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Original Article**Association between occlusal force distribution in implant overdenture prostheses and residual ridge resorption**

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Summary

This study aimed to investigate residual ridge resorption (RRR) of anterior and posterior maxillary and mandibular edentulous ridges, in patients treated with mandibular implant overdentures (IOD) and compare with conventional complete denture (CD) wearers, and to determine at each location, the association of RRR with the occlusal forces distribution and other patients' variables. The anterior and posterior RRR of IOD (six males, 17 females) and CD (12 males, 11 females) groups were determined using baseline and follow-up dental panoramic radiographs (DPT) (mean intervals 4 ± 1.8 years). The bone ratios were calculated using proportional area: anatomic to fixed reference areas and mean difference of ratios between the intervals determined RRR. The ridge locations included anterior and posterior maxillary and posterior mandibular arches. The T-Scan III digital occlusal system was used to record anterior and posterior percentage occlusal force (%OF) distributions. There were significant differences in anterior and posterior %OF between treatment groups. Two-way ANOVA showed RRR was significant for arch locations ($P = 0.005$), treatment group (IOD versus CD) ($P = 0.001$), however, no significant interaction ($P = 0.799$). Multivariate regression analyses showed significant association between RRR and %OF at anterior maxilla ($P = 0.000$) and posterior mandible ($P = 0.023$) and for treatment groups at posterior maxilla ($P = 0.033$) and mandibular areas ($P = 0.021$). Resorption was

observed in IOD compared to CD groups, with 8·5% chance of less resorption in former and 7·8% in the latter location. Depending on arch location, ridge resorption at various locations was associated with occlusal force distribution and/or treatment groups (implant prostheses or conventional complete dentures).

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