The means of determining the Vertical Occlusion Dimension

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I. Introduction

The vertical dimension is defined as "the distance between two selected anatomical or marked points (generally one on the tip of the nose and the other on the chin), one on a fixed member and the other on a mobile member (Glossary of terms used in prosthodontics, 2005). The vertical dimension is established in occlusion (DVO) and at rest (VDR). In occlusion, it is when the teeth are in intercubidation (IC). During life, changes in dentition can lead to changes in VDO (missing or incorrectly positioned teeth) and, generally, these changes cause some loss in VDO. It is therefore an accepted standard, during the manufacture of removable or fixed complete prostheses or during the rehabilitation of a partially edentulous individual with severe tooth positions, that one of the first stages of patient rehabilitation is Establishment of a correct DVO. Different methods and techniques have been suggested to restore the original DVO or define a treatment. The purpose of this literature review is to summarize the methods and techniques studied from the early 1950s to the present, applicable to dentate and toothless patients.

II. Méthodologie

This literature review evaluated and compared studies on techniques for establishing DVO in dentate and toothless patients. A search in PubMed databases was performed and limited to articles in English published between 1951 and 2018 using the words meshes VDO, prosthodontic, determination. All references in selected articles have been filtered for additional publications. Among the articles included, classical studies on the determination of VDO using the methods of pre-existing recordings or prostheses, phonetics, aesthetics, physiological rest position, swallowing, various craniometric measurements, radiographic images and neuromuscular records were selected.

III. Results and discussion

A summary with a description, advantages and disadvantages of the techniques is presented in Table 1. Due to certain technical limitations, it is suggested to use a combination with other methods to complete the assessment of DVO. Most of the techniques are applicable clinically, with the exception of neuromuscular and radiographic techniques, which require additional equipment. Craniofacial techniques are still offered until today. In addition, devices to better establish the rest position, such as that proposed by Makzoumé, were proposed this year.
<table>
<thead>
<tr>
<th>Technic</th>
<th>Description</th>
<th>Advantage</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>Use of old dentures⁴,⁵</td>
<td>• Evaluation of old diagnostic models</td>
<td>Defines a basic record</td>
<td>Old diagnoses may be inaccessible. Photographs had to be taken before preexisting prosthetic teeth may be worn or have inadequate DVO</td>
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<tr>
<td></td>
<td>• Photographs</td>
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<td></td>
<td>• pre-existing prostheses</td>
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<tr>
<td>Phonetic⁶,⁷</td>
<td>Sound S to measure whistling space</td>
<td>Reproducible</td>
<td>Variable results for patients with class II and III malocclusions. More efficient for the production of full dentures</td>
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<td></td>
<td>• Its F to locate the incisal edges of the maxillary teeth</td>
<td>Indicates position of incisors</td>
<td></td>
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<tr>
<td></td>
<td>• Sound M to locate the mandible in the rest position</td>
<td>Relationship of the lower lip with the incisors</td>
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<tr>
<td>Esthetic⁸,⁹,¹⁰</td>
<td>Harmonious aesthetics of the lower floor of the face compared to the other floors</td>
<td>Reproducible</td>
<td>Patients with poor skin tone. The absorbed ridges with prostheses prevent any restoration of the lip contour. &quot;Breathing&quot; patients. Patients with varying degrees of incompetence lip morphology.</td>
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<tr>
<td></td>
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<td>Simple</td>
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<td></td>
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<td>Applicable on young subject with good muscle tone</td>
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<td>Physiological rest</td>
<td>Mandibular position at rest</td>
<td>Ensures the recovery of the incisors</td>
<td>Minor muscle tension will result in inaccurate measurements. Recommended combination with other methods.</td>
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<td>position¹¹,¹²</td>
<td></td>
<td></td>
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<td>Swallowing¹³,¹⁴</td>
<td>Mandibular position involves acceptance of DVO and centered relationship</td>
<td>Reproducible for dentate and toothless patients</td>
<td>Recommended combination with other methods.</td>
</tr>
<tr>
<td>Cranial measure</td>
<td>Use of facial cranio measurement</td>
<td>Simple technique</td>
<td>Recommended combination with other methods.</td>
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<tr>
<td>Craniometric¹⁰,¹⁵</td>
<td></td>
<td>Applicable in clinic</td>
<td></td>
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<td>Radiographic¹⁶,¹⁴,¹⁷</td>
<td>Cephalometric measurement of the mandibular position relative to the facial craniofacial</td>
<td>Very common and reproducible</td>
<td>Indicates an incisive dental relationship. Controlled adjustment is mandatory. Additional equipment. Irradiation.</td>
</tr>
</tbody>
</table>
Neuromuscular activity 18,19,20,21,22
Electromyographic recording of muscle activity with minimal activity in the rest position.

Important tool in clinic and research
Reproducible expensive

Devices rarely available in clinical settings
• Experience required
• Sensitive technique from precise control adjustment is mandatory

Figure 1: Description of the different techniques for determining the VDO

IV. Conclusion

Overall, there is no universally accepted or perfectly precise method. To determine the VDO, the use of a combination of techniques is the most suitable method to date. More studies on craniometric techniques are needed, using anatomical landmarks that do not vary over the course of human life. In particular, there is a need for studies comparing the accuracy and reproducibility of several methods in dentate and toothless patients.

Bibliographic:


[22.] Makzoumé JE. A procedure for directly measuring the physiologic rest position and occlusal vertical dimension J Prosthodont. 2017 Jan 12.