

Treatment planning and restorative management

Brenda Baker and **David Reaney** examine treatment management in restorative dentistry

Once upon a time, the traditional model of care for patients involved the use of individual clinical expertise and experience tailored to the specific treatment needs of the patient.

The changing times have caused an evolution in the delivery of dental healthcare. The American Dental Association defines evidence-based dentistry as ‘an approach to oral healthcare that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences’ (2012).

Now, the advent of the internet has caused an explosion in the ability to access knowledge. There is so much information available that clinicians, and now patients, are becoming

overwhelmed by information and resources available online.

Evidence-based treatment planning Management overview

Any treatment plan must include short-, medium- and long-term goals (Newsome, Smales and Yip (2012). Patient history taking and clinical examination are two of the most important considerations of the assessment process.

Interdisciplinary, multidisciplinary and comprehensive treatment plans are now commonplace. These cases can be time-

consuming and patient motivation is the key (Arroyo, Bollain and Esquiú, 2012).

Several general principles have been outlined by Garavaglia, Mojon and Belser for the planning of treatment (2012):

- Improve the tooth (abutment) prognosis: retreatment options, treatment reversibility and conservation of tooth structure must be included in the context of tooth prognosis
- Utilise adhesion. Adhesion can assist with compromised retention and resistance forms and may avoid possible endodontic treatment for prosthodontic needs

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Brenda graduated from Sydney University with honours and completed a masters degree in conservative dentistry from Eastman Dental College. She has taught in the prosthetic faculty at Sydney University and pursued a preventively-oriented career in private practice. Throughout her career, Brenda has had a commitment to continuing education in a variety of disciplines including prosthodontics, periodontics and pain management, and is currently director of clinical education for Southern Cross Dental.

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TABLE 1: GLOSSARY OF THE TREATMENT MANAGEMENT PROCESS

Stage of treatment	Treatment considerations
Crisis management and stabilisation	<ul style="list-style-type: none"> • Manage acute pain and dental and soft tissue infection, eg, exodontia – tooth fracture, non-strategic teeth with hopeless prognosis, retained roots • Caries and erosion control • Assess wear and its management*
Prevention and disease control	<ul style="list-style-type: none"> • Hygiene, initial periodontal treatment and medicament implementation (fluoride, desensitisation) • Splint therapy
Initial restorative treatment	<ul style="list-style-type: none"> • Basic conservative dental procedures – core placement, relevant interdisciplinary consults
Reassessment and occlusal analysis	<ul style="list-style-type: none"> • Evaluate status of preventive and restorative treatments • Facebow with mounted study models on semi-adjustable articulator • Diagnostic wax-up of mounted study models
Comprehensive definitive restoration	<ul style="list-style-type: none"> • Define the occlusion required – work to current occlusal scheme (conformative) or reorganise? • Evaluate the vertical dimension of occlusion (VDO) • Consider interdisciplinary treatment plans to harmonise with reconstruction
Monitoring and maintenance/recall	<ul style="list-style-type: none"> • Conservative frequent recalls • Monitor periodontium, caries activity and marginal integrity of fixed prosthetics including implants

*Separate discourse on wear to follow

- Adopt a conservative approach
- Aim to segment prosthetic structures into single units and short fixed bridges, eg, a three-unit implant-supported fixed prosthesis can be redone if problems occur without jeopardising the entire case (Tan et al, 2004; Pjetursson et al, 2004; Pjetursson et al, 2008)
- A tooth-supported bridge, especially on non-vital abutments, is usually a less desirable option than a single implant to replace a missing tooth (Randow and Glantz, 1986).

These factors should be considered for dental rehabilitation specifically involving implant therapy (Sadowsky and Bedrossian, 2013):

- Patient's systemic condition – acute infections, severe anaemia/uncontrolled diabetes/ hypertension/abnormal kidney or liver function, severe haemorrhage or immunocompromised status or use of intravenous bisphosphonates
- Prevailing local factors – bone quality and quantity, gingival biotype, periodontal and restorative status of teeth, anatomic limitations
- The aesthetic success of the implant restorations is based on the correct three-dimensional position of the implant in bone
- The anterior maxillary region is often aesthetically challenging and can be made more complex with a thin biotype and high lip line (Fu, Lee and Wang, 2011). Thin biotype has been reported to be linked with 1.8mm marginal mucosal recession as opposed to thick biotype with 0.6mm recession
- Fu, Lee and Wang advised a protocol for dealing with thin biotype by use of a concave abutment and crown profile and more palatal and apical placement with a straight-walled platform using platform switching (2011).

Various patient-mediated concerns – finances, treatment time, anticipated morbidity, surgical exposure, hygiene access and maintenance will all impact upon the final treatment plan and various options should be presented.

Management of toothwear

Toothwear describes the surface loss of dental hard tissues from causes other than dental caries, trauma or as a consequence of developmental disorders (Hattab and Yassin, 2000). Normal vertical loss of enamel from physiologic wear is

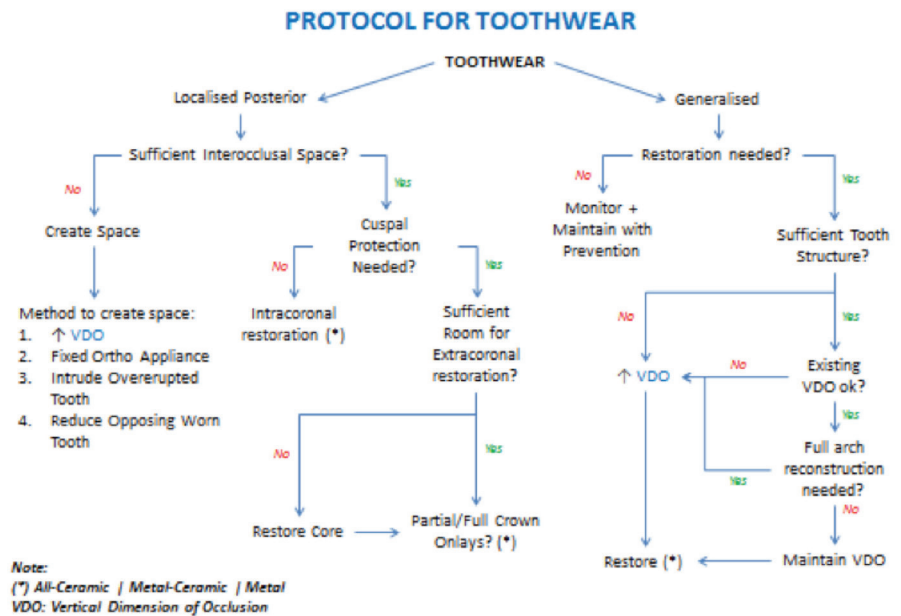


Figure 1: Protocols for toothwear

TABLE 2: SUBCLASSIFICATION OF TOOTHWEAR LESIONS

Attrition is defined as the 'physiologic wear of tooth structure due to tooth-to-tooth contact as in mastication with possible abrasive substance intervention' (Eccles, 1982). The early clinical appearance is of a small polished facet on the cusp or ridge or slight flattening of the incisal edge. The lesion's progression results in a reduced cusp height and flattening of occlusal inclined planes with dentine exposure.

Erosion is the loss of tooth surface by a chemical process not involving bacterial action. Typically, they present as bilateral concave defects. Initially, enamel is affected and progression leads to dentine exposure, which appears dull.

Abrasion is the physical wear of tooth surface through an abnormal mechanical process independent of occlusion. A full-mouth reconstruction is a treatment option for generalised toothwear but not always necessary as the dentition may still function and the patient may not have high aesthetic demands (Figure 1).

about 20-38µm/annum (Lambrechts et al, 1989). Tooth surface loss embraces all the aetiological factors regardless of whether the exact cause of wear has been identified.

Two different occlusal schemes are possible:

- **Reorganised**
 - To increase VDO when worn teeth still have adequate crown height
 - With worn teeth that are short and need restorations
 - Where no stable occlusal relationship is evident as the existing dentition is severely damaged or the patient is partially edentulous (Chu et al, 2002).

- **Conformative:** this mode of treatment is chosen to manage generalised toothwear when the coronal tissues are reasonably worn and if only some teeth need restoration. Placing a relatively small number of intra/extracoronal restorations in a moderately worn dentition with acceptable existing VDO and stable occlusal relationships simplifies treatment (Chu et al, 2002). **D**

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