Chewing efficiency and electromyographic activity of masseter muscle with three designs of implant-supported mandibular overdentures. A cross-over study.

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Abstract

PURPOSE:
The aim of this study was to compare the effect of three designs for implant-supported mandibular overdenture on the chewing efficiency and electromyographic (EMG) activity of masseter muscles.

MATERIAL AND METHODS:
Eighteen edentulous patients received new maxillary and mandibular dentures (control, CD) before implant placement. After using the dentures for 3 months, patients were randomly divided into six blocks (three patients/block) and received four implants in canine and first molar areas of the mandible. Following osseointegration period, new duplicate mandibular overdentures were successively connected to the implants with: (i) ball attachment on two implants (2BOD), (ii) bar attachment on two implants (2ROD), and (iii) bar attachments on four implants (4ROD) in a random order. Chewing efficiency was measured using chewing gum, and EMG was recorded during clenching (with or without food). Evaluations were made 3 months after using each of the following prostheses: CD, 2BOD, 2ROD, and 4ROD.

RESULTS:
All implant-supported overdentures showed a significant increase in chewing efficiency and EMG values when compared to CD. These values increased significantly with 4ROD when compared to 2BOD or 2ROD prostheses. There was no significant difference in chewing efficiency and EMG between 2BOD and 2ROD prostheses.

CONCLUSION:
Four-implant-supported overdentures seem to present a functional advantage vs. two-implant-supported overdentures, independent of the chosen attachment system.

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