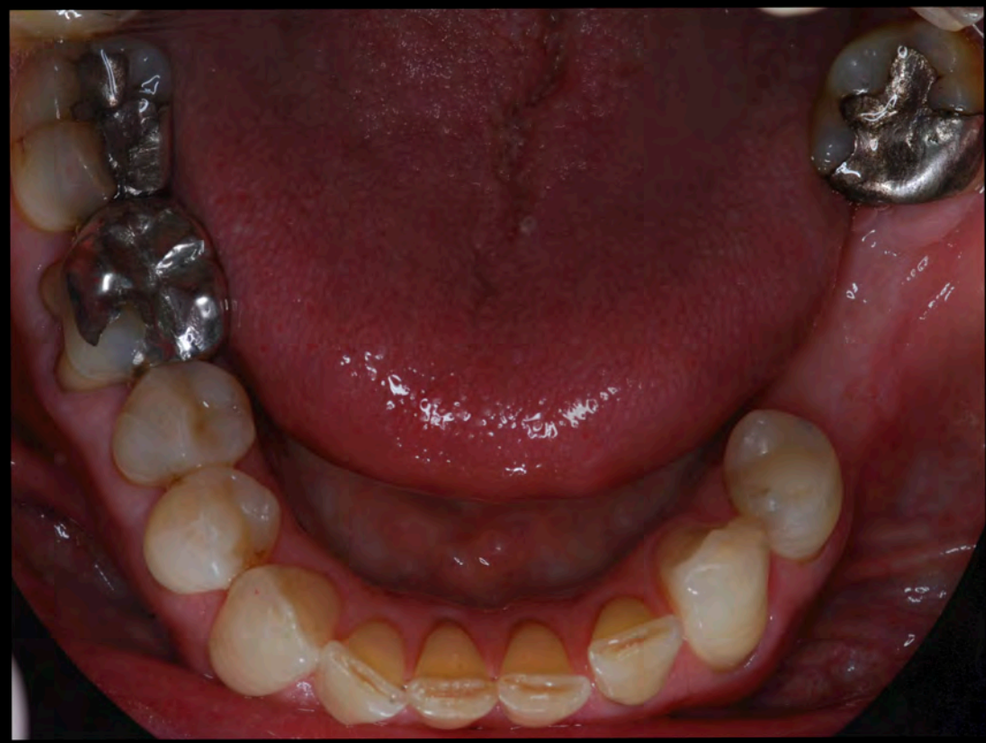
Master impressions were taken in a medium bodied addition cured silicone in a rigid special tray, the metal framework was tried in to verify fit and wax registration rims were incorporated onto the framework (as seen on a similar case above) and bite registration was carried out at the second appointment along with a facebow registration



Final denture at insert appointment, fit was excellent though occlusion was refined at insert appointment to ensure group function in lateral excursions thus reducing the loading on 13 and 23



Intra Oral Photos 22/5/12

Reflection

This was a difficult case, mostly because we were not able to follow an ideal treatment plan and had to work around the existing anterior bridge. As discussed earlier ideally this gentlemans upper arch would have been restored in RCP with implant supported bridgework and single unit crowns on the remaining teeth.

We have however I feel given this gentleman a reasonable medium term solution to his immediate issue of his failing bridge, a solution that he is more than happy with.

In conclusion, given the constraints placed on us, I feel that we have provided this gentleman with a fair intermediate solution on his journey to an upper full denture that is likley to be retained by ball end attachments on 13 and 23 and secured posteriorly by 17 and 27