# SEVERE TOOTH WEAR REHABILITATION & PROTHODONTIC MANAGEMENT

**SIMRANPAL BHAVRA**
**BDS**

bsspd The British Society of Prosthodontics

## *COMPLAINTS:*

- Patient unhappy with the '**look of their teeth**'
- **Loss of confidence speaking** to others due to aesthetics
- **Functional difficulties** due to broken down teeth and edentulous saddles
- **Sharp edges** of teeth feeling '**uncomfortable**'




### *Medical history:*

- Medically fit & well

### *Dental history:*

- Regular attender to Birmingham Dental Hospital
- Previous hard occlusal guard made by dentist 3 years ago
  - Stopped wearing
  - No longer fitting
- Restorative and Root canal treatment carried out by previous student - no issues
- No history of denture wearing

### *Diet:*

- 3 cups black coffee daily – no sugar, Occasional fizzy drinks, 50g dark chocolate per day, Bowl of fruit per day, including oranges

### *Social history:*

- Non-smoker - quit 8 years ago - previously smoked 8 cigarettes/day for 40 years
- Alcohol – non-drinker - Stopped consuming alcohol 3 years ago - Previously consumed 10 units/day; including lager, cider and wine - over a 30-year period
- Occupation: Carpenter, Stress levels: 5/10, Looks after terminally ill brother

### *Diet:*

- 3 cups black coffee daily – no sugar, Occasional fizzy drinks, 50g dark chocolate per day, Bowl of fruit per day, including oranges

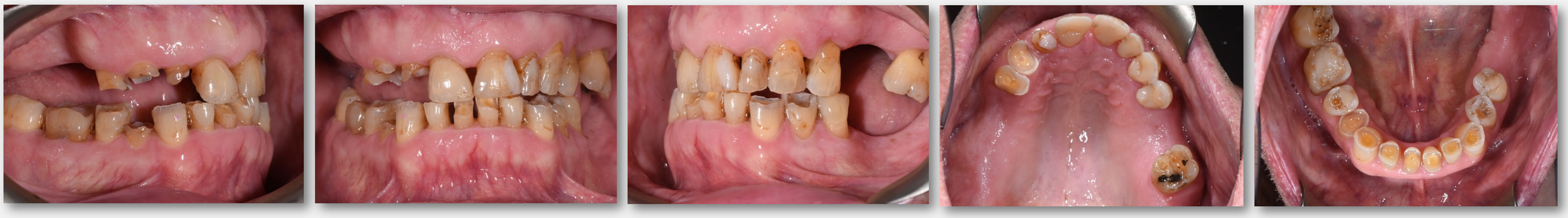
### *Oral hygiene regime:*

- Mouthwash in the mornings, brushing at night-time, Electric toothbrush, Fluoridated toothpaste, Toothpick for interdental cleaning

### *Family history:*

- Nil

## *PRE-OPERATIVE*



## *EXAMINATION*

### *Soft tissues:*

- NAD
- No evident tongue scalloping or soft tissue keratoses

### *Hard tissues:*

- Generalised NCTSL – primarily involving **LL54321 LR12345**
  - Non-compensated pathological erosive/attrition tooth wear
  - Extending into dentine
  - Generalised cupping lesions of incisal/occlusal surfaces
  - Presenting functional and aesthetic patient concerns
- **UR234 LR4** extensive loss of coronal tooth tissue
  - Extending close to gingival margins
  - Presenting with sharp edges
- **UR1 UL123** palatal composite veneers
- **UL6** occlusal staining

### *Kennedy classification:* [1] *Miller 1970*

- Upper: Kennedy Class II Mod 1

**BPE**

| | | |
|---|---|---|
| X | 2 | 2 |
| 2 | 2 | 2 |

**BEWE**

| | | |
|---|---|---|
| 3 | 2 | 2 |
| 3 | 3 | 2 |

[2] *Bartlett et al 2008*

## *SPECIAL TESTS AND INVESTIGATIONS*

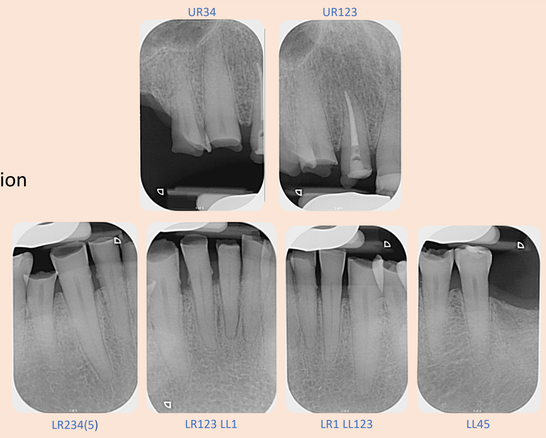
### *Radiographs:*

**PAs recorded to assess any caries, bone levels and apical pathology:**

- Generalised 20-30% horizontal bone loss
- UR2 radiopacity – indicative of root canal filling and coronal restoration
  - Well condensed, no voids, obturation within 2mm of apex
- LR1 PDL space widening
- No evidence of radiolucencies indicative of caries
- Subgingival calculus deposits LR23 LL13

### *Further testing*

- **Endofrost (sensibility)** – all teeth +ve (excluding UR2 root filled)
- **Mobility**: - Nil mobility associated with any teeth
- No TTP




### *Risk assessment:*

1. **Oral cancer: High**
   - Previously smoked 8 cigarettes/day for 40 years
   - Previous high alcohol consumption (highlighted in SH)
2. **NCTSL: Moderate**
   - Previous erosive and attritive wear
   - Stopped alcohol consumption 3 years ago
   - Fruit consumption daily – acidic content
3. **Caries: Moderate**
   - Daily chocolate consumption 50g
   - Occasional fizzy drinks
4. **Periodontal disease: Moderate**
   - Stage II Grade A, currently stable, risk factors – previous smoker 8 years ago

## *DEFINITIVE DIAGNOSES:*

1. Generalised Periodontitis Stage II Grade A, currently stable, risk factors – previous smoker 8 years ago
2. Generalised non-compensated pathological erosion/attrition NCTSL extending into dentine
3. UR234 heavily broken-down coronal tooth structure with sharp edges
4. Upper Kennedy Class II Mod 1

## *TREATMENT OBJECTIVES:*

- Improve oral hygiene
- Stabilise/maintain periodontal health
- Restore function and aesthetics of dentition
- Restore any missing teeth spaces
- Review and maintenance of healthy dentition

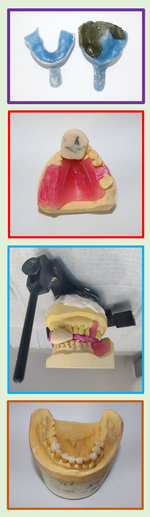
## *TREATMENT PLAN*

### 1. PREVENTION AND STABILISATION

- Plaque and Bleeding score, DPC
- Step 1 Periodontal therapy
- Tailored OHI and Diet sheet for dietary analysis
- Supra/sub gingival PMPR
- Re-evaluation after 3 months

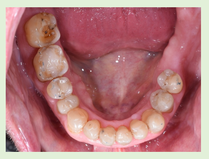
### 2. DIAGNOSTIC PHASE

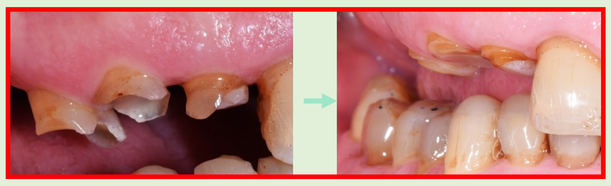
- Occlusal examination:
  - Static occlusion - **Class I** incisal relationship
  - Dynamic occlusion
    - LHS – **group function,** RHS – **group function**
    - Protrusive guidance – **UR1, LR1 | UL1, LL1**
- Load testing: [4] *Dawson 2007*
- FWS measurement: RVD 85mm, OVD 76mm, **FWS 9mm**
- Facebow record
- Centric relation (CR) record recorded using Lucia jig
- Mounted study models in CR
- Lower diagnostic wax up at 3mm increased OVD

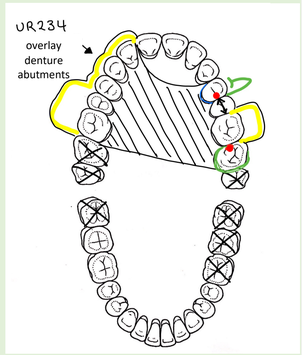


### 3. DEFINITIVE RESTORATIVE PHASE

- **NCTSL LL54321 LR12345**
  - DIRECT COMPOSITE BUILD UP RESTORATIONS
- **UR234 HEAVILY BROKEN-DOWN CORONAL TOOTH STRUCTURE**
  - **Dome and preparation of buccal margin** for ***overlay denture abutment***
- **Upper partial Co-Cr denture**





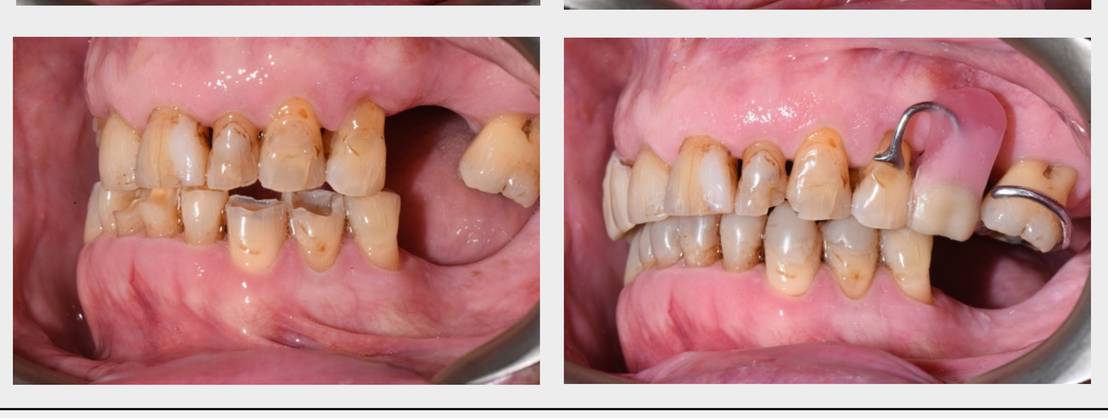



### 4. MAINTENANCE PHASE: [3] *DBOH toolkit 2021*

- Oral hygiene
- Denture hygiene
- Diet analysis and advice
- Construction of **Michigan splint**
  - Protect direct restorations
  - Prevent NCTSL at night-time

## *POST-OPERATIVE*

## *PRE-OPERATIVE* / *POST-OPERATIVE*



## DISCUSSION + REFLECTION

### NCTSL:

- LR4 - The walls of the adjacent teeth diverge inwards due to tilting and drifting, complicating a direct path of insertion for an indirect restoration for ease and predictability of cementation. [7] *O'connor and Gavriil*
- UR34 - exhibit a lack of coronal tooth structure, creating difficulty in forming adequate resistance and retention for an indirect onlay restoration. Poor long-term prognosis and unpredictable bonding for adhesive indirect onlays UR34 and the risk of debonding explained to patient. Crown lengthening, extrusion, post and core were methods of increasing crown length, which the patient did not want to undertake. [6, 9] *(Hemmings et al 2018, Goodacre et al 2001)*
- Aim achieved – to restore function and aesthetics, whilst ensuring conservation of tooth structure and addressing aetiology. [5,6,8] *Hemmings et al 2018*
- Reorganised approach anterior first, allowing patient adaptation and create sufficient interocclusal space for upper Co-Cr denture.
- Direct composite restorations – minimally invasive treatment option. [6] *Hemmings et al 2018*
- Diagnostic wax up and direct restorations ensured centric relation coincides with centric occlusion, shared anterior guidance and even bilateral occlusal contacts. [15] *Mehta et al*
- Occlusal splint can be utilised to test the patient's tolerance to increased OVD, and a vacuum formed matrix of diagnostic wax ups to provide a visual aid to the patient before definitive restorations. [8,,11] *Hemmings et al 2018, Mehta et al*
- Prevention and maintenance is imperative for long term stabilisation and management. [3,13,14] *DBOH 2021, Holbrook et al 2003, Mehta et al 2012*

### Co-Cr overlay denture

- Overlay acrylic teeth UR234 covers full labial surface of worn teeth, terminating at the gingival margin. Decreased visibility of abutment margin on smiling. [8, 10] *Hemmings et al 2018, Beyth et al*
- Increased stability, retention and indirect retention with buccal margin preparation UR234
- Preparation confined to enamel, reducing risk devitalisation UR34
- Lack of retention for the RHS saddle of upper denture can be improved with precision attachments e.g. studs / magnets / locator systems, utilising the retained roots. [15] *Williams et al*
- Patients first denture – allow for adaptation before considering precision attachment
- To have adequate stability, the amount of support and retention should be greater than the displacement factors. [12] *Davenport 2007*

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