Schottlander Oral Award Abstracts

Clinical Audit - Efficiency of an Occlusal Check Record

Rizwaan M Chaudhry

Bridge Street Dental, Driffield

Email: dr.r.m.chaudhary@hotmail.com

Background:

The purpose of this Audit was to evaluate the accuracy and efficiency of an occlusal check record. The idea of the occlusal check record was proposed in 1992 by Lyndon Cabot. It has been assumed that the check record is an accurate method of verifying the occlusion of complete dentures. Most complete denture construction within the UK is done using a plane line or simple hinge articulator (Patel *et al*., 2013). Thus, there is no consideration of lateral movement. These limitations are inherent in the technique (Patel *et al*., 2013). The check record can be modified to this method accepting the fact, although inaccuracies will be inevitable without a facebow, the resulting occlusion will be far better than using articulating paper in mouth (Cabot, 1992).

Method:

From a period of December (2020) to March (2021) – 77 complete dentures were provided. Out of the 77 dentures, 62 complained of post-op occlusion problems during their fit appointment. 48 of the 62 cases, occlusion was adjusted via chare side and articulating paper. The remaining 14, patients were told to persevere with new dentures. It was concluded that something needed to change.

Dentists were then brought together in a practice meeting where the data was highlighted. As such decision made to assess how this could be amended. A short video of occlusal check record was then recorded and shown to dentists. Between April and May 32 complete dentures which were provided were reassessed to examine if the occlusal check record proved beneficial.

Results:

A total of 14 dentists in a single practice agreed to take part in the audit. Results showed that 80% of the dentists found occlusal check record to be beneficial. 70% found it useful and all dentists stated that no patients complained during the review stage.

Discussion:

Occlusal errors cause more discomfort for denture wearers than any other factor (Breeding *et al*., 1994). The method employed to alleviate discomfort and ulceration caused by occlusion is to hack a piece out of the fitting surface of the denture. It is quick, and, under pressure, appears an attractive expedient (Cabot, 1992).

The main issue with occlusal check record is the time it takes. In an NHS setting time is very valuable, and the check record on average takes between 10-12 mins alone. Whereas the normal fit of denture appt with possible Intra-oral adjustment takes around 10 mins. The added 10-12 mins alone on an appt can affect the clinicians hitting their UDA targets, meaning affecting salaries, in an already tightly budgeted procedure.

Conclusion:

Accurate, well-made occlusal records can make a huge difference. Time spent reviewing the use of occlusal records will undoubtedly pay dividends when time comes to assess occlusion. Overall, results show that the occlusal check record is beneficial in identifying and eliminating occlusal errors. It identifies where the occlusal errors are and this leads to a more accurate removal of these errors i.e. removing from the fossae thereby retaining occlusal morphology and such maintaining centric occlusion.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Clinical Performance of CAD CAM Generated Nanofilled Hybrid Ceramic Onlays on Endodontically Treated Posterior Teeth

Noushad Rahim*, Shanon Patel, Federico Foschi, Francesco Mannocci, Rupert Austin

Kings College London

Email: drnoushad@hotmail.com

Objectives:

The current philosophy for restoring endodontically treated teeth (ETT) in the posterior region is cuspal coverage using full crowns. There is increasing evidence that preservation of tooth has resulted in a better prognosis for endodontically treated teeth. Onlays or overlays are a more conservative alternative to full crowns.

The primary aim of this study is to evaluate the clinical performance of nanofilled hybrid ceramic onlays on ETT, with restorations fabricated using the computer-aided design and computer-aided manufacturing (CAD CAM) system. There is very limited clinical data on success and survival of onlays on ETT as well as the CAD CAM generated restorations on ETT. The traditional material of choice for restoring ETT are ceramics or gold alloys. This study assesses the clinical performance of a nanofilled hybrid ceramic material (Cerasmart®) as an onlay in endodontically treated teeth.

The secondary aim is to assess the wear of these restorations after 1 year of clinical use and compare it to wear from a simulated chewing of 250,000 cycles (1 year of normal chewing use).

Materials and Methods:

Patients who attended the endodontic clinics at Guy's Hospital London, if eligible, were invited to take part in the study. On completion of the root canal treatment, following standardised protocols, the teeth were restored using CAD CAM generated onlays or crowns. A total of 150 restorations (Onlay, crown or direct composite resin) were placed on 127 patients. Onlays were provided for 116 teeth and 85 were available for the recall after 1 year. Two calibrated operators evaluated the restoration using the modified USPHS as well as the FDI criteria. Survival of restoration was determined using the Kaplan- Meier survival curves.

Results:

The restorations were followed from 2018 to 2022. There were a total of 13 failures over the 4-year period. Two had to be extracted due to fracture of restoration and tooth. These two cases had been restored using full crowns. Eleven restorations chipped or fractured and were considered as relative failures. Of these 11 failures, 2 were repaired using direct composite resin and 9 were replaced. There was very minimal wear, on both enamel and the hybrid ceramic.

Conclusions:

Onlays provide an acceptable alternative to the full crowns in restoring the ETT. The most common failure was the fracture of the restoration. Onlays afforded another opportunity to save the tooth by replacing the restoration or restoring it using a full crown. Long term follow up is required to obtain more relevant clinical data of these restorative materials and restoration on ETT.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

The Analysis and Comparison of Passive Fit Between Laser- Sintered Screw Retained Cobalt Chromium Full Arch Implant Retained Bridges and Their Milled Counterparts

Peiman Yazdani*, Stefano Del Monte, Shakeel Shahdad

Royal London Hospital. Queen Mary University of London.

Email: peimanyazdani@gmail.com

Aims and Objectives:

To evaluate the accuracy of marginal fit of the laser sintered screw retained full arch implant prosthesis on 4 implants, compared to the prosthesis fabricated with milling machines.

Null hypothesis:

There is no difference in marginal fit accuracy between the screw retained full arch implant bridge fabricated with laser sintering technique and their counterpart fabricated with milling technique.

Clinical significance:

The laser sintered manufactured prosthesis are less costly compared to their milled counterparts and can be produced with much higher speed with less waste of material.

Results:

It was found that the average difference between the fully-tightened and the Sheffield test group gaps (i.e. passive fit) was 47.21 and 52.35 microns for laser-sintered and milled groups respectively. An independent sample two tailed t-test revealed a non-significant difference between the passive fit of the milled and laser sintered prostheses (p=0.53).

Conclusion:

Within the limitations of this study it was found that laser sintered and milled implant prostheses presented comparable marginal fit. Therefore the use of laser sintered implant retained prostheses in practice is recommended.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Schottlander Poster Award Abstracts

Ball or OT Equator Attachments

Ahmed Mohamed Amr Abdelmoez Abosabaa*, Mohammed M Fouad, Elsayed Abdallah Abdel-Khalek

Faculty of Dentistry, Mansoura University, Mansoura, Egypt

Email: Ahmed.abosabaa@ulh.nhs.uk

Objectives:

This clinical comparison study compared between different designs of solitary attachments used to retain implant assisted mandibular distal extension RPD regarding alveolar bone height changes around abutment teeth.

Methods:

Twelve patients with mandibular Kennedy Class I were selected for this study. The remaining natural teeth were extended from the first premolar on one side to first premolar on the other side. one implant was placed in each first molar region bilaterally. The removable partial dentures were retained anteriorly by RPA clasp design and posteriorly either by ball attachment (group I) or by OT-equator attachment (group II). Alveolar bone height changes around the primary tooth abutments were radiographically evaluated using cone beam volumetric CT.

Results:

Regarding bone loss around the primary abutment teeth, Ball attachment group (0.72 ± 0.15) significantly (p value = 0.008) showed less crestal bone resorption when compared to OT-equator attachment group (1.01 ± 0.25).

Conclusion:

Within the limitation of this study and regarding the preservation of abutment teeth, the use of ball attachment may be the suitable choice for anchoring distally extended removable partial denture to dental implants with improved longevity of the natural tooth abutments.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Pontic Site Development: Achieving an Aesthetic Outcome for Bridgework

Catherine Black*, Peiman Yazdani

Barts Health NHS Trust

Email: catherine.black@nhs.net

Aims and Objectives:

Restoring a patient's smile is incredibly rewarding. However, when in the aesthetic zone, this can be an arduous task where creation of a natural replica requires a fastidious approach. This poster will outline the types of pontic design focusing on the ovate pontic, cases in which pontic site development would prove beneficial and the soft tissue management techniques to create a predictable result with optimal aesthetics.

A commonly used type of pontic used is the modified ridge lap pontic which provides reasonable aesthetics and facilitates hygiene compared to the conventional ridge lap pontic, however the emergence profile can be less than ideal which poses an issue in the anterior maxilla. In such cases, ovate pontics may be considered. The soft tissues require sculpting prior to placement of a definitive restoration, creating the appearance of the pontic emerging from the gingiva in attempt to recreate nature as close as possible. The sculpturing aids in the production of an interdental papilla which is supported, therefore reducing the appearance of black triangles.

Case Selection:

Typically, these cases would include patients with single tooth loss for example from trauma or hypodontia particularly in the anterior maxilla and usually if there is a high smile line or the patient's aesthetic demands are high. For the ovate pontic to be successful, certain clinical ideals should be met including sufficient height and width of alveolar ridge to allow soft tissue modification.

Discussion:

Development of the pontic site can be done using direct or indirect techniques. Indirect modification involves relieving the master cast in the lab and the soft tissues adjusted at fit, however this can lead to unpredictable results. Direct modification allows the clinician to gain more control over the emergence profile through chairside gingivoplasty. This can be carried out using a fast handpiece and oval-shaped bur or electrosurgery to carve soft tissues prior to taking impressions, however these techniques can be quite invasive.

The cases which will be discussed use less invasive direct techniques to modify the soft tissues by adaptation of the provisional pontic in the form of an Essix and Hawley Retainer. This can also be applied to other cases such as removable partial dentures and implant-retained provisional prosthesis. The use of composite provides a more accessible and familiar material for the clinician to work with over historically used autopolymerised resin. This can be shaped in such a way that applies constant pressure on soft tissues to achieve gingival recontouring and tissue remodelling in a gradual manner until the ideal gingival topography is created.

The technique is simple to use and is readily applied to practice setting to create a highly aesthetic and natural looking tooth replacement.

References:

Gahan MJ, Nixon PJ, Robinson S, Chan MF. The ovate pontic for fixed bridgework. *Dent Update*. 2012 Jul-Aug;**39**(6):407-8, 410-2, 415. doi: 10.12968/denu.2012.39.6.407. PMID: 22928453.

Alani, A., Corson, M. Soft tissue manipulation for single implant restorations. *Br Dent J* **211**, 411–416 (2011). https://doi.org/10.1038/sj.bdj.2011.904

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

A Review of Head and Neck Cancer Trends in Northern Ireland: 1993-2019

Beth Bradley*, Deidre Flanagan, Conor McKenna, Anna Gavin, Mark Lawler, Gerry McKenna

Queens University, Center of Dentistry

Email: beth.bradley@qub.ac.uk

Background:

Head and Neck Cancers change in incidence based on anatomic location and demographics, some of which has been reported in Northern Ireland (N.I.). This study aims to investigate recent Northern Ireland Cancer Registry (NICR) data between 1993 and 2019 to present the incidence burden of the disease highlighting trends by anatomic location and demographic factors.

Study Design:

Retrospective database analysis

Methodology:

A retrospective study of 7246 patients diagnosed with Head and Neck cancer between 1993 and 2019 inclusive were reviewed from the Northern Ireland Cancer Registry. The ICD10 coding system was used in conjunction with the head and neck site definitions as detailed in the AJCC cancer staging manual.

Results:

7246 cases of Head and Neck cancer were diagnosed in N.I. from 1993-2019 representing an average of 279 per year with squamous cell carcinoma (SCC) with n=5985 (83%) the most common morphology. The number of cases increase steadily each year with; 247 in 1993 and 385 in 2019. The three most common anatomical sites (n=5325, 73%) were: oropharynx (n=1400, 26%), oral cavity (n=1943, 36%) and larynx (n=1982, 37%). All cancers were more common in males (n=5061, 70%) than females (n=2185, 30%) with a mean age of males 64.1 and females 65.6. There was a marked association with deprivation, with 1953 (27%) from most deprived compared to 1114 (13%) from the least deprived quintile. Not only were those in lower deprivation quintile most at risk of developing head and neck cancer but they were also most at risk of death following head and neck cancer diagnosis.

Conclusion:

This nationally representative data set illustrates that large numbers of patients in Northern Ireland are diagnosed with Head and Neck Cancer each year. The majority of cases present in older males with SCC the most common presentation. There is a worryingly high proportion of stage IV, Head and Neck Cancer presentations and the associated deaths highlights the need for better public information, education and access to oral heath care. Head and Neck Cancer presentation in Northern Ireland is strongly associated with deprivation status.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Improving Communication Via theImplementation of an Implant Passport and Protocol

H Bradley*, S Rollings

Aberdeen Dental Hospital

Email: hbradley75@gmail.com

Background:

In 2019 The Royal College of Surgeons of England (RCSEng) and Restorative Dentistry-UK (RD-UK) published 'Guidance on the standards of care for NHS-funded dental implant treatment'. This updated the previous 2012 guidelines with the aims of establishing clear standards and promoting clinical excellence for NHS care. The guidance includes standards regarding the information that should be documented and provided to both the patient and the General Dental Practitioner (GDP) upon completion of NHS dental implant treatment. We designed a departmental implant passport and associated protocol to enable us to conform with the updated guidance.

Aims and objectives:

The aim was to assess and standardise the communication with patients and their GDP following completion of dental implant treatment as recommended by RCSEng and RD-UK guidance. The objectives were to measure current compliance with the guidance and implement an implant passport and protocol for all patients who receive dental implant treatment within the department.

Methods:

A retrospective analysis was performed of 50 discharge letters and clinical records of NHS dental implant patients who were discharged from the department between March 2018 and November 2020. The gold standards regarding information communicated with the patient and GDP were derived from the RCSEng and RD-UK guidance. Fourteen criteria were identified and the standard set that '100% of patients who are discharged following completion of dental implant treatment should have a discharge letter which includes information regarding all 14 criteria listed in the RCSEng and RD-UK guidance'. The collated data was analysed and presented at a departmental meeting and an implant passport and associated communication protocol was developed to enable all fourteen criteria to be satisfied.

Results:

Cycle one revealed a significant shortfall compared to the gold standards. While 96% of patients had a discharge letter sent to their GDP, no patients received written information regarding their dental implant treatment. Only 4 of the 14 criteria achieved a compliance above 50% and the average compliance with the guidance across all patients was 37% with a range of 0-100% demonstrating a low compliance with significant variation. The implant passport and protocol have been implemented and a second cycle of data collection is underway to assess their impact and whether or not the gold standards have been met.

Conclusion:

Analysis of the first cycle of data revealed poor compliance regarding communication with patients and GDPs when compared to the 14 standards identified in the RCSEng and RD-UK guidance when discharging NHS dental implant patients from the department. The implementation of an implant passport and protocol should dramatically improve this and result in improved consistency between clinicians, departmental efficiency and ultimately communication with our patients and GDP colleagues. This should improve the ability of patients to receive long-term maintenance of their dental implants in primary care.

References:

Royal College of Surgeons of England and Restorative Dentistry-UK (2019). Guidance on the standards of care for NHS-funded dental implant treatment. Available from: https://www.rcseng.ac.uk/-/media/files/rcs/fds/publications/implant-guidelines.pdf

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Prosthodontic Rehabilitation of a Head and Neck Cancer Patient with Extreme Trismus

Garima Charan*, Krupti Denhard

Eastman Dental Hospital, University College London Hospitals NHS Trust

Email: garimacharan@me.com

Introduction:

Head and neck cancer is the fifth most common cancer worldwide, and the treatment journey can have devastating impact on the function and psychological wellbeing of patients. Successful oral rehabilitation has shown to have significant influence on the quality-of-life post-oncology treatment. However, there are number of patient and clinical factors that present prosthodontic challenges in restoring function and aesthetics.

Case Description:

The case presents a 59-year-old woman with a previous history of adenoid cystic carcinoma, that was treated with chemo-radiotherapy and partial maxillectomy. She was referred for replacement of her failing maxillary obturator worn for the last 5 years, which she now finds very difficult to insert due to her limited opening, from radiotherapy-related trismus. She also informed that the obturator has become increasingly loose and that she now experiences escape of oral-nasal fluids. The case was managed through careful design and planning of the denture stages, to facilitate the impression of the maxillopharyngeal defect and palate and jaw registration, including a designed two-part tray and modified occlusal rim plate. A final cobalt chrome maxillary obturator with hollow bulb was fabricated, with a specific insertion technique to allow for successful wear, comfort and function.

Discussion:

Oral rehabilitation of cases with large oranasal defects can present with prosthodontic challenges, which in this case was exacerbated by the patient's extreme trismus. The classic denture principles were applied, with adaptation of the treatment stages and denture design to the patient's clinical presentation for successful management. This case was a gentle reminder that each head and neck cancer case is unique and as specialists we continue to learn and innovate, as we play a crucial role in the multidisciplinary management and long-term rehabilitation of these patients.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Partial Printed Denture with Custom Composite Teeth

Rizwaan M Chaudhry

Bridge Street Dental, Driffield

Email: dr.r.m.chaudhary@hotmail.com

Background:

The following case is a first within the United Kingdom involving an upper partial denture, which was printed in denture resin rather than milled. A new technique termed "Cut-Back" developed in partnership with Mango Dental Laboratory was used to characterize the denture teeth.

Cut back technique is where the denture is printed in full, and then carefully cut by hand, creating space to add characteristics but not compromising functionality or aesthetics.

Case:

A 57-year-old female presented with a poorly fitting upper denture. Pt complained of denture continuously breaking due to her bite (class II - Div I), being loose and difficult to eat with along her primary concern being poor aesthetic.

Pre-Operative photographs were taken and sent to Mango Laboratory. Due to the patient wanting naturally looking dentures which included natural staining, the lab and I decided to use cut-back technique.

Discussion:

The composite cut-back technique was created to ensure natural aesthetics in removable prosthesis can be achieved whilst remaining uncompromised in function. Cutting-back ensures that no post-op modifications are required. Rather than relying on standard moulds of teeth which require modifying at chairside, this method allows all aesthetic considerations to be built in.

This case demonstrates the use of cut-back technique as a new innovative way to meet patient desires.

The denture itself was designed using 3Shape denture design studio using pre-operative photographs. The denture was then printed using Formlab's form3BL in a biocompatible photopolymer resin known as denture base/teeth resin.

Conclusion:

The results on this case showed that the technique is favorable. Patient satisfaction was extremely high. The final denture incorporated the patients bite, meaning no occlusal changes were necessary. Functionality was achieved, while aesthetics not compromised.

The technique allows one to add layers on teeth, such as dentine, enamel and staining thus ensuring natural smile and look is achieved.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Management of Patients with Acrylic Denture Base Allergy: A Case Series

A Duke*, C Cunningham and D Barker

Aberdeen Dental Institute

Email: alice.duke2@nhs.scot

Introduction:

Denture base resins are classified depending on the factor which initiates the polymerisation reaction involved in the curing process: chemical, heat, light or microwave. Acrylic resin is used in the fabrication of implant-supported, conventional fixed and removable partial dentures. Composition of acrylic denture base includes a powder, containing a polymer, initiator and pigments, and a liquid, containing monomer, cross-linking agents, inhibitor and activator.

Background:

There are reports of the allergic effects of denture base materials within the literature. This is commonly due to the harmful effects of denture base biodegradation to the oral environment. Unreacted monomer leaching into the oral cavity can cause allergic reaction and damage to oral mucosa at a cellular level. Patch testing has proven to be a reliable method of detecting such potential reactions in patients who present with signs and symptoms of allergy.

Case Series:

The purpose of this case series is to outline the cytotoxic consequences of denture base acrylic resins and discuss the alternative materials for use. Three patients were referred to Aberdeen Dental Institute presenting with erythematic blistering and rash over the denture bearing area. Symptoms were reported following fit of prosthesis in primary care. Due to complex medical histories, a considered management strategy for each patient was required to provide a functional well-tolerated prosthesis. This involved a multidisciplinary approach to exclude potentially contributory medical factors through haematological screening. In each case, liaison with Dermatology was required to carry out targeted patch testing to identify allergy to the following specific denture base material components: methyl methacrylate, HEMA, nickel sulphate, cobalt chloride, myroxylan pereirae, benzoyl peroxide and benzoic acid.

Patient A exhibited allergy to benzoyl peroxide. Patient B exhibited allergy to methyl methacrylate, HEMA, nickel sulphate, cobalt chloride and myroxylon pereirae. Patient C exhibited allergy to benzoyl peroxide and benzoic acid. In each case, alternative materials to acrylic denture base were sourced to enable construction of a safe and functional prosthesis. Patient's A and C were provided with a prosthesis fabricated from polyamide, manufactured without chemical initiator by bredent UK Ltd. Patient B was provided with a partial thermoplastic Valoplast® prosthesis.

Conclusion:

Any patient presenting with reported allergic reaction or chemical irritation to an acrylic prosthesis must be managed appropriately to exclude the possibility of symptoms caused by denture base materials. Clinician awareness of the components of acrylic denture base is vital to ensuring correct patient management and provision of prosthesis utilising alternative materials to acrylic denture base.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Initial Prosthodontic Management after Poly Facial Trauma

James Julian Eaton

Bristol Dental Hospital

Email: james.eaton@uhbw.nhs.uk

A 32-year-old male was referred by the Oral and maxillofacial (OMFS) team to a secondary restorative care department for assessment and prosthodontic management. The patient had been involved in a collision with a lorry as a pedestrian 10 months ago and had suffered multiple traumatic injuries. Orofacial injuries included a severely communicated fracture of the mandibular symphysis, bilateral displaced condylar head fractures, Le Fort II fracture of the maxilla and left zygomatic complex fracture. Dental injuries included avulsion of a retained URC, UR7-UR5 and LR5-LL4. Additional limb injuries included a left open knee dislocation and right ankle fracture.

Maxillary and mandibular fractures were initially managed with ORIF with miniplates and intermaxillary fixation while the condylar fractures were managed conservatively. Several plates subsequently became infected and were later removed.

At restorative consultation, the patient had two main complaints; poor aesthetics due to the space left by the avulsed teeth and secondly, difficulty brushing on the lower right due to chipped teeth. Apart from the injuries, he was medically fit and well and enjoyed an active lifestyle of motocross and landscape gardening.

Extraoral examination revealed a healed fibrotic tracheotomy site and healed soft tissue lacerations to the forehead. All cranial nerves were intact, and the patient reported normal sensation to the lower lip. Intra orally, all the soft tissues were healthy with healed sulcular incisions secondary to surgery. There were several uncomplicated enamel-dentine fractures of both upper and lower anterior and posterior teeth, dentine hypersensitivity was associated with the fractured LR6. Periodontally, there was plaque induced gingivitis with marginal calculus build up.

The patient was diagnosed with a Kennedy Class I modification in the maxilla, with a bone type of Atwood class 5. In the mandible, a Kennedy class IV saddle was present with bone type of Atwood class 6.

The initial treatment plan devised involved stabilisation of gingival health with enhanced oral hygiene instructions and preventative advice with supragingival PMPR. The fractured teeth were restored with composite restorations conforming to the current occlusion while the edentulous spaces were restored with removable cobalt chrome dentures.

Following this stabilisation, the patient may go on to receive bone grafts to the anterior mandible to facilitate subsequent dental implant retained restorations. The prostheses made during initial stabilisation will help guide subsequent dental implant planning with respect to tooth positioning as well as providing hard and soft tissue replacement to improve function and aesthetics in a short time frame.

This case report highlights the crucial role of traditional prosthodontic management for complex cases to restore a patient's function and confidence with an interim prosthesis, while planning and funding is sought for further complex restorative options. In addition, by looking at the patient holistically, a stable oral background has been provided in order to achieve the best possible treatment outcomes for the future.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Enhancing Aesthetic Outcomes with Modern Materials and Techniques

Samira Ezzati-Nik

Eastman Dental Institute

Email: samira.ezzati@gmail.com

The case is a young hypodontia patient who presented for the restoration of his missing dentition following the completion of orthodontic treatment at the Eastman Dental Hospital.

Patient complaint:

A 21-year-old male patient was seen at the department of prosthodontics at the Eastman Dental Hospital complaining of aesthetic concerns regarding the spaces between his upper front teeth and in the upper and lower posterior segments.

History:

Initially referred to the Hospital by his GDP for hypodontia. Orthodontic treatment completed by the department of orthodontics to idealise the spaces of the missing dentition for prosthetic replacement. Post-orthodontic fixed retainer provided on the UR2-UL3 as well as Essix retainers. Referred to prosthodontics for the restoration of the edentulous spaces. The patient would only accept a fixed option for the replacement of the missing teeth.

Relevant clinical findings: The patient presented with:

Six missing teeth, namely the UR45, UL45, LR5 and LL5. Microdont UR23 and UL23 with mild interdental spacing and the upper canines were also conical in shape. Sufficient interdental space to accommodate adequate size UR45, UL45, LR5, LL5. UR6 and UL6 were out of contact in ICP bilaterally. Lateral guidance was controlled by the wisdom teeth bilaterally and protrusive movements were guided by UR1 and UL1 against LR12 and LL12.

Diagnoses:

Severe hypodontia

Class III incisor relationship

Treatment options

Missing teeth:

Although accepting the spaces with no intervention and removable partial dentures for replacing the missing teeth were possible options, they were not considered as viable in this patient given his age and his strong preference for a replacement of the missing teeth with a fixed solution.

Alternative options included:

Dental implants

Bridges

2i) Resin retained (RRB)

2ii) Conventional

The pros/cons/risks/benefits of all options were discussed with the patient. His first choice was dental implants, however, the CBCT scan showed insufficient bone for placement of implants in the maxillary spaces but adequate bone in the mandibular spaces. On further discussion with the patient, he decided to proceed with dental implants to replace the LR5 and LL5 and RRBs to replace the UR45 and UL45.

Anterior spacing:

The patient was given the option of recontouring his upper anterior teeth to correct the microdont shapes and mild spacing, which he was keen to have. Following a diagnostic wax-up and mock try-in this was subsequently confirmed.

Material options for RRBs:

Metal-ceramic

Full ceramic (Zirconia)

Treatment completed and outcome:

Composite build-ups UR12, UL12 via the injection moulding technique from a diagnostic wax-up.

Zirconia (3Y-TZP) RRBs: Two distal cantilever RRBs were placed with full coverage (crown) retainers on the UR3 and UL3, replacing the UR4 and UL4. Minimal tooth preparation was required for this. Two mesially cantilevered RRBs with occluso-palatal retainers on the UR6 and UL6 were placed to replace the UR5 and UL5. Sufficient interocclusal space was available to accommodate the retainers without the need for tooth reduction.

Dental implants in the LR5 and LL5

Post-operative Essix retainers

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Dental Toxicities Following Paediatric Head and Neck Proton Beam Therapy - Are we Prepared for the Potential Challenges?

Emma Foster-Thomas*, Craig Barclay, Marianne Aznar, Peter Sitch, Ed Smith, Keith Horner, Simona Gaito

University Dental Hospital of Manchester

Email: emma.foster3@mft.nhs.uk

Aim:

To present the dental toxicities identified in a 11.5-year-old female treated with proton beam therapy (PBT) aged 3.5 years for head and neck (H&N) cancer.

Background:

It is known that radiation therapy is an independent risk factor for adverse sequelae to the oral cavity and dentition in childhood cancer survivors. However, dental toxicities after radiotherapy are often underreported and there is very limited published data on disturbances in tooth development. It is known from the literature on conventional photon radiotherapy that the nature and severity of dental disturbances is inversely related to the patient's age and stage of tooth development at the time of radiation. It is the hope that the incidence and severity of dental toxicities with PBT may be reduced, however, the lack of prospectively data makes it challenging to identify dosimetric thresholds in children.

Method:

A retrospective service evaluation was conducted at The Christie NHS Foundation Trust to evaluate the documented assessment of dental development disturbances following PBT in paediatric H&N cancer patients referred overseas for PBT. 195 UK paediatric patients were treated with PBT for H&N in the Proton Overseas Programme. Of these patients, dental developmental disorders were recorded in 4. The clinical and radiographic findings for one of these patients are presented.

Case:

A 3.5-year-old female diagnosed with embryonal rhabdomyosarcoma of the nasopharynx (T2aN0M0) in 2013 was treated with IVADo chemotherapy in Manchester followed by PBT in Jacksonville (USA). Dental development disturbances were first recorded 3.5 years following treatment completion where the patient complained of discomfort associated with the hypomineralised maxillary first permanent molars. With >8 years of follow-up to date, radiographically the following abnormalities have been identified: failure of development UR7, UL7 and LL5; microdontia UR5, UL5, LL7, LR5 and LR7; multiple teeth showing hypoplastic roots (upper anterior teeth) or arrested root development (UR6, UL6 and LL6). To determine the radiation dose to the maxilla and mandible, these structures were manually contoured (mean doses - 30Gy maxilla, 25.85Gy mandible). This dosimetric data was then reviewed in relation to dental sextants to determine the minimum tooth threshold in this patent.

Discussion:

The minimum toxic dose to a developing tooth remains unknown, however the dose to teeth should be kept as low as possible in younger patients, With the poor prognosis of this patient's maxillary dentition, the restorative dental team will face multiple challenges. The question of when to treat and how to manage this patient short and long-term remains. Will the option of a conventional removable prosthesis be this patient's only option?

Future research aims:

To develop a prospective tool for reporting of dental toxicities in paediatric H&N cancer patients treated with PBT in the UK and overseas. To use this long-term data to extract dosimetric data to determine the impact of age and dose on the risk of dental disturbances. The hope is that this knowledge will allow oncologists to restrict the dose to developing jaws, thus reducing the risk of toxicity, and consequently improving dental outcomes.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Revisiting the Significance of Primary Stability in the Successful Osseointegration of Non-Immediate Loaded Dental Implants: A Systematic Review

Thomas Gill*, Nahal Razaghi, Anuya Patankar, Prof Shakeel Shahdad

The Royal London Dental Hospital

Email: thomas.ksgill@gmail.com

Introduction:

Primary stability of dental implants is considered critical for successful implant osseointegration and survival in situations where immediate implant loading is desired. However, there is paucity of evidence to conclude whether primary stability is equally critical in implants placed with early, delayed or conventional loading protocols. Insertion torque (IT) and resonance frequency analysis (ISQ) are commonly used non-invasive diagnostic surrogate methods for assessing primary stability. This systematic review aims to determine the significance of primary stability in achieving successful osseointegration in implants using non-immediate loading protocols.

Methods:

The review was registered with the PROSPERO database (CRD42020204143). An electronic search in MEDLINE, EMBASE, Web of Science and CENTRAL as well as hand searching was undertaken. All studies designs reported in English in humans were included if they had: at least 10 participants, implants placed with a non-immediate loading protocol, measured primary stability using IT and/or ISQ values and had survival data available for up to 1 year follow up after loading.

Titles and abstracts of the identified studies were screened and reviewed by two authors independently according to the inclusion criteria and duplicates removed using EndNote X9. Full text assessment occurred where relevant, followed by quality assessment. Data extraction was carried out by two authors. Risk of bias assessment was undertaken using the Cochrane risk of bias tool for RCTs and Newcastle-Ottawa scale for cohort studies. Descriptive analysis was performed for the non-comparative studies.

For the analysis, implants were dichotomised into having a ISQ of <60 or ≥60 and an insertion torque of <35 or ≥35. We undertook the Fisher's Exact test to determine if there was evidence of a difference between the proportions of survival and failures between the two groups, with a p-value of less than 0.05 indicating evidence of a difference between the groups. We then assessed the distribution of the values for the ISQ<60 and IT< 35 using the Mann-Whitney U Test for survival and non-survival.

Results:

A total of 3362 publication titles were identified. After duplicate removal and screening of titles and abstracts, 3104 records were excluded. 258 full text articles were assessed for inclusion of which 80 papers were accepted for analysis.

We found evidence to support that an IT<35 resulted in higher proportion (15.6%) of implant failures compared to an IT≥35 (1.9%) (p=0.015). We found no strong evidence for a difference in the proportion of failures for an ISQ<60 compared to an ISQ≥60 at placement (p=0.057). We found no evidence of a difference in the distribution of the ISQ (p=0.18) or IT (p=0.76) values for implants that survived and those that failed.

Conclusion:

This study found evidence to suggest an IT<35 results in a higher proportion of implant failures in implants placed with non-immediate loading; however no relationship between ISQ and survival could be determined. Due to the heterogeneity of studies, further high-level evidence with relevant baseline implant placement data are required to determine the true effect of primary stability on implant survival.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Management of Issues on Social Media

Anna C Greer*, Christopher W Stokes, Sandra Zijlstra-Shaw, John E Sandars

University of Sheffield

Email: acgreer7@gmail.com

Introduction:

A growing number of dental cases are being posted on social media, particularly cases showing fixed prosthodontic treatment. These cases can be motivating for aspiring prosthodontists but they also create issues including unrealistic patient expectations, feelings of inadequacy and misinformation. The objective of this study was to identify how dental students manage issues they encounter when using social media.

Methods:

A qualitative study was carried out using in depth interviews. Themes were identified by Framework analysis. A sampling matrix was used to ensure breadth of data.

Results:

Data saturation was achieved after 9 interviews. From the data, four social media user types emerged: "Sceptical"; "Fingers Burned"; "Blissful Ignorance", and those who "Know the Line". Each user type had their own management strategy for the issues they encountered. From the data it also emerged that students were aware of various stakeholder groups which influenced their management strategies, including the general public, the social media platforms and regulatory bodies.

Discussion:

Social media is ubiquitous with wider society therefore learning how to use it appropriately is a key skill. As the user groups perceive issues differently, definitions of appropriate use will also differ. These differences need to be addressed when teaching dental students about safe and successful social media use. The different user types also need to be considered when posting educational material on social media.

Conclusion:

There are four different types of social media users with different management strategies for dealing with issues. Further research involves the other stakeholder groups to assess how they manage issues with social media and how the stakeholder groups influence one another.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Small Tumour, Bulky Problem

S Hackett*, CJ Butterworth

Liverpool University Hospitals NHS Foundation Trust

Email: stephaniehackett@hotmail.com

A 58-year male diagnosed with cT1 N0 M0 SCC anterior maxilla, Brown classification 1c, was treated with anterior maxillectomy, right neck access and sentinel node biopsy, and reconstructed primarily with a non-vascularised iliac crest bone graft and radial forearm free flap (RFFF). He required 3 episodes of tissue debulking prior to dental implant placement, 11 months after initial treatment. His final implant retained prosthesis was fitted 5 months after implant placement. The patient had a history of hypertension and was medicated with amlodipine 5mg.

A small non-vascularised iliac crest bone graft was required since the defect was not large enough to house a composite flap. The RFFF provided mucosal coverage over the grafted bone to ensure integration. Due to the complexity of implant planning in this region with an excessive soft tissue flap and reduced prosthetic space, several debulking procedures were required in addition to inflammatory tissue excision from the flap area. The initial procedure removed the dermal layers and subcutaneous tissue bulk, however recurrent exophytic oral mucosa-like regrowth required further excisional procedures. Extreme care was taken to avoid incising the RFFF pedicle during the debulking procedures and diathermy was used to seal bleeding sites. The final excision of a doughnut lesion around the UL1,3 implants was cauterised with silver nitrate sticks and on review the lesion has not recurred.

Implant placement was digitally planned using an analogue wax up and four 12 degree co-axis implants were placed in a single stage procedure. Long abutments were used to offset the depth of placement into the grafted bone. The patient was restored with a fixed screw retained implant bridge spanning UR3 to UL3. He will be kept under close surveillance of the soft tissue and prosthesis, with particular attention to screw loosening and fracture in this parafunctioning patient and oral hygiene advice to prevent the recurrence of exophytic inflammatory tissue lesions around the implants.

Management of reduced prosthetic space is challenging in low level maxillary defects. This case demonstrates the surgical and prosthetic challenges of a complex aesthetic site. It is possible, yet not proven, that drug induced gingival overgrowth of free flap tissue may display similar characteristics to native oral mucosa, following removal of dermal layers. The use of silver nitrate cauterisation may be advantageous in ceasing regrowth of such lesions. Oral hygiene in these cases is of paramount importance to prevent lesions recurring and provisions in the final prosthesis must be made to enable patient access for plaque control.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Facilitating Restorative Dentistry During COVID-19: Learning from Collaborative Innovation in the NHS Workplace

D Hawkes*, KB Patel and JK Kilgariff

Dundee Dental Hospital and School

Email: daniel.hawkes2@nhs.net

Coronavirus has impacted dentistry. Aerosol Generating Procedures (AGPs) can result in airborne particles causing infection and restorative treatment involves AGPs. In March 2020, UK national guidance advised non-urgent dentistry is halted. This impacted significantly dental care provision and undergraduate and postgraduate training.

It became apparent that for AGPs, appropriate Personal Protective Equipment (PPE) was required. A successful face fit test for an FFP3 mask was needed for respiratory protection, but several members of staff and students were unsuccessful in passing because of an inadequate seal and/or an inability to remove facial hair for religious reasons. Such individuals could not provide AGP-related care. Therefore, these dentists could not discharge their duty of care and students could not gain experience essential for qualifications. Furthermore, PPE includes wearing visors, preventing coronavirus contacting ocular mucous membranes.

Many aspects of restorative dentistry benefit from magnification use. Common choices are dental loupes and/or dental operating microscopes (DOMs).

Another challenge encountered was using DOMs with visors, because operators must position their eyes at precise distances from the eyepiece. Visor wear increases this distance, reducing the field of view, distorting image and causing image reflections. Using dental loupes with a visor poses similar challenges.

Problems:

How can non-face fitted individuals provide Restorative Dentistry AGPs during COVID-19?

How can DOMs be safely used for AGPs without a visor for non-face fitted and face fitted individuals during COVID-19?

Potential solutions:

Powered hoods can be used if unsuccessful mask fit test. Disadvantage: Prevents clinicians using DOM and loupes.

Innovation:

Design and develop a dental unit hood, creating clinician-patient barrier. Disadvantage: Precludes DOM and loupes use.

Innovation:

Design and develop a hood enclosing patient and DOM body creating clinician-patient barrier. Advantage: Facilitates DOM use.

A scoping literature search revealed another dental unit was adapting PPE by attaching a visor to the DOM to act as a barrier. This negated clinician visor use but did not solve the problem for individuals unsuccessfully face fitted.

With no appropriate solution available, a hood innovation prototype (option c) was designed. Collaboration occurred with dental colleagues and the wider healthcare team including Medical Photography, Ophthalmology and ENT departments, both locally and overseas to share learning amongst those routinely using magnification in healthcare.

Scottish Health Innovations Ltd (SHIL) were approached with the prototype, the concept pitched, and patenting and prototype discussed. The project was deemed valuable to explore further and requisite paperwork completed.

Outcome:

The prototype was not taken beyond the mock-up conception stage; however, this process offered valuable learning.

Challenges encountered:

Engagement from other healthcare sectors.

Sourcing alternative, fit-for-purpose PPE/equipment to satisfy Infection Prevention Control regulations.

Staff and student engagement.

Conclusion:

A culture of shared learning across different healthcare settings and specialties is paramount. Our team learnt the importance of being adaptable in a complex reality, responding rapidly and considering innovation to ensure safe, appropriate, fit-for-purpose PPE and equipment was available in the new COVID workplace.

There is still no globally recognised solution for the issues this poster describes.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Use of a Bespoke 3D Printed Tooth Wear Case for Simulation

Rachael Jablonski*, Jaymit Patel, Syeda Khalid, Cecile Jones, Hannah Beddis, Andrew Keeling

University Of Leeds / Leeds Teaching Hospitals NHS Trust

Email: R.Jablonski@leeds.ac.uk

Introduction:

Advances in digital and 3D printing technologies have enabled the emergence of new education tools for surgical trainees. Simulation exercises form an essential component of dental education and provide learners with the opportunity to acquire and develop technical skills. The COVID-19 pandemic significantly impacted dental training, and thus increased the demand for realistic simulation technologies.

Clinical simulation commonly involves the utilisation of typodont models with well aligned arches, idealised tooth relationships and without an ability to consider the occlusion. Recent innovations have made steps towards simulating "true-to-life" variation in medical and dental pathologies. This provides the opportunity to simulate the treatment of a range of pathologies with greater realism whilst also enabling trainees to repeat treatment of the same teeth, thus supporting an iterative learning process.

Our aim was to utilise digital technologies to simulate the planning and treatment of a tooth wear case as part of a training course provided to general dental practitioners.

Method:

A bespoke full mouth tooth wear case was developed for teaching purposes based upon the clinical records, study casts and diagnostic wax-up of a patient with tooth wear previously treated at the Leeds Dental Institute. Individual teeth and dental arches were designed based upon a scan of the preoperative study casts taken with a custom-built in-house 3D model scanner. Individual teeth, dental arches, gingivae and diagnostic wax-ups were 3D printed in resin (Model Resin V2 and Flexible 80A; FormLabs) using an affordable in-house printer (Form3; FormLabs) to produce bespoke cases at a fraction of the cost of standard plastic dental models.

Seven learners, who work in primary dental care in England, attended for two days of training. Each learner was provided with a mix of didactic and practical training utilising 3D printed models of the untreated dentition and an idealised tooth form simulating a diagnostic wax-up. The models comprised separate 3D printed teeth, dental arches and gingival components thus facilitating recreation of the interdental spaces and contact points. The models were mounted in traditional phantom heads and articulated to enable assessment of the occlusion.

Results:

The utilisation of a bespoke case had notable positive impacts on training when compared to the use of typodont models. Several areas of learning were unique to this scenario including the impact of the severity of tooth wear on the treatment strategy, the relevance of tooth malposition on the delivery of restorations and management of the occlusion.

Conclusion:

The simulation technique described above was successful in creating a more realistic teaching case when compared to conventional typodont models. Whilst this provided opportunities to enhance the learning experience and further develop the technical skills required to provide this type of treatment, there remain areas for further development including accurate colour reproduction of 3D printed teeth and soft tissues, as well as accurate reproduction of the mechanical properties of the hard and soft tissues including the compressibility of the soft tissues.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

A Tough Pill to Swallow: Elective Dental Extractions to Facilitate Trans-Oral Pharyngeal Pouch Stapling

A Jebril*, CJ Butterworth

Dept. Maxillofacial Prosthodontics, Liverpool University Hospitals NHS Foundation Trust

Email: ahmed.jebril@nhs.net

Background:

There are limited reports of elective dental extractions as a method of facilitating access in patients undergoing ENT surgeries[1]. However, there are circumstances in which such a drastic approach is appropriate in order to achieve a successful surgical outcome in complex patients.

Case Report:

A 66-year-old gentleman presented to the ENT department at the Liverpool Head & Neck Centre complaining of dysphagia, choking, and regurgitation. His general health and wellbeing had declined due to difficulties taking both food and medications, with significant impact on his quality of life.

Barium swallow confirmed a Zenker's Diverticulum - or pharyngeal pouch - an outpouching of the pharynx at the level of the larynx secondary to the formation of a fibrous band of muscle at the top of the oesophagus. Symptoms include regurgitation and choking, and these may lead to recurrent cough or aspiration pneumonia.

Cases are usually managed via two methods; an open surgical approach or the less invasive transoral endoscopic approach. The latter significantly reduces surgical morbidity, and it has become the primary approach utilised by surgeons. The aim of treatment is to divide the separating wall between the pouch and the oesophagus, thereby reassimilating the pouch into the pharynx.

Prior to referral to the Maxillofacial Prosthodontic department, three attempts had been made by ENT surgeons to access and staple the pouch. All attempts were limited by inadequate access, predominantly due to limited mouth opening and neck stiffness. At this stage, a novel technique involving the extraction and immediate implant replacement of the maxillary incisors was undertaken as part of an MDT approach to facilitate the endoscopic obliteration of the pharyngal pouch.

Utilising an amalgamated radiographic and digital pathway, the extraction and immediate replacement of both central incisors was planned with the immediate placement of two tapered 24 degree Co-Axis External Hex Implants in the maxillary central incisor positions to allow the construction of a subsequent screw-retained bridge. Following atraumatic extraction, the implants were placed into the extraction sites with excellent primary stability. Multi-unit abutments and wide gingival healing caps were placed at the time of surgery to optimise soft tissue healing. A temporary, removable partial denture was fitted immediately following surgery followed by definitive screw-retained implant bridgework at 4 months post operatively.

The patient made a rapid post-operative recovery, with significant improvement in his symptoms, excellent prosthodontic result, and has yet to require any subsequent additional procedures. Should he require any additional ENT procedures, his bridgework can be easily removed to facilitate further surgery.

References:

1. Butterworth CJ, Lancaster J, Shah HS. Elective dental extractions and osseointegrated implant replacement to facilitate transoral endoscopic ENTsurgical procedures. *J Laryngol Otol.* 2015 Dec;**129**(12):1234-7.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Evaluation of Mastication of Wearers Of Removable Partial Dentures with Distal Extension Edentulism

PI Kamara*, K Badji, PA Lecor, D Diop, M Gueye, EB Mbodj

Dental Institute Of Dakar, Cheikh Anta DIOP University

Email: pikasso2000@hotmail.com

Background/aim:

Removable partial denture is a restoration designed to improve the mastication of partially edentulous patients. The aim of this study was to evaluate the mastication of subjects wearing a metal partial denture restoring Kennedy's class I and II edentulism and to compare them with a control group.

Materials and methods:

The evaluation included 33 subjects with RPD (removable partial denture), 82% of whom had Kennedy class I edentulism and 18% had class II edentulism. Among them, 54.5% were women and 45.5% were men. The age group 46-71 years was predominantly represented in this study with 75.7%. The subjects who had worn their prostheses for 6 months were in the majority with 57.57% of the population. Wearers of complete denture (RCD) with partial denture (RPD) were more represented with 66.7%. Concerning the length of edentulism (LE), 42.4% had a small LE, 39.4% a medium LE and 18.2% a large LE. Peanut and carrot were used as test foods. Video recordings were used to collect values for the number of chewing cycles and chewing times. After passing through the calibrated sieves, a "Mastica" input mask was used to record the average particle size of the chews (D50).

Results:

For both test foods, the number of chewing cycles was twice as high with RDP wearers compared to the control subjects. For the duration of the sequence, subjects with RDP performed twice as long for the carrot and three times as long for the peanut to make the food suitable for swallowing. The average D50 of RDP subjects was similar to that of the control subjects, i.e. 1.90 mm ± 0.19 (D50 peanut control: 1.93 ± 0.5) and 1.74 mm ± 0.36 (D50 carrot control: 1.79 ± 0.44) for peanut and carrot respectively.

Conclusion:

This study revealed that subjects with RPD restoring distal extension edentulism had efficient compensatory chewing with a greater number and time of chewing sequences than randomly selected normodentate subjects. The comparative analysis between the chewing kinetic parameters of the RPD wearers and control subjects was statistically significant.

Keywords:

Chewing, Distal edentulous, Class of Kennedy, Removable partial denture, Granulometry

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Modified Screw-Retained Obturator Impression Technique following Recurrence after Maxillary ZIP Flap Reconstruction

S King*, CJ Butterworth

Liverpool University Hospitals NHS Foundation Trust

Email: drsking02@gmail.com

The Zygomatic Implant Perforated (ZIP) flap technique[1] has been well established for many years for the management of low-level maxillary malignancy. It combines the placement of zygomatic implants at the time of primary oncological resection together with microvascular soft tissue free flap reconstruction of the resulting oro-nasal defect to allow immediate palatal reconstruction and rapid fixed dental rehabilitation. A recent cohort study has demonstrated high survival rates of implants and prostheses despite 60% of this cohort requiring adjuvant radiotherapy, together with excellent patient related outcome measures[2]. However, it is clear that this group of patients have worse disease survival with higher rates of local and regional neck recurrence with the 2-year survival being reported at 62% and the 5-year survival being 42% in a recent study of maxillary tumours[3]. When local recurrence occurs following a ZIP flap reconstruction, it is inevitable that part of the original reconstruction will be removed, necessitating a further free flap or a change of approach towards prosthetic obturation especially in the elderly or irradiated patient. This involves changing the patient from their initial implant supported fixed bridge prosthesis into an implant supported removable obturator to allow defect hygiene and observation. The presence of existing zygomatic implants not only provides essential "in-defect" support and retention but allows an accelerated rehabilitation for patients dealing with their second oncological resection. We present the workflow for patients in this situation from surgical obturator construction, fitting and modification together with the subsequent use of a screw-retained maxillary impression tray to obtain a suitable impression of the implants and associated defect to allow the fabrication of an implant retained bar obturator, without the danger of getting impression materials stuck in the undercuts associated with the implants.

References:

1. Butterworth CJ, Rogers SN. The zygomatic implant perforated (ZIP) flap: a new technique for combined surgical reconstruction and rapid fixed dental rehabilitation following low-level maxillectomy. *Int J Implant Dent*. 2017 Dec;**3**(1):37.

2. Butterworth, CJ., Lowe, D., & Rogers, S. N. The Zygomatic Implant Perforated (ZIP) flap reconstructive technique for the management of low-level maxillary malignancy – clinical & patient related outcomes on 35 consecutively treated patients. *Head & Neck*. 2021 doi:10.1002/hed.26933

3. Rogers SN, Adatia A, Hackett S, Boscarino A, Patel A, Lowe D, Butterworth CJ. Changing trends in the microvascular reconstruction and oral rehabilitation following maxillary cancer. *European Archives of Oto-Rhino-Laryngology* 2022 (In press)

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Failing Anterior Bridge Replacement Using Digital Shade Taking Technology: A Case Report

Sunie Kundi

Kings College London

Email: sunie_kundi@hotmail.com

Replacement of existing crown and bridge work is a challenge even for the most seasoned of clinicians, predictable treatment planning and accurate diagnostics is imperative prior to undertaking complex anterior prosthodontic care, especially today where litigation is at an all time high. Technology has evolved over the years providing useful adjunctive tools to clinicians and allowing more predictable clinical outcomes for patients.

This case report highlights prosthodontic management of a 59-year-old female requiring anterior rehabilitation of failing anterior bridge work utilising digital shade taking technology. Initial stabilisation and prevention were carried out prior to anterior rehabilitation. Multiple provisional bridges were trailed prior to prescription and fit of the definitive prosthesis, namely due to modifications required in the patient's aesthetic demands. An innovative shade taking system: ELAB prime (© Sascha Hein) was used in conjunction with calibrated digital photography and cross polarisation to obtain optimal and predictable shade prescription for this case. Patient satisfaction was high with predictable anterior aesthetics and function achieved. This case report highlights the importance of undertaking robust clinical research of these technologies to validate their use within clinical practice and shift our practice toward the digital age of dentistry.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

The Use of 3.0mm Diameter Implants to Restore Congenitally Missing Teeth at Cardiff University Dental Hospital

Ruby Long*, Matthew BM Thomas

Cardiff Dental Hospital

Email: longr4@cardiff.ac.uk

Background:

Hypodontia has been shown to have a prevalence of up to 7.6%. Maxillary lateral incisor teeth and lower incisors are often missing. Prosthodontic treatment is often required to fill residual spaces that are not suitable for orthodontic space closure. Resin bonded bridgework and dental implants are the most appropriate fixed restorations in this group of patients. Implants have been shown to provide a reliable functional solution for the replacement of teeth. However, hypodontia can result in narrow edentulous ridges bucco-lingually and narrow gap size mesio-distally which may pose difficulties for conventional implant treatment. The use of a narrow implant of 3.0mm provides an implant solution in cases where there may have been insufficient bone for a conventional implant.

Case Series:

This case series poster illustrates how narrow diameter implants have been used in a series of cases at CUDH to provide tooth replacements in cases where it would not have been possible to provide conventional diameter implants due to a lack of bone width or limited gap size. The treatment planning considerations are discussed including the advantages and disadvantages of narrow diameter implants and a review of the available literature is presented. The limitations of narrow diameter implants will also be discussed.

Conclusion:

This cases series shows how 3.0mm diameter implants may provide a dental implant solution when alveolar ridge width or gap size may be compromised, as is the case of patients with hypodontia.

ejprd.org - Published by Dennis Barber Journals.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Non-Surgical Management Palatal Tori with Denture Provision

Syed Mustafa* and Andrew Pye

University of Dundee

Email: Syed.mustafa5@nhs.net

Palatal Tori or Torus Palatinus can often prove difficult in denture provision should route of surgery not be contraindicated. The case report looks at the denture provision management of an 82 year old female patient referred to the Dundee Dental hospital due to loose dentures. The poster looks into the challenges in denture provision involving a single tooth and a large midline palatal tori. The patient's unique medical background is also explored. A successful outcome was achieved using the Molloplast B.

References:

Al Quran FAM, Al-Dwairi ZN. Torus Palatinus and Torus Mandibularis in Edentulous Patients. *J Contemp Dent Pract* 2006 May;(7)**2**:112-119

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Craniofacial Anchorage for Rapid Rehabilitation of a Massive Palliative Facial Resection

R Newton*, CJ Butterworth

Liverpool University Hospitals NHS Foundation Trust

Email: rinewto04@googlemail.com

The treatment of large destructive tumours of the midface is complex and presents the multi-disciplinary team with many difficult decisions to make about possible reconstructive and prosthetic options especially where a significant lip resection is required.

From a patient perspective, cancers of the midface can have a huge impact physically, socially, and psychologically. Excellent communication between all members of the team involved in their reconstruction and rehabilitation is vital in order to optimise a patient's ability to eat, speak, and live as normal a life as possible following treatment.

This poster demonstrates the use of orbital rim and zygomatic implants to support the facial rehabilitation of a 51-year-old female patient with a huge recurrent tumour of the midface necessitating removal of the right eye, orbital floor, upper lip as well as a sub-total maxillectomy. She had had previous surgery and adjuvant radiotherapy in 2014 in a different centre involving total rhinectomy and prosthetic rehabilitation via nasion and nasal floor implants. The initial pathology was reported as adenoid cystic carcinoma. Unfortunately, she developed local and regional recurrence of her disease with lung metastases prior to relocating to the Merseyside region. This led to loss of the nasal floor implants and some local tumour growth which was initially being managed conservatively due to the presence of significant chest disease. In 2020 her midfacial tumour growth accelerated significantly and a further biopsy revealed the presence of a relatively undifferentiated myxoid adenoma carcinoma causing rapid destruction of the upper lip together with bleeding. She was discussed at the MDT and whilst some were not in favour of her treatment, the patient was offered radical surgery with palliative intent in order to remedy the increasingly worsening situation.

The tumour extended anteromedially from the left inferior and middle nasal meatus, superiorly to the floor of the anterior cranial fossa and through the floor of the right orbit, laterally through the wall of the maxillary antrum, and inferiorly into the oral cavity. She underwent surgical removal of her right hemi-maxilla, right upper lip, right eye and orbital floor with concomitant insertion of zygomatic and dental implants into the right orbital rim and an antero-lateral thigh flap reconstruction to upper lip and maxilla. Planning software was used to plan the position of 2 x 10mm tapered dental implants into the right orbital rim and a bone supported pilot guide was designed using Meshmixer software and printed using biocompatible resin. Following the surgical resection, implants were placed into the orbital rim and 2 zygomatic implants were placed horizontally across the face to provide additional support. All implants achieved excellent primary stability. Abutments were placed and impressions taken of the facial defect in order to fabricate a splinted bar housing two large maxillofacial magnets. The bar was fitted 18 days after surgery and allow the retention of a facial prosthesis shortly afterwards. The patient is currently stable with no recurrent midfacial disease clinically and continues to be monitored for her chest metastases.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Use of Alberta Reconstructive Technique (ART) within the Leeds Dental Institute (LDI)

N Patel*, J Patel, D Gray, T Hodson, Z Ali, M Ho

Leeds Dental Institute

Email: nimit.patel@nhs.net

Background:

Segmental resection of hard and soft tissues due to tumours affecting the oral cavity can significantly affect oral health-related quality of life. Reconstruction techniques have been developed to maintain jaw relations and facial contour, including reconstruction plates, local flaps, regional pedicled flaps, and composite free flaps.

A recently described technique employs early implant placement before free tissue transfer based on pre-surgical three-dimensional planning. This technique allows placement of dental implants before radiotherapy, reducing the potential risk of osteoradionecrosis, and expedites dental rehabilitation with the potential to improve patient-reported quality of life.

Current Practice:

Where dental implants are indicated in the rehabilitation of oncology patients planned for resection, placement is often delayed until after surgery and completion of adjunctive treatments such as radiotherapy, resulting in a delay in oral rehabilitation.

Use of Alberta Reconstructive Technique (ART): The ART utilises medical and cone beam computed tomography (CT & CBCT) data to digitally plan reconstruction, allowing for fabrication of guides for tumour resection, implant placement, osteotomy cuts and fabrication of custom titanium plates. Placement of implants at primary surgery reduces overall treatment time and allows for osseointegration before any adjunctive radiotherapy.

Case Reflections:

Within LDI, we have five patients for whom ART has been used. This cohort included six composite flaps (with one patient requiring two flaps) - four were fibula flaps, one DCIA and one scapula. Digital planning was facilitated by Individualised Patient Solutions® (KLS Martin Group) and Trumatch® CMF Personalised Solutions (DePuy Synthes/Materialise). Dental implants were placed within the flap at the time of harvest, before free tissue transfer, by a Consultant/Registrar in Restorative Dentistry with the use of surgical guides.

Over time, we have reflected on the positive and negative implications for the restorative dental team. Direct visualisation at the level of the harvested flap improves access for implant placement, though modifications to technique are required with the use of stents. Implant positioning is entirely reliant on the accuracy of planning and avoidance of deviation in the plan with respect to the final flap position. Placement of implants at primary surgery does allow for overall treatment time to be reduced though exposure of implants and prosthodontic treatment may be delayed by complications arising post-operatively, as a result of radiotherapy. Delays may also occur due to the psychological impact for the patient with respect to treatment fatigue after primary management of their cancer. This technique ensures placement of dental implants in a site that hasn't been exposed to radiotherapy, though in many cases the flap, and peri-implant bone will subsequently be irradiated during the early phase of osteointegration. Finally, prosthetic stages are still technically demanding due to the altered anatomy and other factors such as trismus.

Whilst outcomes for this small cohort have been positive amongst all key groups within our unit, including patients, we reflect on the considerations to be taken when implementing this technique, from clinical, resource management and patient pathway perspectives, which will continue to be refined as this service expands.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

New Frontiers in Head and Neck Oncology Care: A Novel Approach to Complex Care Streams

Kajal B Patel*, Naren Thanabalan, Mike Williams, Mirwais Husseini, Raj Dubal

Royal London Dental Hospital, Barts Health NHS Trust

Email: kajal.patel24@nhs.net

Introduction:

The Barts Health Head and Neck Cancer Service has a large referral base and involves an extensive network of healthcare providers to ensure integrated and coordinated multidisciplinary care. Our overall aims are to improve patient quality of life and limit survivorship burdens.

Patients undergoing maxillofacial oncological resection often require a cover plate to be constructed pre-surgically. This involves recording impressions of the intraoral structures, which can be uncomfortable for the patient and challenging for the clinician, in the presence of extensive tumour growth, abnormal anatomy and severe trismus. The use of three-dimensional printing can play a valuable role in the rehabilitation of patients who are undergoing or who have undergone surgical resection. This can enable a more streamlined cancer pathway and may improve patients' quality of life more promptly than conventional prosthodontic procedures. These measures can be all the more valuable in end-of-life care and palliation.

Case Report:

A 51-year-old male was diagnosed with a T4N0M0 Basaloid Squamous Cell Carcinoma of the left paranasal sinus. He was due to have chemoradiotherapy following surgical intervention. After the first cycle, a CT scan of the orbit revealed disease progression with extensive bony destruction and involvement of the intracranial compartment superiorly. The Head and Neck Cancer Multi-Disciplinary Team concluded that radical surgery was no longer an option and palliative care was planned. The tumour was doubling in size fortnightly, causing severe pain, bleeding and facial disfigurement. A palliative debulking maxillectomy with the provision of a cover plate was planned to help improve symptoms, function and aesthetics. The surgical team liaised with the Restorative Dentistry team for construction of the cover plate, however there was no opportunity to examine or record an impression. The challenges encountered were the tumour size, small window of time for cover plate construction and no intermediary dental appointments, leaving no margin for error.

As it was not readily possible to record a conventional impression, the DICOM file for a recent CT scan was imported into the InVesalius 3.0 software. Close teamworking with the maxillofacial prosthetists enabled a three-dimensional model of the CT scan to be printed, and impressions were recorded of the denture-bearing area and the adjacent teeth. The resultant dental casts were mounted on an average-value articulator. The planned resection was discussed with the surgical team, which helped to inform the extension of the cover plate required and number of teeth to be set-up to restore function and aesthetics. From the CT scan to prosthesis finish took 56 hours with no additional cost or resources.

Conclusion:

Collaborative multidisciplinary teamworking is essential to bring such a plan into fruition. The novel approach described can be used to prevent delays in the oncology pathway and reduce the burden on clinical resources, even when patient access is limited. More importantly, the technique described did not hinder the patient's quality of life and dignity during their end-of-life care. Future application may avail entirely digitally planned and printed prostheses, reducing the time and resource required.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Implants Versus the Natural Dentition - Which Way Does the Pendulum Swing?

Fayjel Shah*, Shiyana Eliyas

St George's Hospitals NHS Foundation Trust, London

Email: fayjel@hotmail.com

Introduction:

The aim of this presentation is to highlight the difference in progression and outcomes between periodontitis and peri-implantitis in the absence of prevention and maintenance, by reporting on a 16 year follow up, of a 38-year-old male, who underwent major maxillofacial and dental rehabilitation. An overview is given of the outcomes of periodontitis and peri-implantitis, survival of various implant prostheses, and maintenance required for these complex cases. This case is presented with visual aids including a video demonstration, dental photography and radiographs, and highlights the need for early implant risk assessment.

Case:

The gentleman first presented to the Restorative department in 2006, aged 22, following stabilisation of major trauma, due to a fall from the second floor of a building. He sustained Le Fort II fractures, mandibular fractures and severe dentoalveolar trauma leading to loss of multiple dental units. He underwent extensive bone grafting and replacement of 12 units with 4 implant retained fixed dental prostheses. After the definitive dental restorations were provided, he failed to attend for maintenance and follow up for over 16 years. Now aged 38, he presented again with exfoliation of all his implants. A conventional removable appliance to replace the missing teeth has been made, which provides a suitable, non-invasive and predictable long-term replacement for this patient.

The pattern of bone loss was interesting, as the natural teeth exhibited very little further bone loss in this time frame, in contrast with the implants which lost all the supporting bone. Patients may adapt, with unusual means to implant failure. The video shows the patient utilising his anterior implant bridgework as a removable appliance despite failure of osseointegration and total loss of bone support.

Discussion:

Current NHS funded dental implant treatment covers the active course of treatment but does not cover post-treatment maintenance costs. Therefore, a caveat to NHS funded dental implant treatment, being that patients must be made aware of the future maintenance burden, replacement costs and are willing to self-fund these. Determining a patient's overall risk profile in developing peri-implant diseases is essential but challenging in the treatment planning phase and can help identify those individuals less suitable for implant rehabilitation at an earlier stage.

Conclusion:

The importance of prevention and maintenance is key for the success of implants, especially in patients with periodontal susceptibility. Accurate risk assessment and case selection allows for more predictable restorations. Patient compliance, and onus, for regular and long-term maintenance is key for both implants and the natural dentition, perhaps more so for implant survival.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Use of a Mid-Palatal Implant for Retention of a Maxillary Overdenture in an Ectodermal Dysplasia Patient with Severely Under-Developed Maxilla

Naren Thanabalan* and Shakeel Shahdad

The Royal London Dental Hospital

Email: n.thanabalan@nhs.net

Introduction:

Ectodermal dysplasia (ED) consists of a large group of inherited disorders characterised by defects in tissues of ectodermal origin, which can affect the hair, teeth, nails and eyes. Patients with ED may present with varying severity of hypodontia from missing 1-2 teeth to the complete absence of teeth. This may result in reduction or absence of alveolar bone growth, which can pose treatment challenges in replacing teeth for function and aesthetics. Under-developed alveolar ridges make implant planning and treatment very challenging due to the severe reduction in height and width of bone available. In these cases, extensive bone augmentation procedures are often unpredictable. Extra-maxillary implants may be an alternative treatment option; however they can be invasive and costly procedures. Patients who do not provide consent for these invasive procedures require innovative decision-making to deliver an optimal and predictable functional prosthodontic outcome.

Case Report:

A 23-year male was referred to the Restorative Dentistry department at The Royal London Dental Hospital. The patient's primary complaints were unretentive maxillary and mandibular conventional dentures and wanted to explore different treatment options. The patient was diagnosed with ED and presented with severely under-developed maxillary and mandibular alveolar ridges. Only the maxillary central incisor roots were present with hypodontia of the remaining permanent and primary dentition. The cone-beam CT imaging revealed a lack of bone volume in both arches and complicated by bilateral pneumatisation of the maxillary sinus. The treatment options were discussed with the patient including (i) new conventional complete dentures (ii) alveolar implants to support overdentures (iii) implants for a fixed prosthesis with extensive bone augmentation and sinus lift (iv) extra-maxillary implants to support overdentures. The patient was not keen on extensive surgery or bone augmentation and opted for alveolar implants to support an overdenture.

Using Co-Diagnostix® implant planning software, two 10mm Straumann® standard plus narrow neck implants (Ø3.3mm) were placed in the anterior maxillary ridge with simultaneous guided bone regeneration with bovine deproteinized bone and porcine collagen membrane. To improve the anterior-posterior spread and retention for the overdenture, a 4mm mid-palatal implant (Straumann® standard plus regular neck, Ø4.8mm) was placed. Two 8mm standard plus narrow neck implants (Ø3.3mm) were also placed in the mandibular inter-canine region. Following osteointegration, appropriate Novaloc® locator-type abutments were placed with 15-degree angled abutments chosen for the maxillary implants to optimise the path of insertion. Maxillary and mandibular implant-supported overdentures were then constructed, and the patient was rehabilitated with a successful outcome.

Conclusion:

There are no long-term studies that detail the clinical success or patient-reported outcomes for the use of mid-palatal implants in under-developed alveolar ridges. From this case, the use of a mid-palatal implant in a severely under-developed maxillary alveolar ridge is an alternative treatment modality to extensive grafting procedures and extra-maxillary implants and can be strategically used to improve retention for an overdenture. The patient remains under follow-up within the department to determine if any implant or prosthodontic issues arise.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Gone But Not forgotten; A Case Report on Auto-Bridges

Andre Xavier* and Richard Holliday

Newcastle Dental Hospital

Email: andre.xavier@nhs.net

Background:

There are many consequences of periodontal disease including gingival recession, tooth mobility, drifting and tooth loss. Periodontal therapy can be effective in stabilising disease progression and maintaining the remaining dentition. However, when disease is severe the retained teeth can often have suboptimal aesthetics and prosthodontic skills are required to improve the outcome for patients. Often a decision is made to remove teeth and provide a removable prosthodontic replacement. In some cases, depending on the distribution of teeth and extent of support, fixed prosthodontic options can be an option. In this case we present the use of an immediate natural tooth bridge – an 'auto-bridge'.

Case details:

A 52-year-old female patient with unstable periodontal disease was referred for specialist periodontal input. Her periodontal disease was stabilised with several rounds of non-surgical and surgical periodontal management. The patient then presented with concerns about the aesthetics of her anterior teeth which had drifted and were mobile. Orthodontic treatment was explored and not possible. The mandibular incisors were removed and replaced with an acrylic partial denture. After a period of acclimatisation, the maxillary central incisors were removed and used to form an auto-bridge. This involved the use of a kesling set-up to optimise the position of the teeth and a metal backing was constructed to aid in the attachment of the extracted teeth. Following extraction, the teeth were root treated using biodentine in the root canals to facilitate sectioning. A putty index based on the wax up was used to locate the teeth in the correct position. The metal framework was then attached with a resin cement.

Discussion:

Anterior tooth loss can have a significant impact on a patient's quality of life. Auto-bridges are a minimally invasive, relatively quick and reversible treatment option which provides a viable aesthetic solution. Careful case selection is important and indications include sound abutment teeth and a favourable occlusion. The extracted teeth being used as bridge pontics should also be clinically sound. This poster aims to highlight the clinical steps required for auto-bridges.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.

Coltene Poster Award Winner

Prosthodontic Management and Full Mouth Rehabilitation of a Patient with Severe Tooth Wear - A Case Report

Har-Amrit Singh

Birmingham Dental Hospital

Email: h.singh09@hotmail.com

The diagnosis and management of tooth wear is an important skill for dental practitioners to acquire and is becoming more significant as the population are retaining their teeth later in life. If left unmanaged, patients can present with complex restorative, prosthodontic and aesthetic situations. This case report highlights the full mouth rehabilitation of a patient with severe tooth wear and integration of both fixed and removable prostheses into a reorganised occlusion.

A retired, partially dentate, 78 year old male patient presented on undergraduate clinics at Birmingham Dental Hospital complaining of 'multiple lost crowns and fillings, a loose and worn denture, teeth wearing away, finding it hard to eat, and unhappy with the aesthetics of his broken smile'. Key findings from the history identified a high acidic diet and nocturnal bruxism parafunction.

Thorough clinical examination and special investigations revealed a heavily restored dentition, generalised periodontitis, caries, decemented crowns, restorations with defective margins, chronic apical abscess and generalised NCTSL. Diagnoses were listed and risk assessment carried out prior to discussing treatment objectives and options with the patient. A staged treatment plan was formed involving (i) prevention and stabilisation, (ii) diagnostic, (iii) definitive restorative and (iv) maintenance phases.

Stabilisation involved dietary analysis and advice, oral hygiene instruction, initial periodontal therapy, caries removal and to complete the previously initiated RCT UR5. As part of the diagnostic phase, articulated study casts and diagnostic wax ups were requested with a view to provide a mutually protected occlusal scheme, increase the occlusal vertical dimension, and correct the maxillary cant. The anterior teeth were restored using upper indirect palatal-incisal veneers and lower direct composite restorations. Overdenture abutment preparations, full veneer crowns and upper and lower partial dentures were combined to restore the posterior dentition. A Michigan splint was constructed as part of the maintenance phase to protect against nocturnal bruxism parafunction and the patient was advised to maintain regular recall visits.

European consensus for the management of severe tooth wear recommends a conservative, adhesive approach and this was implemented in this case with the anterior composite restorations. Resin composite was used due to sufficient enamel for predictable bonding and ease of adjustment and repair. Upper indirect composite palatal-incisal veneers provided greater control of the occlusal contour and occlusal vertical dimension, reduced chairside time and superior strength.

Reassessment following the anterior restorations facilitated the planning of fixed and removable prostheses integration. The full veneer crowns were constructed with milled rest seats, guide planes and bulbosities in order to help support and retain the removable partial dentures. Overdenture abutment preparations offered alveolar bone retention, support for removable prostheses and potential for the use of precision attachments in the future.

An appreciation of the aetiology, diagnosis and conservative management of severe tooth wear was gained during this case and how understanding patient expectations and providing holistic care can result in predictable patient-based outcomes.

Copyright ©2022 by Dennis Barber Ltd. All rights reserved.