

# The Effect of Different Mandibular Dentures on Antagonistic Maxillary Ridge

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There are problems with the prosthetic treatment of completely edentulous patients. Those problems have to do with the fact that the residual ridges to which prostheses are meticulously fitted, change in shape and are reduced in size at varying rates in different individuals and in the same individual at different times.

The anterior part of the maxilla is the weakest part of the upper arch to resist stress. When using implants in the edentulous mandible, or when lower anterior teeth occlude anterior to the basal support, trauma is inevitable.<sup>1</sup>

Implant-retained mandibular dentures can satisfy edentulous patients, and have demonstrated a patient influence on mastication, retention, and stability.<sup>2</sup>

A variety of attachments is available for use with implant overdentures. The selection of a specific type of attachment depends on the type of overdenture to be fabricated. The overdenture attachment may permit movement during function and may produce excessive force on the antagonistic arch.<sup>2</sup>

One can differentiate between mainly mucosa-supported and mucosa implant-supported overdentures, and mainly implant-supported overdentures. The mainly mucosa-supported implant overdenture is retained by magnet or ball attachments on 2 implants. The mucosa implant-supported overdenture is retained by a supra-

**Purpose:** *Is to evaluate the antagonistic, maxillary ridge resorption for different prosthetic modalities mainly mucosa-supported mandibular complete overdentures, combined mucosa implant-supported mandibular complete overdenture, and lower conventional complete dentures.*

**Materials and Methods:** *Fifteen completely edentulous patients were divided into 3 groups; 5 patients each. Group I patients received maxillary conventional denture and mandibular overdentures retained by magnet attachment on 2 implants (mainly mucosa-supported overdenture). Group II patients received maxillary conventional denture and mandibular overdentures retained by bar attachment on 2 implants (combined mucosa implant-supported overdenture). Group III patients received upper and lower conventional complete denture. All patients were evaluated clinically and radiographically immediately after in-*

*sertion and after 1 and 2 years. Panoramic radiographic film was used to evaluate the antagonistic maxillary ridge resorption.*

**Results:** *Indicated a more pronounced annual bone resorption of the antagonistic maxillary ridge after 2 years in patients with conventional complete denture wearers when compared with patients with combined mucosa implant-supported mandibular complete overdenture and mainly mucosa-supported mandibular complete overdenture groups.*

**Conclusion:** *Using a combined mucosa implant-supported mandibular complete overdenture the amount of antagonistic maxillary alveolar bone resorption increases when compared with the mainly mucosa-supported complete overdenture. (Implant Dent 2007; 16:421–429)*

**Key Words:** *dental implant, overdenture, maxillary ridge resorption*

structure, consisting of 2 implants interconnected by a bar screwed onto the implants. This denture rests on the mucosa in the dorsal areas and on the bar in the anterior region. This bar is the axis over which the overdenture can rotate during vertical dorsal loading. Retention and stability are ensured during lateral and extrusive forces. During vertical loading, the implants carry the occlusal loading of the denture in the anterior region, but in the dorsal region, the mucosa is loaded. The mainly implant-supported overdenture, primarily attached to the suprastructure, on the implants, the suprastructure is placed on

a minimum of 4 intraforaminally placed implants, which are interconnected with a triple bar. The bar gives retention and stability to the overdenture. During vertical loading, the mucosal denture-bearing area is hardly loaded.<sup>3</sup>

In situations in which mandibular implant overdentures oppose maxillary complete dentures, the conditions may be produced at the prosthesis-tissue interface that are similar to those observed with combination syndrome (glossary of prosthodontic terms defines combination syndrome as “the characteristic feature that occur when an edentulous maxilla is op-

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posed by natural mandibular anterior teeth, including loss of bone from the anterior portion of the maxillary ridge, overgrowth of the tuberosities, papillary hyperplasia of the hard palate's mucosa, extrusion of the lower anterior teeth, and loss of alveolar bone and ridge height beneath the mandibular removable partial denture base").<sup>4</sup> This condition is usually associated with mandibular distal extension removable partial denture and maxillary complete denture treatments in situations in which mandibular posterior prosthesis support is lost.<sup>5-8</sup> This situation can lead to the transference of significant occlusal forces into the anterior maxilla with subsequent maxillary alveolar bone resorption and soft tissue inflammation.<sup>9</sup>

For several years, implant-supported overdentures have been used with excellent results in rehabilitation of the edentulous mandible. However, the effect on the antagonistic maxillary edentulous jaw bone resorption has not yet been evaluated.<sup>7</sup> The purpose of this study is to evaluate the antagonistic, maxillary ridge for different prosthetic modalities; mainly mucosa-supported mandibular complete overdentures, combined mucosa implant-supported mandibular complete overdenture, and lower conventional complete dentures.

## MATERIALS AND METHODS

Fifteen completely edentulous patients were selected free from any systemic or a local disease that might make the placement of the dental implant contraindicated. The patients were divided into 3 groups, 5 patients each. Each patient of the first and second groups received 2 press fit dental implants (Dyna Dental Implant, Dyna Dental Engineering, Bergen op zoom, The Netherlands), one at each side in the canine regions of the mandible. The implants were left submerged and unloaded for healing and osseointegration period of 4 months.

Group I patients received mandibular overdentures retained by magnet attachment (mainly mucosa-supported overdenture). The magnets were attached to the denture at the time of delivery by chair side resilient magnet bond (Dyna I.M.P system, Dyna Dental Engineering, Bergen op zoom).

**Table 1.** Mean, Standard Deviation, and Paired *t* Test for the Thickness of the Soft Tissues Overlying the Maxillary Anterior Ridge During the Follow-up Period

Interval	Anterior				Posterior			
	Mean	SD	<i>t</i> Test	<i>P</i>	Mean	SD	<i>t</i> Test	<i>P</i>
Insertion, first yr								
Group I	1.59-1.49	0.35	1.7	NS	1.64-1.56	0.33	2	NS
Group II	1.39-1.23	0.25	4.6	*	1.63-1.54	0.36	6	*
Group III	1.46-1.27	0.04	4.1	*	1.5-1.38	0.35	4	†
Insertion, second yr								
Group I	1.59-1.45	0.35	2	NS	1.64-1.53	0.36	2.4	NS
Group II	1.39-1.17	0.23	5.9	*	1.63-1.49	0.32	2.6	*
Group III	1.46-1.18	0.5	9.9	†	1.5-1.32	0.44	4.7	†

\* *P* < 0.05.

† *P* < 0.01.

NS indicates nonsignificant.

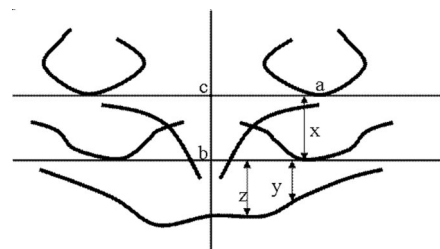
Group II patients received mandibular overdentures retained by a bar attachment (combined mucosa implant-supported overdenture). The metal housing was secured to the fitting surface of the denture at the area between the 2 bar abutments.

Patients of both groups I and II were supplied with conventional maxillary complete dentures. Group III patients received upper and lower conventional complete denture. All patients were evaluated clinically and radiographically immediately after overdenture delivery and after 1 and 2 years.

## Clinical Evaluation

The thickness of the soft tissue overlying the anterior maxillary ridge was measured at 2 points 1 cm and 2 cm bilaterally to the midline by using a sharp probe with rubber stopper. All measurements were added and the mean were calculated, after 1 and 2 years to evaluate the effect of different mandibular dentures on the mucosa of antagonistic maxillary bone ridge under complete conventional denture (Table 1).

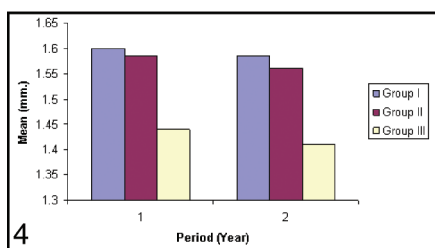
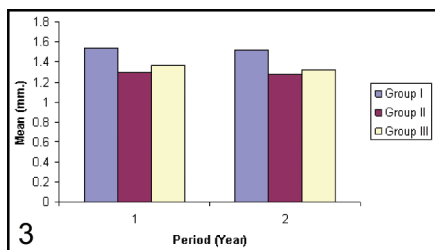
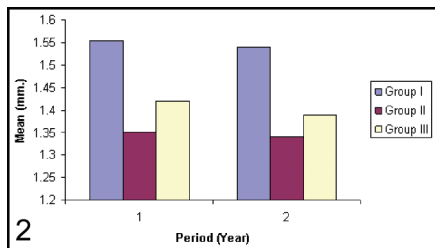
**Radiographic evaluation.** Panoramic radiograph was taken to measure the amount of the maxillary ridge resorption. A tracing paper was laid over each radiograph and the entire maxillary jawbone was traced. The method adopted by Packota *et al*<sup>7</sup> and modified by Abdel-Monem<sup>8</sup> was used. A line was drawn joining the inferior margins of the images of the zygomatic processes of the maxillae. A second line was drawn joining the inferior points of the borders of the bony



**Fig. 1.** Lines and points of measurement: (x) line joining most inferior points of borders of bony orbits to line joining inferior margins of images of zygomatic processes. (y) From zygomatic processes line to alveolar crest. (z) From zygomatic processes line to alveolar crest from a point representing the middle of abc.

orbits. On both sides, a line perpendicular to the interorbital line from the point where it intersected the inferior border of the orbit was drawn. This perpendicular line was extended to the height of the alveolar crest (first molar region). The midline was determined by a line connecting a point representing the anterior nasal spine and a point representing the lowest midline point on the anterior maxillary ridge. On both sides, at the midline from a point representing the middle of the triangle ABC was drawn and extended to the tracing of the height of the alveolar crest (Fig. 1). X is the distance from interorbital line to zygomatic process; Y is the distance from zygomatic process line to alveolar crest (posterior region); and Z is the distance from the zygomatic process line to alveolar crest (anterior region).

All measurements were made to the nearest 0.2 mm by using a dilcaliper. The mean of the ratios X/Y and



**Fig. 2.** Mean for the thickness of the soft tissues overlying the maxillary anterior ridge during the follow-up period.

**Fig. 3.** Mean for the ratio of bone measurement in the posterior maxillary (X/Y) during the follow-up period.

**Fig. 4.** Mean for the ratio of bone measurement in the anterior maxillary (X/Y) during the follow-up period.

X/Z were calculated to nearest 0.01 mm. The use of ratios measurement was done to overcome errors of magnification or in patient's position on panoramic machine. There were 2 anatomical points considered; one point was anterior nasal spine and the other point was the lowest midline point on the anterior maxillary ridge. The distance between them was measured.

Two investigators examined all tracings twice and separately. All panoramic radiographs of the patients were analyzed. The results were analyzed statistically.

The analysis of variance and *post hoc* tests were calculated to evaluate the antagonistic, maxillary ridge resorption for all patients.

## RESULTS

### Results of Clinical Evaluation

When comparing the mean percentage changes of the soft tissue thickness (overlying the anterior maxillary ridge)

**Table 2.** Mean, Standard Deviation, and Paired *t* Test for the Ratio of Bone Measurement in the Anterior and Posterior Maxillary (X/Y) During the Follow-up Period

Interval	Insertion-1 yr				Insertion-2 yr			
	Mean	SD	<i>t</i> Test	<i>P</i>	Mean	SD	<i>t</i> Test	<i>P</i>
Group I	1.59–1.52	0.36	1.7	NS	1.59–1.49	0.35	2	NS
Group II	1.39–1.31	0.25	2.5	NS	1.39–1.29	0.25	5.9	*
Group III	1.46–1.38	0.50	2.8	NS	1.46–1.34	0.04	6.9	*

\* *P* < 0.05.

NS indicates nonsignificant.

from the baseline values for all groups, it showed nonsignificant difference at 1 year. However, at 2 years the group that had combined mucosa implant-supported mandibular complete overdenture (group II) and the group that had conventional upper and lower complete denture showed significant difference, whereas the mainly mucosa-supported mandibular overdenture (group I) showed no significant difference.

### Results of Radiographic Evaluation

The amount of antagonistic anterior and posterior maxillary bone resorption in group that had mainly mucosa-supported mandibular overdenture (group I) showed no significant difference during the follow-up period (Figs. 2–4) (Table 2), whereas the group that had combined mucosa implant-supported mandibular complete overdenture (group II) showed significant difference in the anterior and posterior areas after 1 and 2 years.

After 1 year, the group having conventional complete upper and lower dentures showed significant difference in the maxillary anterior region and highly significant difference in the maxillary posterior area, whereas after 2 years both maxillary anterior and posterior areas showed highly significant differences.

## DISCUSSION

A mandibular 2-implant overdenture opposed by a maxillary conventional denture is a more satisfactory treatment than conventional dentures for edentulous patients.<sup>10,11</sup> The implant overdenture is supported by both implant and mucosa so that fewer implants are necessary than for a prosthesis that is supported only by implants.

The 2-implant overdenture is an attractive treatment because of its rel-

ative simplicity, minimal invasiveness, and economy.<sup>12</sup>

Several authors reported that the response of supporting soft tissues for implant overdentures and opposing prostheses was combination syndrome,<sup>5,8,13</sup> lack of maxillary denture stability, permits movement of the dentures that causes irritation and inflammation of the mucosa. The result of the present study showed a slight increase in the thickness of mucosa in the anterior region in the group having a conventional complete denture and in the group using bar-retained mandibular overdenture. This result agrees with Lebshtien and Mohie-Eldin.<sup>14</sup>

The present study found more pronounced annual bone resorption in anterior region of the antagonistic maxillary bone ridge after 1 year whereas the resorption was increased in anterior and posterior maxillary bone ridges after 2 years in case of conventional complete denture when compared with that of an overdenture. This finding may be explained by instability of the complete dentures, which contributes to an unfavorable stress distribution among the denture-bearing areas. This is in agreement with Jacobs *et al*,<sup>15</sup> Burns *et al*,<sup>16</sup> and Tuncay *et al*<sup>17</sup> who found improved tissue health and reduced annual residual ridge resorption in supporting tissues of prostheses that oppose a mandibular implant overdenture. They concluded that a more stable occlusion provides a better distribution of occlusal forces and protects the maxillary anterior edentulous ridge. Jacobs *et al*<sup>15</sup> pointed out the need for regular recalls and routine prosthesis relines to maintain proper occlusal relationships.

In situations in which mandibular implant overdentures oppose maxillary complete dentures, a condition

may be produced at the prosthesis-tissue interface that is similar to that observed with combination syndrome.<sup>15</sup> This condition is usually associated with a mandibular distal extension removable partial denture and maxillary complete denture treatments in situations in which mandibular posterior prosthesis support is lost.<sup>5,8</sup> The result of the present study showed that, the amount of antagonistic maxillary bone resorption was significant when using the combined mucosa implant-supported mandibular complete overdenture, compared with that using mucosa-supported complete overdentures. This result was in accordance with the observation of Jacobs *et al*<sup>15</sup> and may be attributed to the increase of occlusal force of the combined mucosa implant-supported mandibular complete overdenture, compared with that using mucosa-supported one.

The result of this study showed that the decrease in bone height was always more in the anterior region than in the posterior region of maxillary jaw bone. This may be due to the transference of significant occlusal forces into the anterior maxilla with subsequent maxillary alveolar bone resorption and soft tissue inflammation.

## CONCLUSION

1. A more pronounced annual bone resorption in anterior region of maxilla is observed in complete denture wearers compared with that in patients with overdentures supported by 2 osseointegrated implants.
2. Using mucosal support, mandibular overdenture reduces the amount of alveolar ridge resorption of the antagonistic maxillary arch.
3. Using a combined mucosa implant-supported mandibular complete overdenture the amount of antagonistic maxillary alveolar bone increases when compared with the

mainly mucosa-supported complete overdenture.

4. The thickness of the soft tissue overlying the anterior maxillary ridge increases in the group that had combined mucosa implant-supported mandibular complete overdenture and the group used conventional complete upper and lower denture after 2 years.

## Disclosure

The authors claim to have no financial interest in any company or any of the products mentioned in this article.

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**Auswirkungen unterschiedlicher Zahnprothetik auf den antagonistischen Oberkieferkamm**

**ZUSAMMENFASSUNG: Zielsetzung:** Es soll die Resorption im antagonistischen Oberkieferkamm bei verschiedenen prothetischen Vorgaben untersucht und bewertet werden. Dabei geht es hauptsächlich um Schleimhautgestützte komplette Zahnprothesen im Unterkiefer, kombinierte Schleimhaut-Implantat-gestützte komplette Prothesen für den Unterkiefer sowie untere konventionelle Vollprothesen. **Materialien und Methoden:** Bei Teilnahme von insgesamt 15 Patienten mit komplett zahnlosem Gebiss wurden drei unterschiedliche Gruppen mit je 5 Testpersonen gebildet. Die Patienten der Versuchsgruppe I wurden mit konventionellen Oberkieferprothesen sowie mittels Magnetstützapparatur auf 2 Implantaten gesetzten Unterkieferprothesen (hauptsächlich Schleimhautgestützte Zahnprothetik) ausgestattet. Bei den Patienten der Versuchsgruppe II dagegen wurde eine konventionelle Oberkieferprothese und eine Unterkieferprothese mit mittels Bügel gehaltener Stützkonstruktion auf 2 Implantaten (kombinierte Schleimhaut-Implantat-gestützte Zahnprothetik) eingesetzt. Die Patienten der Gruppe III schließlich erhielten für sowohl Ober- als auch Unterkiefer konventionelle Vollprothesen. Alle Patienten wurden unmittelbar nach Einsetzen der Prothese sowie nach einem und zwei Jahren klinisch und röntgenologisch untersucht. Zur Ermittlung der Resorption des antagonistischen Oberkieferkamms wurden Panoramaaufnahmen erstellt. **Ergebnisse:** Nach zwei Jahren zeigte sich eine deutlichere jährliche Knochengewebresorption des antagonistischen Oberkieferkamms bei den Patienten mit konventioneller Vollprothese im Vergleich zu den Patienten, denen eine kombinierte Schleimhaut-Implantat-gestützte Unterkieferprothese eingesetzt wurde, sowie auch zu den Patienten mit einer hauptsächlich Schleimhautgestützten kompletten Zahnprothese im Unterkiefer. **Schlussfolgerung:** Durch Verwendung einer kombinierten Schleimhaut-Implantat-gestützten kompletten Unterkieferprothese zeigt sich ein gesteigerter Grad der Resorption des antagonistischen Alveolärknochengewebes im Oberkiefer im Vergleich zu den hauptsächlich Schleimhautgestützten Vollprothesen.

**SCHLÜSSELWÖRTER:** Zahnimplantat, Deckprothese, Resorption des Oberkieferkamms

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**El efecto de diferentes dentaduras mandibulares en la cresta maxilar antagónica**

**ABSTRACTO: Propósito:** Evaluar la reabsorción de la cresta maxilar antagónica de diferentes modalidades protésicas; principalmente sobredentaduras completas mandibulares apoyadas en la mucosa, sobredentaduras completas mandibulares apoyadas en una combinación de mucosa e implantes y dentaduras completas inferiores convencionales. **Materiales y Métodos:** Quince pacientes completamente edentulosos fueron divididos en tres grupos de cinco pacientes cada uno. Los pacientes del grupo I recibieron una dentadura maxilar convencional y sobredentaduras mandibulares retenidas por la colocación de imanes en dos implantes (principalmente una sobredentadura apoyada en la mucosa). Los pacientes del grupo II recibieron una dentadura maxilar convencional y sobredentaduras mandibulares retenidas por la sujeción con barras a dos implantes (sobredentaduras completas mandibulares apoyadas en una combinación de mucosa e implantes). Los pacientes del grupo III recibieron una dentadura completa convencional superior a inferior. Todos los pacientes fueron evaluados clínica y radiográficamente inmediatamente después de la colocación y luego de uno y dos años. Se usaron radiografías panorámicas para evaluar la reabsorción de la cresta maxilar antagónica. **Resultados:** Indicaron una reabsorción anual del hueso más pronunciada de la cresta maxilar antagónica luego de dos años en pacientes con dentaduras completas convencionales comparado con los pacientes con sobredentaduras completas mandibulares apoyadas en una combinación de mucosa e implantes y grupos con sobredentaduras completas mandibulares apoyadas principalmente en la mucosa. **Conclusión:** Usar una sobredentadura completa mandibular apoyada en una combinación de mucosa e implantes aumenta la cantidad de reabsorción del hueso alveolar antagónico comparado con la sobredentadura completa apoyada principalmente en la mucosa.

**PALABRAS CLAVES:** Implante dental, sobredentadura, reabsorción de la cresta maxilar

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### **O Efeito de Diferentes Dentaduras Mandibulares sobre o Rebordo Maxilar Antagônico**

**RESUMO: Objetivo:** É avaliar a reabsorção do rebordo maxilar antagônico para diferentes modalidades protéticas; sobre dentaduras completas suportadas principalmente por mucosa, sobredentaduras mandibulares completas suportadas pela combinação de mucosa e implante e dentaduras completas convencionais inferiores. **Materiais e Métodos:** Quinze pacientes completamente desdentados foram divididos em três grupos; cinco pacientes cada. Os pacientes do Grupo I receberam dentadura maxilar convencional e sobredentaduras mandibulares retidas por attachment de magneto em dois implantes (sobredentadura suportada principalmente por mucosa). Os pacientes do Grupo II receberam dentadura convencional completa superior e inferior. Todos os pacientes foram avaliados clínica e radiograficamente imediatamente após a inserção e após um e dois anos. Foi usado filme radiográfico panorâmico para avaliar a reabsorção do rebordo maxilar antagônico. **Resultados:** Indicaram uma reabsorção anual mais pronunciada de osso do rebordo maxilar antagônico após dois anos em pacientes portadores de dentadura completa convencional em comparação com pacientes com sobredentadura mandibular completa suportada por uma combinação de mucosa e implante e grupos de sobredentadura mandibular completa suportada principalmente por mucosa. **Conclusão:** Usar uma sobredentadura mandibular completa suportada por uma combinação de mucosa e implante aumenta a quantidade de reabsorção de osso alveolar maxilar antagônico em comparação com a sobredentadura completa suportada principalmente por mucosa.

**PALAVRAS-CHAVE:** Implante dentário, sobredentadura, reabsorção do rebordo maxilar

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### **Эффект использования различных протезов нижней челюсти на антагонистический альвеолярный отросток верхней челюсти**

**КРАТКОЕ ОПИСАНИЕ: Цель:** оценить резорбцию антагонистического альвеолярного отростка верхней челюсти при различных методах протезирования: использовании полностью съемных протезов нижней челюсти с основной опорой на слизистую, комбинированных полностью съемных протезов нижней челюсти с опорой на слизистую и имплантаты, а также стандартных полностью съемных зубных протезов на нижнюю челюсть. **Материалы и методы:** пятнадцать полностью лишенных зубов пациентов были разделены на три группы, в каждой из которых оказалось по пять пациентов. Пациентам группы I были установлены стандартные протезы на верхнюю челюсть и протезы на нижнюю челюсть, которые удерживались с помощью магнитного крепления к двум имплантатам (протезы с основной опорой на слизистую). Пациентам группы II были установлены стандартные протезы на верхнюю челюсть и протезы на нижнюю челюсть, которые удерживались дуговым креплением к двум имплантатам (комбинированные протезы с опорой на слизистую и имплантаты). Пациентам группы III были установлены стандартные полностью съемные зубные протезы на верхнюю и нижнюю челюсть. Все пациенты были обследованы клинически и рентгенологически незамедлительно после постановки зубного протеза, а также один и два года спустя. Для оценки резорбции альвеолярного отростка верхней челюсти использовалась панорамная радиографическая пленка. **Результаты:** показали более четко выраженную годовую костную резорбцию альвеолярного отростка верхней челюсти по прошествии двух лет у пациентов со стандартными полностью съемными зубными протезами по сравнению с группами пациентов с комбинированными полностью съемными протезами нижней челюсти с опорой на имплантат и слизистую и с полностью съемными протезами нижней челюсти с основной опорой на слизистую. **Вывод:** использование комбинированных полностью съемных протезов нижней челюсти с опорой на имплантат и слизистую повышает объем резорбции альвеолярного отростка верхней челюсти по сравнению с использованием полностью съемных протезов нижней челюсти с основной опорой на слизистую.

**КЛЮЧЕВЫЕ СЛОВА:** зубной имплантат, съемный зубной протез, резорбция альвеолярного отростка верхней челюсти

対合上顎骨梁に作用する各種下顎義歯の影響

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研究概要:

目的: 本研究は異なる種別の義歯が作用して起る対合上顎骨梁吸収の評価を目的とする; 主に口腔粘膜でサポートする下顎コンプリート・オーバーデンチャー、口腔粘膜とインプラントの組合せでサポートする下顎コンプリート・オーバーデンチャー、そして従来の下顎総義歯を対象にした。

研究素材と方法: 15名の総義歯利用患者を3組のグループに分けた; 各グループに5名の患者という内訳である。グループIの患者には上顎に従来の義歯、そして対合する下顎には2本のインプラント上にマグネットアタッチメントで装着するオーバーデンチャー (主に口腔粘膜でサポートするオーバーデンチャー) を挿入した。グループIIの患者には上顎に従来の義歯、そして下顎に2本のインプラント上に取付けたバーでサポートするオーバーデンチャー (口腔粘膜/インプラント組合せサポートオーバーデンチャー) を挿入、そしてグループIIIの患者には上下とも従来の総義歯を挿入した。全患者の評価は義歯挿入直後、1年後そして2年後に臨床ならびにX線を利用して行った。対合上顎骨梁吸収評価にはパノラマX線フィルムを使用した。

結果: 口腔粘膜/インプラント組合せサポート下顎コンプリート・オーバーデンチャー挿入患者ならびに主に口腔粘膜でサポートする下顎コンプリート・オーバーデンチャー挿入患者の2組のグループと比較して、従来の総義歯を挿入した患者は2年後の検査までの年間に対合上顎にかなり著しい骨梁吸収を示した。

結論: 口腔粘膜/インプラント組合せサポート下顎コンプリートオーバーデンチャーは口腔粘膜を主なサポートとするコンプリートオーバーデンチャーと比較して、対合上顎歯槽骨吸収量増加を促進する。

キーワード: デンタルインプラント、オーバーデンチャー、上顎骨梁吸収

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## 頤抗性上頤脊不同義齒的作用

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### 摘要：

**目的：** 評估不同義齒療法的頤抗性上頤脊吸收，其中包括主要黏膜支持的全顎覆蓋式義齒、聯合黏膜植體支持的全顎覆蓋式義齒，以及較低的傳統全口義齒。

**資料與方法：** 將十五名完全缺牙的患者分成三組，每組五名。第一組患者採用傳統的上頤義齒，以及以磁石附連固定於兩顆植體的下頤覆蓋式義齒（主要黏膜支持的覆蓋式義齒）。第二組患者採用傳統的上頤義齒，以及桿狀附連固定於兩顆植體的下頤覆蓋式義齒（聯合黏膜植體支持的覆蓋式義齒）。第三組患者上、下頤均採用傳統的全口義齒。所有患者在嵌入後、嵌入一年和兩年之後，接受臨床與X光攝影評估。使用環口XX光攝影來評估頤抗性上頤脊吸收。

**結果：** 結果顯示，與聯合黏膜植體支持的上頤完全覆蓋式義齒和主要黏膜支持的上頤完全覆蓋式義齒兩組的患者比較，完全義齒的患者在配戴兩年之後，全年頤抗性上頤脊骨吸收更明顯。

**結論：** 和主要黏膜支持的上頤完全覆蓋式義齒比較，利用一個聯合黏膜植體支撐的上頤完全覆蓋式義齒，可以增加頤抗性上頤脊的骨吸收量。

**關鍵字：** 牙科植體、覆蓋式義齒、上頤脊吸收

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길항 상악 능선에 대한 여러 가지 하악 의치의 효과

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초록

**목적:** 다음과 같은 여러 가지 보철 종류에 대하여 길항 상악 능선 흡수를 평가함; 주로 점막에 의해 지지되는 하악 완전 피개의치, 점막-임플란트에 의해 합동 지지되는 하악 완전 피개의치 및 하악 일반 완전 의치.

**재료와 방법:** 15명의 완전 무치 환자들을, 각 군에 5명씩, 3개 군으로 나누었다. I군 환자들은 2개의 임플란트에 자석 부착에 의해 보유되는 상악 일반 의치와 하악 피개 의치를 시술 받았다(주로 점막에 의해 지지되는 피개의치). II군 환자들은 2개의 임플란트에 바(bar) 부착에 의해 보유되는 상악 일반 의치와 하악 피개의치를 시술 받았다(점막-임플란트에 의해 합동 지지되는 피개의치). III군의 환자들은 상악 및 하악 일반 완전 의치를 시술 받았다. 장착 직후, 1년 후 및 2년 후에 모든 환자를 임상적 및 방사선적으로 평가하였다. 파노라마 방사선 촬영 필름을 사용하여 길항 상악 능선 흡수를 평가하였다.

**결과:** 2년 후 길항 상악 능선의 연간 골 흡수는 점막-임플란트에 의해 합동 지지되는 하악 완전 피개 의치군과 주로 점막에 의해 지지되는 완전 피개 의치군의 환자들에 비해 일반 완전 의치군 환자들에서 더 현저한 것으로 나타났다.

**결론:** 점막-임플란트에 의해 합동 지지되는 하악 완전 피개 의치의 사용은 주로 점막에 의해 지지되는 완전 피개 의치에 비해 길항 상악 치조골 흡수량을 증가시킨다.

**핵심 단어:** 치과임플란트, 피개 의치, 상악 능선 흡수.

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