Complete dentures: an update on clinical assessment and management: part 1

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Key points

- Highlights changes to the UK population and dental undergraduate teaching that may be relevant to complete denture provision.
- Provides a refresher on oral anatomy in edentate patients and potential challenges associated with anatomical factors.
- Presents simple guidance for managing patients with anatomical challenges in general dental practice.

The ability to provide high-quality complete dentures has been a key skill for general dental practitioners throughout the history of dental care. The prevalence of edentulism is becoming increasingly concentrated in an older patient cohort and general dental practitioners may more commonly face challenges associated with providing care for these patients. This two-part series explores various aspects of complete denture provision and is designed to act as a refresher on core aspects of managing these patients, while also covering common challenges associated with anatomical or patient factors. This first part will explore changes in the provision and teaching of complete denture care in the UK and will describe important aspects of patient examination. It will discuss the management of unstable lower dentures and fibrous replacement ridges. Part two will cover management of the gag reflex, tori, microstomia and copy dentures.

Introduction

The UK demonstrates a variety of general and oral health trends. The population is growing and is projected to increase from 65.6 million people in 2016 to over 74 million by 2039.[1] In addition, the population is becoming older as a result of healthcare and lifestyle improvements and this is demonstrated by a rising median age and a higher proportion of older people.[1,2] For example, the proportion of the population aged 65 and over was 15% in 1986, 18% in 2016 and is further projected to reach 24% in 2036.[1]

There are also positive trends in tooth retention and consequently a reduced prevalence of edentulism. The overall proportion of edentulous adults in England has fallen sharply from 28% in 1978 to 6% in 2009.[3] In addition, it is now unlikely that adults under 65 years will lose all their natural teeth and it is likely that edentulism will be concentrated within the oldest age groups.[3] These changes have occurred concomitantly with attitudes shifting more favourably towards tooth retention with increasing preference for restorative treatment instead of extractions and corresponding negative attitudes towards dentures.[4]

Various authors have also highlighted a reduction in complete denture teaching. In 2010, Clark *et al.* explored trends across 12 British dental schools and found considerable variation in requirements for complete denture provision before graduation, staff-student ratios on clinics and the involvement of registered specialists.[5] In 2013, Wieder *et al.* highlighted a disparity in the overall number of hours devoted to complete denture teaching across 13 UK dental schools with some schools reporting difficulty in finding suitable edentulous patients and concerns about insufficient curricular time.[6] A further study explored self-perceived levels of competency of 56 dental foundation trainee (DFT) practitioners.[7] During their undergraduate training, 56% made two to three complete dentures and 46% had no experience of the copy denture technique.[7] Only 37% of DFTs believed their undergraduate training had given them sufficient experience and confidence to offer complete dentures in practice.[7]

Although the proportion of edentate adults in the UK is small (only 6% in England in 2009), it is important to remember that this translates into approximately 2.7 million edentulous adults across England, Wales and Northern Ireland.[3] Therefore, a detailed understanding of the principles of complete denture construction remains vital in providing appropriate quality of care, particularly as a variety of factors will make the process more challenging:

- Edentulism is likely to be concentrated in the oldest age groups.[3] Prosthetic rehabilitation may be influenced by potential issues associated with accessing dental services, systemic disease, polypharmacy, and the ability to adapt to new prostheses[8]
- There remains a group of patients with heavily restored dentitions who may transition to complete dentures at an older age than their predecessors and thus may find the task of adapting to wearing removable prostheses more difficult
- Society is more likely to perceive removable prostheses negatively,[4] and individuals may have higher expectations of their treatment
- The declining levels of undergraduate complete denture teaching may result in reduced experience and confidence when

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offering complete dentures in general dental practice[5–7]
- Implant supported rehabilitation may not always be a suitable option due to general patient or local factors for example, systemic health, smoking history or availability of bone. Furthermore, the use of implants to support overdentures does not preclude the need to provide optimally designed prostheses.

Throughout the two-part series, we will discuss the principles of assessment for complete dentures and highlight different anatomical, physiological, pathological or psychological factors that can impact on complete denture construction. In addition, we will highlight a range of management strategies available within the general dental practitioner's armamentarium and suggest cases which may be more appropriate to refer to specialist services.

Patient assessment

History

A thorough history and examination will allow the dental practitioner to anticipate potential challenges with complete denture provision and determine the likelihood of success. For patients with existing dentures, it is important to elicit detailed information regarding the patient's presenting complaint. This may be supported by the Oral Health Impact Profile for edentate individuals (OHIP-EDENT); a validated survey designed to assess the impact of oral health on oral health-related quality of life in edentulous patients.[9] The presenting complaint may relate to various challenges in the construction of dentures including anatomical, clinical, technical, and patient-related factors.[10,11]

The denture-wearing history should provide information on the age of existing dentures, the frequency of denture replacement, the patient's experiences and expectations.[10] It is important to identify whether any previous dentures have been successful as it may be suitable to copy features from a previously successful set. It will be important to manage expectations for those patients with a history of denture intolerance, yet technically satisfactory prostheses.

Clinical examination

Clinical examination should fully evaluate both the patient's anatomy and previous dentures to anticipate challenges and the potential to improve upon retention, stability, support, appearance and/or other factors.[12]

Table 1 Cawood and Howell's descriptive classification of the changes of the shape of the alveolar processes of the edentulous jaws[16]

Class	Description
Class I	Dentate
Class II	Immediately post extraction
Class III	Well rounded ridge form, adequate in height and width
Class IV	Knife-edged ridge form, adequate in height and inadequate in width
Class V	Flat ridge form, inadequate in height and width
Class VI	Depressed ridge form, with some basilar loss evident

This should be undertaken in a systematic manner and would typically involve assessment of anatomy followed by an assessment of any existing dentures. This should follow a diagnostic process to determine if the patient presents with:
- Technically adequate dentures on a favourable tissue base
- Technically adequate dentures on an unfavourable tissue base
- Technically inadequate dentures on a favourable tissue base
- Technically inadequate dentures on an unfavourable tissue base.

The following aspects of the existing dentures should be assessed to identify opportunities for improvement:
- Retention
- Stability
- Support
- Adaptation to underlying tissues
- Prosthetic anatomy and underlying skeletal base
- Static and dynamic occlusal relationships.

Retention is the ability of the dentures to resist movement away from the ridge.[13] Factors which influence retention include adhesion, cohesion, gravity, tissue contact, peripheral seal and neuromuscular control.[13] The previous dentures can be assessed to determine whether they have been optimised through close adaptation to underlying tissues, appropriate surface area coverage, adequate border seal and appropriate contour to aid muscular control.

Stability refers to the denture's ability to resist to horizontal and rotational forces and hence prevent movement in the lateral or anteroposterior direction.[14] Denture instability can also impair retention and support by causing a disruption of the border seal or an incorrect relationship between the denture base and supporting tissues.[14] Stability will be influenced by ridge height and conformation, adaptation of the denture base, residual ridge relationships, occlusal balance and neuromuscular control.[14]

Support is the resistance to vertical movement of the denture base towards the ridge.[15] The previous denture should be evaluated to assess whether it is optimally extended to cover the maximal surface area without impinging on tissues likely to displace it.[15]

Adaptation to the underlying tissues should be assessed by examining the fit of the denture over support areas or at denture borders. In cases where this is difficult to assess, obtaining a wash impression with the denture *in situ* can be useful to identify areas where the prosthesis is poorly adapted to the underlying tissues. Poor adaptation may occur following resorption or where there have been errors in the construction process for example, distortion of impression materials or denture bases.

Prosthetic anatomy can significantly influence the success of a complete denture. The incisor relationship should be assessed in light of the underlying skeletal base. This is important as it may not always be possible to achieve a class 1 incisor relationship particularly in cases of severe skeletal discrepancies. The position of the denture teeth is also important particularly for the mandibular arch where the teeth should be set over the ridge. The condition of the denture teeth should be evaluated as wear of the denture teeth may contribute to changes in the vertical dimension and freeway space. Significant changes in the vertical dimension of new complete dentures may not always be tolerated, especially when a particularly worn set of complete dentures have been utilised for many years.

Static and dynamic occlusal relationships can be difficult to evaluate accurately. Patients may attend complaining of denture discomfort

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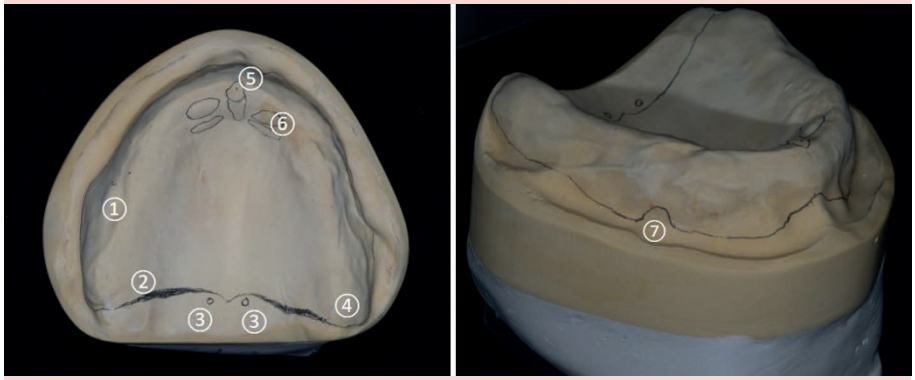
Fig. 1 Maxillary anatomic landmarks of interest and an outline of the denture base



Number	Description
1	Palatal gingival remnant: the remnant of the gingival margin on the palatal side of the dental arch which remains visible as a cordlike elevation.[20] This landmark can be used as a guide for location of the artificial teeth
2	Site of the post dam for maximum posterior extension: this should be positioned on the compressible tissue just anterior to the vibrating line.[18] It should extend anterior to the fovea palatini in the midline and be wider and deeper in the darker regions lateral to this point
3	Fovea palatini: two small depressions in the mucosa on either side of the midline.[18] These are the orifices of common collecting ducts of minor palatine salivary glands
4	Maxillary tuberosity: a rounded eminence that should be encompassed by the denture base. The hamular notch (mucosal depression posterior to the tuberosity) marks the posterior limit of the denture extension in this region[18]
5	Incisive papilla: a soft pad of tissue that overlies the incisive canal.[18] The labial surfaces of the central incisors lie approximately 10 mm anterior to the centre of the papilla
6	Palatal rugae: irregular transverse mucosal ridges in the anterior hard palate.[18]
7	Fraenum: folds of mucous membrane containing fibrous mucosa. The denture borders should be sufficiently relieved in these areas[18]

when eating, either from localised areas of the edentate ridge or from the muscles of mastication. Occasionally this may be the result of a premature contact or an RCP-ICP slide. In these cases it may be useful to evaluate the patient's arc of closure both with and without the dentures *in situ*. In some cases mandibular movement may be influenced by denture design and discomfort, while in others it may represent habitual closure.

Identifying previous failures and existing challenges to the construction of complete dentures is pertinent to the treatment planning and consent processes. Indeed, there may be cases where it is not possible to meet the patient's expectations. The diagnostic process outlined here informs clinicians of the potential outcomes of treatment, and thus enables realistic expectations to be set before undertaking treatment.

Anatomy of the denture bearing area

An understanding of the anatomy of the oral tissues is essential to the construction of successful dentures and the anatomic landmarks of interest are indicated on Figures 1 and 2.

The ridge form can significantly impact on the available denture bearing area. Morphological studies have shown that the shape of the basal bone remains relatively stable following tooth loss.[16] However, the shape of the alveolar processes changes significantly with a variable pattern of bone loss across different sites.[16] In the anterior mandible, bone is lost vertically and horizontally (from the labial aspect) whereas in the posterior mandible, the bone loss is mainly vertical.[16] In the maxilla, bone loss is both vertical and horizontal (from the labial or buccal aspect).[16]

In 1963, Atwood classified the mandibular anterior residual ridge form into six orders.[17] Cawood and Howell later developed a descriptive classification of the changes of the shape of the alveolar processes of the mandible and maxilla.[16] This served to simplify the description of the alveolar ridge and aid both communication between clinicians and treatment planning (Table 1).

Maxillary denture anatomy

Supporting tissues

The success of a maxillary denture can be influenced by the quality of the supporting tissues. The ridge form, dimension, contour and consistency of the overlying soft tissues are important to consider. For example, wide and shallow palatal architecture with a shallow sulcus depth will be challenging when attempting to improve denture stability. Furthermore, the contour and consistency of the supporting tissues may significantly influence the treatment planning for example, in the case of fibrous replacement ridge or palatal tori. The primary supporting areas for a maxillary denture are the hard palate (influenced by the slope, width, consistency, displaceability and contour of the tissues) and the posterolateral aspects of the residual alveolar ridge. The secondary supporting areas are the rugae, maxillary tuberosity and alveolar tubercle.

Border extension

The master impression should capture the functional sulcus depth and width (Fig. 1) and can be captured with either the patient's functional movements or the clinician's border moulding. Clinician border moulding may result in under-extended denture bases if excessive force is used when stretching the buccal or labial tissues. The maxillary denture should rest short of the functional sulcus depth to improve comfort and prevent dislodgement of the prosthesis during function.[13] The denture borders should also be relieved at the labial and buccal frenal attachments as dictated by the patient's functional movements.

The posterior extension of the maxillary denture is determined by the junction of the hard and soft palate and adjacent anatomy (Fig. 1). The post-dam should adopt a cupid's bow shape in the antero-posterior dimension and incorporate a vertical extension of acrylic known as a posterior palatal seal.[18] The post dam should be seated on non-moving tissue to prevent loss of border seal during function, extend from each hamular notch and sit slightly anterior to the

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Fig. 2 Mandibular landmarks of interest and an outline of the denture base a) Atwood Class III mandibular ridge. b & c) Atwood Class IV mandibular ridge

Number	Description
1	Fraenum: folds of mucous membrane containing fibrous mucosa. The denture borders should be sufficiently relieved in these areas[18]
2	Lingual frenum: the denture extends up to this point
3	Retromolar pad: a movable mass of tissue consisting of non-keratinised mucosa.[18] The denture base will typically extend onto the lower half to two-thirds of the retromolar pad. The pear shaped pad lies anterior to this and is formed by scarring following extraction of the most posterior molar.[18] This will be covered by the denture and will offer support and resistance to posterior displacement[18]
4	Someya sinew string: a frenum like anatomical variant of the buccal mucosa at the buccal root of the retromolar pad which should be relieved[21]
5	Salivary duct openings: the denture border should avoid this area
6	Bony prominences associated with the mentalis muscle attachment: often more evident in severely resorbed cases
7	Superficial mental nerve: indicated by prominences overlying severely resorbed ridges. The denture may need to be relieved in this area
8	Mylohyoid ridge: the mylohyoid muscle attaches to this bony ridge.[18] The denture border should extend up to this
9	Buccal shelf: important support area which lies between the crest of the residual ridge and external oblique ridge of the mandible[18]

fovea palatini in the midline. To account for the differential compressibility and mobility of the tissues, the post dam should be both narrowest and thinnest in the midline and hamular notch regions, and wider and deeper in between.

Polished surface contour

The polished surfaces of a maxillary denture are determined by the master impression and wax rims and should facilitate maintenance of the border seal by providing adequate soft tissue support. During impression taking, the patient should be asked to open wide and make protrusive and lateral border movements of the mandible to prevent the denture from impinging on the coronoid process. The maxillary wax rim can be based on anatomic norms and is usually 22 mm high in the midline and 5 mm high in the hamular notch region. It is normally 3 mm wide anteriorly and 7 mm wide posteriorly. It usually extends 8–10 mm anterior to the centre of the incisive papilla and 12 mm lateral to the gingival remnant in the molar region[19] (a remnant of the gingival margin on the palatal side of the dental arch which remains visible as a cordlike elevation).[20]

Mandibular denture anatomy

Supporting tissues

The mandibular supporting tissues should be assessed similarly to those for the maxillary denture. The primary supporting tissues for a mandibular denture are the residual alveolar ridge and the buccal shelf.[18] It is important to recognise the true extent of available supporting tissue as muscle activity may limit border extension and thus may reduce the potential surface area available to support a denture. A mandibular complete denture should be appropriately extended to utilise all the available anatomy to prevent dislodgement during function. This includes extension over the lower half to two-thirds of the retromolar pad.

Border extension

Border extension is influenced by muscles of the tongue, buccinator, mylohyoid, masseter, orbicularis oris and mentalis. Therefore, all of these should be activated during border moulding or neutral zone impressions. The anatomic landmarks of interest are indicated in Figure 2 which guide the denture borders.

The distolingual extension should be determined by the retromylohyoid fossa. This is posterior to the mylohyoid muscle. The denture base should be closely adapted to the lingual

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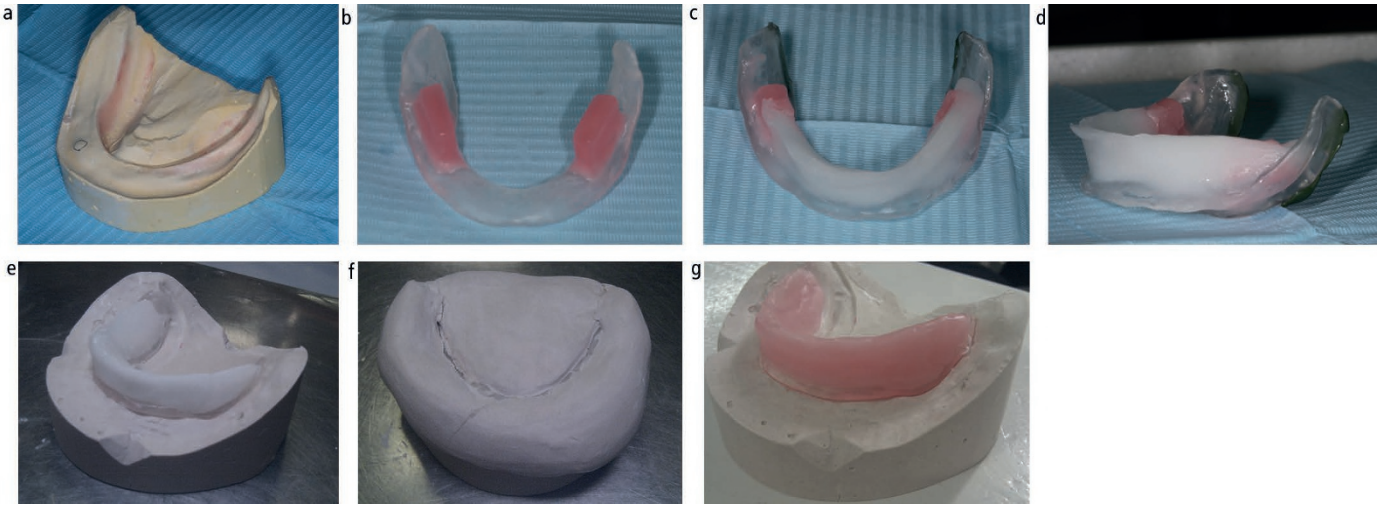

Fig. 3 Piezography (a) Severely resorbed edentate ridge (Atwood class VI). b) Small wax pillars used to record the occlusal vertical dimension. (c & d) Denture conditioner (Viscogel, Denstply, Weybridge, UK) was utilised to record the functional impression. Note the excess material overlaying the adjusted wax pillars which may have inadvertently increased the vertical dimension. (e, f and g) The record was converted into a wax rim utilising plaster masks and this represents the shape dictated by the piezograph

tissue in this region and should be limited in its posterior extension by the retromylohyoid curtain. Overextension in this region will cause the denture to displace anteriorly on protrusion of the tongue and may result in soreness during swallowing and denture displacement during function. Border extension should be determined by the functional sulcus depth while the tongue is placed against the anterior aspect of the upper ridge. The lingual extension should be dictated by the depth of the sulcus and the mobility and displaceability of the tissues of the floor of mouth. Border movements involving raising the tongue against the palate and moving the tongue over the impression tray from side to side enable accurate recording of the functional sulcus depth and width in this region. This will also facilitate accurate recording of lingual frenal mobility and enable appropriate relief.

The labial and buccal contours are determined by the muscles of facial expression. Their activity can be gained by asking the patient to make 'ee' and 'oo' sounds during impression taking. The disto-buccal extension should provide sufficient space for buccinator activity, while also enabling the buccal tissues to rest over the polished surface and maintain the border seal. This is gained by gently border moulding through compression of the patient's cheeks. Maximising extension of denture bases within these limits is important as the border extension can significantly dictate the available support.[15]

The denture should cover half to two-thirds of the retromolar pad and should extend just beyond the buccal-tongue contact point (BTC point).[21] This area resists distally displacing forces while also helping to maintain a border seal.

Polished surface contour

The polished surface of a mandibular complete denture should conform to the denture space. This is discussed further in the management of unstable mandibular dentures section.

Unstable mandibular dentures

Introduction

Patients often complain of difficulty managing mandibular complete dentures.[22] Mandibular dentures must utilise the available supporting tissues to resist functional forces, however, this may be limited in cases with atrophic ridges.[23] Mandibular dentures should be designed to maximise surface area and retention, be in harmony with the neutral zone, and enable the soft tissues to provide a border seal. Thus, the contour of the denture and set up of the denture teeth must be reliably positioned to lie within the denture space. There are many different techniques to achieve this, some of which are discussed in the denture anatomy section.

Management

General principles

Denture stability must be considered from the outset. Both primary and master impressions should be accurate and correctly extended into the functional sulcus before proceeding with subsequent stages. An assessment of anticipated denture stability can be made during the wax rim stage.[24] The majority of mandibular wax rims should sit over the alveolar ridge with limited labial extension. The rim may have a horizontal depression to accommodate the mentalis muscle and may need to adopt a retroclined profile in extreme cases. The lingual contour should not impinge on the tongue space. The distobuccal contour should facilitate natural positioning of the buccal tissues and often adopts a slight concave profile. The canine and premolar region may need to be set with a lingual inclination, while remaining centred over the alveolar ridge, to provide sufficient space for muscle activity. These factors become increasingly critical as an edentate ridge becomes more resorbed.

Neutral zone impressions

In cases where the edentate ridge has a smaller profile, adequate denture contour may be difficult to achieve and may benefit from a neutral zone impression or a 'piezography' technique.[24] When initially described, this involved the use of soft wax or compound to capture the 'dead space' between the patient's functional and supporting tissues.[25]

A more commonly utilised technique for neutral zone impressions involves using a clear mandibular base plate with small fins of wax to set the vertical dimension (Fig. 3).[26] This is similar to a Manchester wax rim (a mandibular

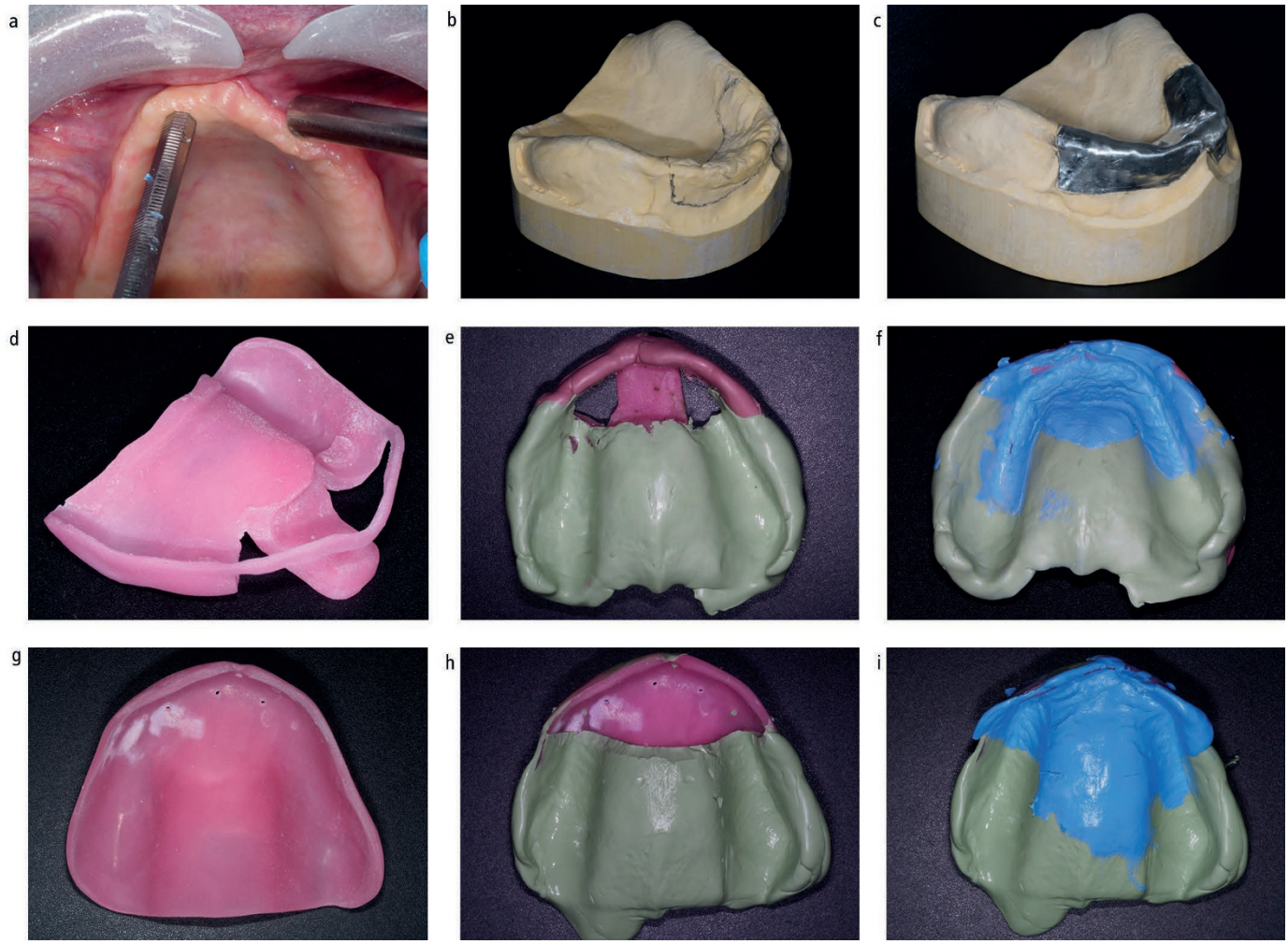

Fig. 4 Impression techniques for fibrous replacement ridges (FRR). a) FRR affecting the upper anterior segment. b) The FRR was indicated on the primary cast. c) Burnished foil achieved relief of the fibrous replacement ridge on the master cast. d) A windowed tray used for impression taking. e) Border moulding completed before obtaining a definitive impression over the posterior denture bearing area. f) The impression was gently reseated and light body silicone impression material was syringed through the window over the displaceable ridge. g) Example of a selectively displacive impression technique in a tray with perforations anteriorly. h) Localised medium body silicone was utilised posteriorly followed by i) a light body wash impression over the displaceable tissues

wax rim comprising bilateral pillars of wax in the molar regions) although the piezography baseplate may also include an anterior wire for retaining impression material.[27]

The process involves first adjusting the maxillary wax rim in the usual way ensuring adequate support for the muscles of facial expression. The mandibular base plate is then assessed for stability and correct border extension. The wax pillars in the mandibular molar regions are adjusted to the correct vertical dimension. The lingual and buccal extension of the wax pillars are adjusted to prevent encroachment beyond the neutral zone. The mandibular base plate is then reseated with a soft material such as a denture conditioner (Viscogel, Denstply, Weybridge, UK) overlying the anterior part of the rim between the two pillars. The volume of the material should conform to the dimensions set by the wax pillars as excessive material may displace the functional tissues. The patient should be encouraged to sip water, utilise muscles of facial expression by saying 'ee' and 'oo', and to speak utilising a range of vocal sounds.[28] The associated muscle activity will shape the material as it sets. Alternative techniques utilise denture soft lining material or silicone impression material.[29]

The dental laboratory will convert the record into a wax rim by creating palatal and lingual plaster masks, removing the piezograph and adding molten wax. At a subsequent clinical visit, the stability of the wax rim is confirmed and an interocclusal record is obtained at the correct vertical dimension. It should be noted that this treatment process can be technique sensitive and guidance is recommended when first undertaken.

Summary

The management of unstable mandibular dentures can be especially challenging and necessitates scrupulous adherence to principles of denture design and provision. These presentations are expected to persist given the changes expected in the UK population over the coming decades. It is important to note that in some cases it may not be possible to create a stable denture. If the patient is still struggling with a fully optimised denture, then an implant-supported prosthesis may be the only solution depending upon general principles of assessment for dental implants.

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Fibrous Replacement Ridge

Introduction

Fibrous replacement ridge (FRR) is an area of mobile soft tissue affecting the maxillary or mandibular alveolar ridges and may also be referred to as a 'fibrous ridge', 'fibrous displaceable ridge' or 'flabby ridge'. It develops when hyperplastic soft tissue replaces the alveolar bone and is most commonly described as affecting the anterior maxillary alveolus.[30] It is reported that up to 24% of edentate maxillae and 5% of edentate mandibles may exhibit some component of fibrous replacement,[30] however, the reliability and validity the measures used to assess fibrous replacement have never been formally investigated. It is also reported that some presentations of displaceable ridge may represent normal anatomy or other physiological changes.[31–33]

There appears to be a lack of evidence to enable classification of FRR from either an anatomic or clinical perspective, however, its integration into syndromic presentations is well described.[34,35] Kelly first described 'combination syndrome' based on observations of six patients.[35] Each patient wore a maxillary complete denture opposed by natural teeth and a distal extension mandibular partial denture. Kelly noted common presentations including alveolar resorption of the anterior maxilla, enlargement of maxillary tuberosities and resorption underlying the denture bases in the mandible. The term 'combination syndrome' is less commonly used nowadays as the features often do not present simultaneously.

Palmqvist *et al.* in 2003 reported a lack of evidence to support a causative mechanism for resorption in the anterior maxilla as a result of the presence of anterior teeth in the mandibular arch.[36] The available literature represents opinion based on observations of a small number of patients, rather than rigorous scientific investigation. The aetiology of FRR therefore remains unknown.

Management

The success of a complete denture is based on its ability to fulfil basic principles relating to support, stability and retention. This can be difficult to achieve in cases of FRR as the underlying tissues are unstable and do not provide high quality support. This may secondarily compromise the ability of the dentures to maintain a border seal. There are 3 main approaches to the management of a fibrous replacement ridge: conventional rehabilitation utilising a variety of impression techniques; implant support rehabilitation; or more rarely surgical removal of fibrous tissue.

Conventional rehabilitation and impression techniques

There is varying clinical opinion on the most appropriate impression technique for FRRs. Various mucocompressive, selective pressure or mucostatic impression techniques have been suggested. The ideal situation would involve either an evenly distorted mucocompressive impression or an undistorted mucostatic impression. Both can be challenging to achieve as all impressions carry an undesirable risk of unintentionally distorting the tissues.

Mucocompressive techniques have been described to record a FRR compressed in a controlled fashion. It is important to consider how uncontrolled displacement of the FRR will be prevented. Perhaps the simplest technique involves the use of a special tray with perforations in the region of displaceable tissue. This is only suitable for mild cases as it only arbitrarily accounts for the displaceable tissue.

Selective pressure and window techniques aim to exert pressure over unaffected tissues while taking a relatively mucostatic impression of the displaceable tissues. This typically involves a two-stage procedure where a conventional impression is first taken of the arch. The impression material is cut away in the region in of FRR, the tray is perforated and a relatively mucostatic impression material is then syringed over the ridge.[30] Alternatively, a window can be cut into the special tray prior to taking the first impression (Fig. 4).[37] Both techniques facilitate controlled compression of the FRR when compared to a classical mucocompressive technique, however, care should be taken not to over-compress the unaffected tissues during the second stage.[37]

Mucostatic impressions aim to record the denture bearing area while at rest. This typically involves carefully applying a self-supporting mucostatic impression material (for example, impression plaster) over the tissues of interest. This technique captures the displaceable tissues in a relatively mucostatic manner. The unaffected tissues should provide adequate support for the denture base to resist excessive deformation of fibrous regions. However, denture displacement may occur during function due to the differential stability of the underlying tissues, particularly if the FRR is extensive or if the unaffected tissues exhibit high compressibility. Mucostatic impression techniques utilising self-supporting material are rarely used in modern practice.

Implant-supported rehabilitation

Implant-supported rehabilitation is sometimes advocated for patients with FRR. The basic principles of patient assessment for dental implants will apply and pre-surgical assessment of bone volume remains paramount. The long-term maintenance and prognosis of any fixtures should be considered as a very deep fibrous tissue collar may impede effective restoration and cleansability. Some cases may require excision of fibrous tissue either concomitantly or as an additional surgical procedure.

Surgical removal of fibrous tissue

Surgical removal of fibrous tissue has been described in the literature and aims to provide stable tissues for complete denture provision.[30] This procedure has the disadvantages of reducing the available tissue for denture support and decreasing the sulcus depth in the region of resection. For these reasons, surgical intervention is rarely used nowadays. Therefore, this approach should only be considered after conventional prostheses have been fully optimised. Referral to specialist services is recommended for further assessment and treatment planning.

Summary

The prosthetic rehabilitation of patients with FRR continues to present significant clinical challenges, particularly in advanced cases. The effective management of these patients should be based on careful assessment and planning. The magnitude to which the displaceable tissues will affect the retention, support and stability of the definitive prosthesis should be considered. While there are numerous reported techniques, there is a lack of consensus on the most appropriate strategy for patients with FRR. Impression techniques should be selected that will optimise the peripheral seal.

Conclusion

Although the proportion of edentate adults is declining, there are still a vast number of patients who will require complete dentures. Prosthetic rehabilitation remains challenging due to a variety of general health, sociocultural and oral health factors. Therefore, a detailed understanding of the principles of complete denture construction remains

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vital in providing appropriate quality of care for patients. The purpose of this first paper was to provide an overview of the principles of assessment for complete dentures and to discuss the management of common problems for example, unstable dentures and fibrous replacement ridges. The second article will provide an update on copy denture technique, and approaches for managing gagging, maxillary and mandibular tori and reduced oral apertures.

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