



# The Vertical Dimension of Occlusion: To Raise or Not to Raise?

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## Abstract

The vertical dimension of occlusion (OVD) is the distance between the maxillary and mandibular teeth in maximum intercuspal contact. It is a complex and dynamic system that is influenced by a variety of factors, including the teeth, the periodontium, the temporomandibular joints (TMJs), and the muscles of mastication. In some cases, it may be necessary to increase the OVD. This can be done using a variety of methods, such as crowns, bridges, dentures, and orthodontic treatment. There is some controversy in the literature regarding the risks and benefits of increasing the OVD. However, other studies have shown that increasing the OVD is generally safe and that patients can adapt to the new OVD without any problems. When considering whether or not to increase the OVD, it is important to weigh the potential risks and benefits of the procedure. It is also important to consider the patient's individual needs and goals.

**Keywords:** Vertical dimension of occlusion; OVD; Occlusion; Dentition; Teeth; Periodontium; TMJs; Mastication; Crowns; Bridges; Dentures; Orthodontic treatment; Risks; Benefits

## Introduction

The vertical dimension of occlusion (OVD) is a fundamental concept in dentistry. It is defined as the distance between two selected anatomic points when the mandibular teeth are in the maximum intercuspal position (MIP). The OVD plays an important role in facial esthetics, masticatory function, and phonetics [1]. A decrease in OVD can occur due to a variety of factors, including tooth wear, tooth loss, and resorption of the alveolar ridges [2]. This can lead to a number of problems, including decreased facial height, changes in facial appearance, and temporomandibular disorders (TMDs) [2]. In some cases, it may be necessary to increase the OVD in order to restore proper function and esthetics [3]. This can be done using a variety of methods, such as crowns, bridges, dentures, and orthodontic treatment [3]. The decision of whether or not to increase the OVD is a complex one. There are a number of factors to consider, such as the patient's age, overall health, and dental history. It is also

important to weigh the potential benefits of increasing the OVD against the risks, such as the development of TMDs [4].

This review article will discuss the following aspects of the OVD:

- The definition of OVD and its importance [1]
- The causes of a decrease in OVD [2]
- The consequences of a decreased OVD [2]
- The methods of increasing the OVD [3]
- The considerations involved in the decision of whether or not to increase the OVD [4]

This review aims to provide a comprehensive overview of the OVD in the maxillofacial region, drawing on the latest research findings.

## Review of the literature on increasing the occlusal vertical dimension

The vertical dimension of occlusion (OVD) is the distance between two selected anatomic points when the mandibular teeth are in the maximum intercuspal position (MIP). The OVD plays

an important role in facial esthetics, masticatory function, and phonetics [1]. A decrease in OVD can occur due to a variety of factors, including tooth wear, tooth loss, and resorption of the alveolar ridges [2,3]. This can lead to a number of problems, including decreased facial height, changes in facial appearance, and temporomandibular disorders (TMDs) [2,3]. In some cases, it may be necessary to increase the OVD in order to restore proper function and esthetics [3]. This can be done using a variety of methods, such as crowns, bridges, dentures, and orthodontic treatment [3,4].

### Methods of Increasing the OVD

The methods used to increase the OVD vary depending on the individual patient's needs and the specific clinical situation. Some common methods include:

- Diagnostic occlusal acrylic splints: These splints are used to gradually increase the OVD over a period of time. This allows the patient to adapt to the new OVD and assess their tolerance before any irreversible changes are made to their dentition [1,4].
- Crowns and bridges: These restorations can be used to increase the height of the teeth and thereby increase the OVD [3,4].
- Dentures: Dentures can be used to replace missing teeth and restore the OVD [3,4].
- Orthodontic treatment: Orthodontic treatment can be used to move the teeth into a position that increases the OVD [3,4].

### Considerations involved in the decision of whether or not to increase the OVD

There are a number of factors to consider when deciding whether or not to increase the OVD. These factors include:

- The patient's age [2,4]
- The patient's overall health [2,4]
- The patient's dental history [2,4]
- The severity of the decrease in OVD [2,4]
- The patient's desired esthetic outcome [2,4]
- The potential risks and benefits of increasing the OVD [2,4]

### Risks and benefits of increasing the OVD

The potential risks associated with increasing the OVD include:

- Temporomandibular disorders (TMDs) [2,4]
- Muscle pain and tension [2,4]
- Headaches [2,4]
- Changes in facial appearance [2,4]
- Difficulty closing the lips or speaking [2,4]

### The potential benefits of increasing the OVD include

- Improved facial esthetics [2,4]
- Improved masticatory function [2,4]
- Reduced risk of TMDs [2,4]
- Improved speech [2,4]

### Discussion

The vertical dimension of occlusion (OVD) is the vertical distance between the maxillary and mandibular teeth in maximum intercuspatal contact. It is a complex and dynamic system that is influenced by a variety of factors, including the teeth, the periodontium, the temporomandibular joints (TMJs), and the muscles of mastication [1]. In some cases, it may be necessary to increase the OVD. This can be done using a variety of methods, such as crowns, bridges, dentures, and orthodontic treatment [1]. There is some controversy in the literature regarding the risks and benefits of increasing the OVD. Some authors have expressed concern that increasing the OVD can lead to problems such as temporomandibular disorders (TMDs) and muscle pain. However, other studies have shown that increasing the OVD is generally safe and that patients can adapt to the new OVD without any problems [2].

### Clinical considerations

When considering whether or not to increase the OVD, it is important to weigh the potential risks and benefits of the procedure. It is also important to consider the patient's individual needs and goals [1, 2].

Some factors to consider when making the decision of whether or not to increase the OVD include:

- The patient's age [1,2]
- The patient's overall health [1,2]
- The patient's dental history [1,2]
- The severity of the decrease in OVD [1,2]
- The patient's desired esthetic outcome [1,2]
- The potential risks and benefits of increasing the OVD [1,2]

### Points from the given articles

- In patients with erosive wear and missing teeth, it is important to use a safe clinical technique when increasing the OVD [3].
- Three-dimensional imaging (MR) can be used to assess the TMJ conditions and ensure that the OVD increase does not disrupt the musculoskeletal balance [3].
- In complete denture wearers, the reestablishment of the OVD can be performed in two stages to allow the patient to adapt to the new OVD [4].
- There is no single, universally accepted method for determining the VDO [4].



- Cephalometric studies have shown a strong correlation between the VDO determined by different methods [4].

## Conclusion

The vertical dimension of occlusion (OVD) is a complex and dynamic system that is essential for proper facial esthetics, masticatory function, and phonetics. A decrease in OVD can occur due to a variety of factors, and can lead to a number of problems. In some cases, it may be necessary to increase the OVD in order to restore proper function and esthetics. There are a number of methods that can be used to increase the OVD, including diagnostic occlusal acrylic splints, crowns and bridges, dentures, and orthodontic treatment. The best method for increasing the OVD will vary depending on the individual patient's needs and the specific clinical situation. When considering whether or not to increase the OVD, it is important to weigh the potential risks and benefits of the procedure. Some of the potential risks include temporomandibular disorders (TMDs), muscle pain and tension, headaches, changes in facial appearance, and difficulty closing the lips or speaking. However, the potential benefits of increasing the OVD can include improved facial esthetics, improved masticatory function, reduced risk of TMDs, and improved speech. The decision of whether or not to increase the OVD is a complex one that should be made on a case-by-case basis. It is important to weigh the potential risks and benefits of the procedure, and to consider the patient's individual needs and goals. In addition to the points discussed in the article, it is important to note that there is no single, universally accepted method for determining the VDO. However, cephalometric studies have shown a strong correlation between the VDO determined by different methods. Overall, increasing the OVD can be a safe and effective way to improve facial esthetics, masticatory function, and speech. However, it is important to carefully consider the potential risks and benefits of the procedure before making a decision.

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