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## “Monday Morning Pearls of Practice by Bobby Baig”

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### **Edentulous patient: Implant supported prosthetics: Pre-Prosthetic Space assessment and Classification:**

#### **Introduction:**

Dental restorative space may be defined as the 3-dimensional oral space available for prosthodontic restoration. In general terms, this space in edentulous patients is bounded by

1. The proposed occlusal plane,
2. Denture bearing tissues of the edentulous jaw,
3. Facial tissues (cheeks and lips), and the tongue.

Anatomic and physiologic dynamics of these oral structures: Reflect the dramatic and progressive change that accompanies the edentulous state. Functional aspects of oral structures that bound the restorative space must be carefully considered during the planning phase of dental implant therapy.

Wax trial denture: Has an integral role in the treatment planning process. A properly executed wax trial denture incorporates esthetic, phonetic, functional, and anatomic factors critical to successful prosthodontic therapy.

When accomplished, the wax trial denture resides within the available restorative space and follows the physiologic dictates of the denture bearing tissues, the facial tissues, the tongue, and an appropriately oriented occlusal plane. physiologic harmony achieved with a properly developed wax trial denture has been presented at length by other authors.

Classification of Inter arch restorative space by: Swati Ahuja et al; J Prosthet Dent 2011

1. There are four distinct classes that represent available vertical restorative space in edentulous arches.
2. This classification should be considered during the diagnostic phase of dental implant therapy.
3. The classification system presented suggests a range of restorative dimensions with associated treatment and prosthesis design considerations.
4. Once diagnosed, all of these factors facilitate conceptualization of patient conditions for those involved in providing therapy, including restorative dentists, surgeons and dental laboratory technicians.
5. From an educational perspective, correlating therapeutic approach with specific patient classifications may help students to grasp challenging concepts.
6. Prosthodontic implications for each class are suggested, and clinical considerations to improve available restorative space are presented.

**Classification Criteria:** This classification is based upon the restorative space from the crest of the soft tissues of the residual ridge to the proposed occlusal plane:

**Class I: Space is equal to or greater than 15mm (Fig 1)**

1. This condition may correlate with long-term edentulism, characterized by considerable alveolar bone resorption.
2. With an abundance of vertical restorative space, the full range of implant overdenture attachment systems (bar and clip attachments and stud-type attachments) may be considered when designing the prosthesis.
3. Over dentures made for patients in this class typically possess sufficient material bulk to render the prosthesis resistant to fracture.
4. However, as the distance from prosthesis foundation (edentulous ridge and/or implants) to the occlusal plane increases, consideration must be given to vertically cantilevered occlusal loading.
5. Additionally, aggressive residual ridge resorption may require that denture teeth be positioned off the crest of the edentulous ridge in a horizontal dimension.
6. Horizontally cantilevered occlusal loading must also be carefully managed.

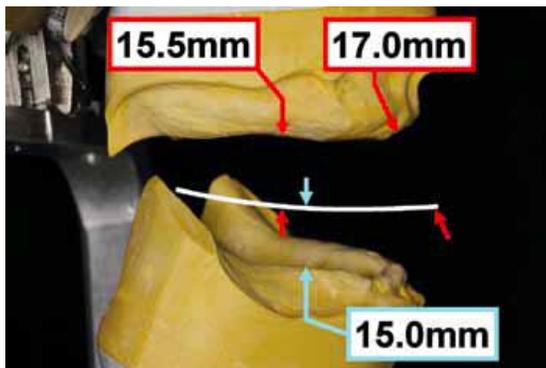


Fig 1

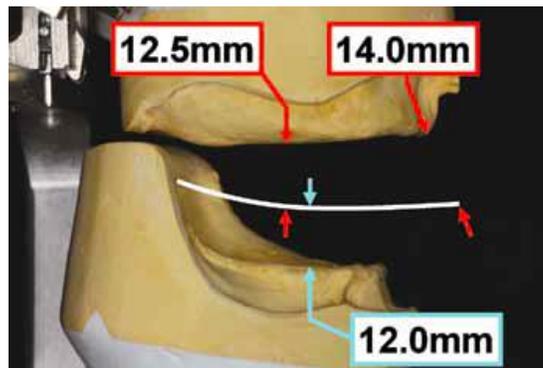


Fig 2

**Class II: Space is between 12mm - 14mm (Fig 2)**

1. Class II restorative space exists when vertical space, from the soft tissue crest of the residual edentulous ridge to the proposed occlusal plane, is between 12 mm and 14 mm (Fig. 2).
2. Most overdenture attachments work well here, but bar and clip systems must be carefully designed to fit optimally within a denture base of physiologically acceptable contour. Overdenture fabricated for Class II conditions usually permit sufficient denture base resin bulk for adequate structural integrity and prosthesis durability.

**Class III: Space is between 9mm - 11mm (Fig 3)**

1. When vertical space from the soft tissue crest of the residual ridge to the occlusal plane is between 9 mm and 11 mm, the arch is designated Class III (Fig. 3).
2. Given these dimensional restrictions, selection of an appropriate overdenture attachment system becomes more critical, particularly at the low end of this dimensional range.
3. The overall height and width of the selected attachment system will affect denture tooth position and the bulk of denture base resin.
4. For attachment systems that occupy a substantial volume within the confines of physiologically acceptable denture base contours, consideration should be given to prosthesis structural durability.
5. Existing studies suggest that incorporating a metal framework may reinforce or strengthen the overdenture.
6. It has been recommended that a minimum of approximately 12 mm of vertical restorative space (crest of bone to occlusal plane) is necessary to accomplish a mandibular implant assisted overdenture.
7. If this recommendation is not followed, most Class III patients may not be candidates for overdenture therapy.

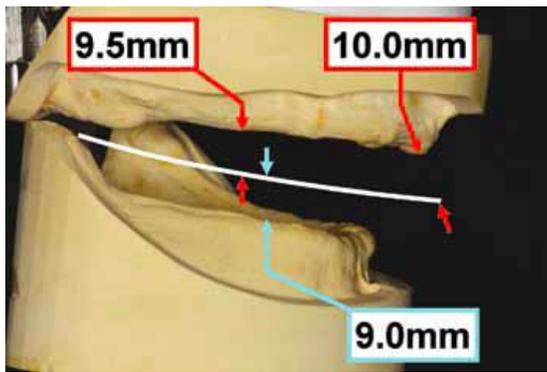


Fig 3

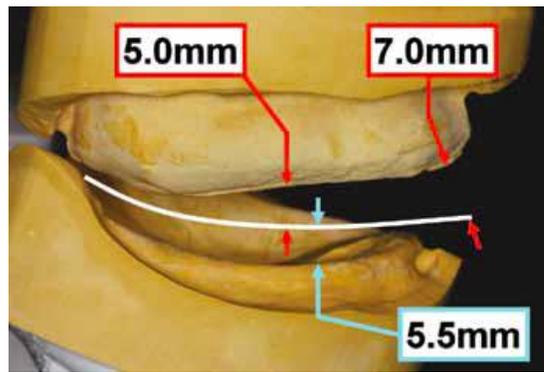


Fig 4

#### Class IV: Space is less than 9mm (Fig 4)

1. When vertical space from the soft tissue crest of the edentulous ridge to the proposed occlusal plane is less than 9 mm, a Class IV condition exists (Fig. 4).
2. In Class IV patients, a substantial portion of the alveolar process remains intact, as is often the situation immediately following natural tooth extractions. Limited vertical space may be available for prosthesis fabrication and placement.
3. From a vertical restorative space perspective, this condition is considered least favorable.
4. Attachment system selection, esthetic and functional denture tooth positioning, denture base contour and structural durability of the overdenture become significant concerns.
5. It is critical to successful, long-term, dental implant rehabilitation of these patients that thorough diagnostics is needed to identify this lack of adequate restorative space prior to surgical implant placement.
6. Reinforcement of the overdenture to maintain physiologically acceptable denture base contours, while improving resistance to fracture, should be considered in Class IV patients.

#### Conclusion:

1. The vertical restorative space classification system described here will assist clinicians to evaluate their patients and to communicate patient needs effectively.
2. This classification system will also facilitate decisions regarding pre-surgical tissue manipulation, the design of final prostheses, and choice of attachment systems early in the therapeutic process.

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