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Reliance on Diagnostic Elements in Panoramic Imaging with Focus on Ameloblastoma and Keratocystic Odontogenic Tumor: Psychometric Study

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Abstract: The purpose of this study was to investigate degree of observer reliance (RD) on specific diagnostic elements in differential diagnosis of ameloblastoma (AB) and keratocystic odontogenic tumors (KOT) on panoramic images. The RD for 12 diagnostic elements, including 2 clinical and 10 radiographic elements, as recorded by eight dental radiologists on an ordinal ranking scale, was determined for 9 ABs and 9 KOTs. Intraobserver (IaOC) and inter-observer concordance (IeOC) for both ABs and KOTs were statistically analyzed in terms of RD. Significant differences in IeOC were also investigated between ABs and KOTs. The ranking of diagnostic elements was identified in each case of AB or KOT and classified according to IeOC. The mean rating scores of the 10 radiographic elements were then statistically compared and the RD for radiographic elements classified in each group. Good IaOC and IeOC were identified for the RD for the 12 diagnostic elements. IeOC differed significantly between the AB and KOT groups: the AB group showed higher concordance than the KOT group. Ameloblastoma lesion groups where IeOC was relatively high ($\chi^2 \geqslant 70$, $70 > \chi^2 \geqslant 60$) enabled ranking into four groups. Keratocystic odontogenic tumor lesion groups with χ^2 values of $\geqslant 50$ and <50 showed ranking into five groups and two groups, respectively. In particular, the AB lesion groups

showed a highly significant difference for the specified element of “adjacent radicular state”. In panoramic diagnosis, the RD of dental radiologists for diagnostic elements is more consistent for AB than for KOT. In particular, “radicular state adjacent to a lesion” may be an decisive element in distinguishing between AB and KOT.

Key words: Diagnostic elements, Panoramic studies, Psychometrics, Ameloblastoma, Keratocystic odontogenic tumor

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