The benefits of VPS

VPS – a versatile and clinically highly satisfactory medium for implant-assisted overdentures and three-dimensional clinical modelling:

Abstracted by Dr Justin Stewart

The most usual way of treating patients with teeth missing in some or all of their jaws has for some time been to furnish the patient with either complete maxillary or mandibular dentures.

Unfortunately, while most patients express satisfaction with their maxillary complete dentures, in practice mandibular complete dentures tend to produce more problems than many dentists are used to supporting, and many patients who lose teeth as a result of injury or surgery also present with problems.

The implant-supported options are far superior as regards comfort and function. The question is, what can be done to improve this situation for patients?

In many cases, a better alternative to mandibular complete dentures is the use of endosseous implants that benefit from the advantages implants offer assistant to support, stability and retention of removable prostheses. The availability of the implant option in dentistry is yet another example of how implant technology has evolved.

Dentures need to be made to the highest possible standard: before making this, it is necessary to place the impression of the dental arch, selecting the appropriate stock impression tray and making tray adaptations to existing acrylic contours.

The preferred treatment

In practice, implant-assisted overdentures are generally the preferred treatment when a patient is missing several teeth adjacent to one another and seeks a solution that offers maximum comfort, convenience and functionality. Usually the only cases where this solution would not be recommended would be if there were surgical or other clinical concerns, or if there were a question of affordability; implant-assisted overdentures being more expensive than mandibular complete dentures.

After conducting a thorough, evidence-based review of existing information, a recent systematic review at McGill University found that the restoration of the edentulous mandible with conventional dentures was no longer the most appropriate first-choice prosthetic treatment, and that there was now over-whelming evidence that overdentures founded on implants deserve to become the first choice of treatment for the edentulous mandible.1

The implant-supported restorations must be as accurate as feasible to bring patients maximum satisfaction. A vital part of ensuring accuracy is to make impressions of the oral structures and implant, this need arises early in the prosthodontic treatment.

Without accurate and precise impression procedures and cast-forming processes, making accurate restorations is nearly impossible. Moreover, to date there has been only limited research in this area of treatment, and the available research is unfortunately limited by inadequate measurement technology, conceptually limited protocols, and mixed results. Getting accurate impressions from the outset is particularly important if the dental practitioner is to have the maximum chance of a successful outcome.

A vital task

Vinyl polysiloxane (VPS) impression materials are suited for this vital task of obtaining an accurate registration of denture-bearing tissue and peripheral anatomy and for the accurate three-dimensional recording of dental implant positions and individual implant trajectories. Among the key elements of the VPS implant overdenture impression technique are:

- overdenture attachment selection: a minimal number of implants (typically 2-4) may be used to support, stabilise and retain overdentures.
- tray selection and adaptation: this primarily involves examining the dimensions of the dental arch, selecting the appropriate stock impression tray, and making tray adaptations to existing acrylic contours.

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Replacing missing dentition

To replace the function of the edentulous dentition and also associated supporting structures, inaccurate denture tooth positioning and physiologically unacceptable denture base contour and/or volume may result in compromised phonetics, inefficient tongue posture and function, and hyperactive gagging.2

In practice, VPS performs well as an external impression material and also as a three-dimensional disclosing material that allows denture tooth positioning and physiologically unacceptable denture base contour and/or volume to be adjusted. A vital part of the patient’s physical and psychological well-being is dependent on obtaining a successful impression: before making this, it is necessary to place the impression of the lingual flanges into the patient’s mouth several times. Tray stops: to make the best impression of the area under treatment, it is usually necessary to place the impression tray in the patient’s mouth several times. Tray stops allow consistent and repeatable tray placements to be achieved.

Border molding: this is accomplished by dispensing a ‘rope’ of medium-viscosity VPS along the peripheral tray borders.

Making the definitive impression: before making this, it is particularly important to examine the soft-tissue conditions across the denture-bearing tissue of the mandible, while keeping in mind the location of primary denture-bearing areas. It is also important, when making the impression, to use VPS of different viscosities to correspond with relative tissue conditions. For example, low-viscosity VPS should be used along ridge areas that have firmly attached tissue, and extra-low viscosity employed in areas of flabby or mobile tissue. Low-viscosity VPS should also be used around the implant attachment impression coping.

It is also important to be aware of the use of VPS as a three-dimensional disclosing material.

Communication issues

In one particular case, a new patient came to a dental practice having worn his complete new dentures for three weeks. He enjoyed reasonable function with his new prostheses, but he complained of a small but annoying raised ridge of his mandibular denture when he was talking. The patient reported that this lifting of the mandibular denture also took place during chewing and had led to an accumulation of food debris under the denture. An examination of the patient revealed a clinically acceptable level of occlusion and no denture-associated soft-tissue ulcerations.

Further examination, however, revealed the over-extension of the lingual flanges into the retromolar pad spaces, and that this was a possible etiologic factor. To investigate the matter further, diagnostic external impressions were made of the lingual flanges of the mandibular denture. The disclosing materials used for this procedure were low-viscosity and extra-low-viscosity VPS impression materials.

Overall, VPS performs well during the fabrication of implant overdentures and for the diagnostic evaluation and adjustment of all removable dental prostheses. The main reasons why VPS is such a satisfactory material for these applications are:

- the breadth of the viscosities it offers
- the convenience of the working times that apply to it
- its elasticity
- its tear strength
- its acceptable level of hydrophilicity
- its biocompatibility
- its reasonable taste and smell.

The use of VPS, and the successfully tried and tested methods of using in the applications described here, mean that its use can be successfully incorporated into any dental practice that involves the management of patients with removable prostheses.

A complete list of references is available upon request.

About the author

Justin Stewart was the first qualified Biofunctional Prosthetic System (BPS) practitioner in the UK. He is a member of the American Prosthetic Society and the British Society for the Study of Prosthetic Dentistry. Dr Stewart has recently been appointed to Dr Joe Massad’s International Advisory Board. An experienced lecturer, Dr Stewart is dedicated to resolving denture-related problems through teaching and training.