Advanced Restorative Techniques and the Full Mouth Reconstruction. Vertical Dimension And Changes During Restorative Treatment. Part 5

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Introduction

Changes in vertical dimension are often required for either gaining restorative space during restorative procedures or for improving facial aesthetics. Occlusal splints are used to first verify that the increase in vertical dimension can be tolerated and this is easily accomplished in most cases as long as this increase is done around RAP or Centrelax so that the condyles are in their most relaxed, bone braced and reproducible position. Increases and decreases in vertical dimension will be discussed showing positive changes in facial aesthetics as treatment is completed.

Increasing VDO

There is some debate among professionals as to what constitutes the need to open VDO (vertical dimension of occlusion) in the restoration of anterior teeth or partial or full mouth reconstruction. In most cases, clinicians look to alter vertical dimension for one or all of the following reasons:

- To gain space for the restoration of the teeth, to improve aesthetics, to correct occlusal relationships.
- Understanding what determines the VDO and what the effects of altering it have on the temporomandibular joint (TMJ), muscle comfort, bite force, speech, and long-term occlusal stability are prerequisites to restoring the worn dentition.
- To improve facial aesthetics in taking a long-term view on the patient’s appearance. A reduction in vertical dimension can also have a positive effect in facial aesthetics in taking a long, thin face and making it look more in proportion. However a word of warning. While increases in vertical dimension can be tried out without any tooth destruction with an occlusal splint, a reduction cannot be tried out prior to tooth preparation and its effects are irreversible. A great deal of experience is required before taking on a case such as this.

Case Study 1

A full mouth reconstruction was referred to us by her General Dental Practitioner for a full mouth reconstruction because of the poor aesthetics of her upper crowns (Fig 2) and she wanted an improvement of her smile (Fig 4).

As part of the initial diagnostics, an assessment was made of her vertical facial height by using an intra-oral face and wax jaw registration as described in article no. 3 (Figs 5 and 6) followed by a diagnostic wax-up at the increased vertical dimension (Figs 7 and 8).

Her anterior teeth showed severe wear in the lower and poor width/length ratio of her upper crowns (Fig 9) together with a centre line shift of approximately 3 mm showing true anterior contacts after a planned posterior occlusal adjustment (reduction in vertical dimension) will result in anterior occlusal stability are prerequisites to restoring the worn dentition. The following case study will show how occlusal adjustment can improve patient comfort. A reduction in vertical dimension can also have a positive effect in facial aesthetics in taking a long, thin face and making it look more in proportion. However a word of warning. While increases in vertical dimension can be tried out without any tooth destruction with an occlusal splint, a reduction cannot be tried out prior to tooth preparation and its effects are irreversible. A great deal of experience is required before taking on a case such as this.

Case Study 2

This lady was referred to me because of her failing upper anterior com-

sections as per the previous article.

The stages in full mouth reconstruction were followed as in article no. 3 of the series and the final result can be seen in Figs 15-19 showing a facel lift improvement, and a younger looking patient.

Reduction of VDO

Conversely, although not as predictable as a reduction in vertical dimension is both possible and often advisable. It cases where there may be an overall anterior open bite, a simple posterior occlusal adjustment (reduction in vertical dimension) will result in a more even manner (Figs 25-27), further reducing VDO by 2 mm (Figs 28-30).

Full diagnostic procedures were then performed including diagnostic wax-ups to this new reduced VDO (Fig 31, 32) and the patient was prepared for upper denture bonded crowns (Fig 33) and upper and lower posterior porcelain fused to metal crowns. The patient was prepared for upper denture bonded crowns (Fig 33) and upper and lower posterior porcelain fused to metal crowns. The patient was prepared for upper denture bonded crowns (Fig 33) and upper and lower posterior porcelain fused to metal crowns. Note the patient’s lower anterior teeth were not restored but only whitened. Silver discs (Fig 34) were used by the technician for fabrication of the final dentine bonded crown.

Space

When starting from retruded axis position, opening of the anterior teeth by 3 mm will yield a posterior separation of approximately 1 mm and stretch the maximus muscle length approximately 1 mm. If the condyles are not in retruded axis positions and are subsequently seated to a more superior position, every millimeter of vertical seating will reduce the maxilimus muscle length by 1 mm, thereby eliminating the need for a true opening of vertical dimension.

Fig 1. Patient’s initial full face

Fig 2. Upper anterior teeth showing centre line shift

Fig 3. Lower worn anterior teeth

Fig 4. Presenting smile with centre line shift

Fig 5. Full face cast mouth

Fig 6. Full face cast mouth with increase of 5 mm in VDO

Fig 7. Upper diagnostic wax-up

Fig 8. Lower diagnostic wax-up

Fig 9. Poor width/length ratio of the upper teeth

Fig 10. Upper teeth after crown lengthening

Fig 11. Prep guide when prepping upper anterior teeth

Fig 12. Prep guide when prepping lower anterior teeth

Fig 13. Prep guide when prepping lower teeth

Fig 14. Lower tooth preps

Fig 15. Final upper anterior crowns

Fig 16. Final lower crowns

Fig 17. Upper restored arch – occlusal view

Fig 18. Final smile close up

Fig 19. Final full face smile showing increase in VDO and younger appearance

Fig 20. Initial presenting smile

Fig 21. Edge-to-edge occlusion in ICP
upper anterior crowns (Fig 35). The final restorations show better overjet and overbite with anterior guidance now on the anterior teeth and full interdigitation of all teeth around RAP, and no slide between RCP and ICP (co-incident position) (Fig 36). Careful post restorative adjustment was performed after fitting of the crowns and a post restorative splint fabricated, for night-time use Figs 37, 38. The final smile shows the aesthetic improvements (Figs 39, 40).

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