Perbandingan akurasi gambaran radiografik lesi karies dini sebelum dan sesudah penggunaan filter pada digital imaging processor = Comparison of early caries radiographic image accuracy before and after filter using on digital imaging processor

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Abstrak

Latar Belakang: Sampai saat ini tingkat penyakit gigi dan mulut di Indonesia masih sangat tinggi yaitu 57,6% dari total populasi dan penyakit karies mencapai 88,8% dari jumlah tersebut. Terdapat beberapa metode untuk mendeteksi karies, dan salah satu metode yang paling sering digunakan adalah kombinasi pemeriksaan klinis dan pemeriksaan radiografis. Akan tetapi, lesi karies dini sering kali tidak terdeteksi. Saat ini computed radiography memiliki kelebihan yaitu dapat meningkatkan kualitas gambaran radiografik dengan menggunakan imaging tools berupa filter, yang diharapkan dapat meningkatkan akurasi deteksi lesi karies dini. Tujuan: Penelitian ini membandingkan akurasi gambaran radiografik tanpa filter dan penggunaan beberapa filter dalam digital imaging processor untuk deteksi lesi karies dini. Metode: Penelitian dilakukan dengan desain laboratorik eksperimental dengan metode uji diagnostik. Penelitian ini menggunakan lima set model gigi posterior, terdiri dari 16 gigi dengan 42 permukaan tidak memiliki karies, dan 36 permukaan dengan simulasi karies dini buatan. Data primer berupa gambaran radiografik tanpa filter dan menggunakan filter yang diperoleh dengan menggunakan digital imaging processor yaitu sistem storage phosphor plate Vistascan©. Seluruh gambaran radiografik tanpa filter, filter fine, caries 1, caries 2 dan HD (High Diagnostic) dinilai oleh tiga orang pengamat yang menyatakan ada atau tidak ada lesi karies dini. Hasil: Berdasarkan hasil uji statistik paired T-test, didapatkan hasil gambaran filter HD dan fine memiliki nilai sensitivitas yang lebih tinggi secara signifikan dibandingkan gambaran tanpa filter ($p < 0,05$). Gambaran filter caries 1 dan caries 2 tidak memiliki perbedaan yang signifikan dibandingkan dengan gambaran tanpa filter. Tidak terdapat perbedaan yang signifikan pada spesifisitas antara gambaran sebelum dan sesudah penggunaan filter. Nilai akurasi keseluruhan antara gambaran tanpa filter dan gambaran dengan filter meningkat secara signifikan hanya pada gambaran filter HD ($p < 0,05$). Kesimpulan: Gambaran filter HD menunjukkan nilai sensitivitas, spesifisitas, dan akurasi keseluruhan tertinggi diantara gambaran filter-filter yang ada dalam sistem Vistascan maupun gambaran tanpa filter. filter HD juga merupakan satu-satunya filter yang memiliki nilai akurasi keseluruhan lebih tinggi secara signifikan dibandingkan gambaran tanpa filter.

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Background: Until now, record of 57.6% of the total population in Indonesia has oral diseases, with caries lesion problems amounting to 88.8% of these diseases. This can be interpreted as caries being highly prevalent in Indonesia. There are some methods to detect caries lesion, with one of the most popular method being combined clinical and radiographic examination. Nevertheless, early caries lesion is frequently undetected. Computed radiography offers the privilege of original image quality enhancement through imaging tools such as filters and is expected to increase the accuracy of early caries lesion detection. Objective: The aim of this study was to compare the accuracy of original radiographic images, and images which have been enhanced with specific filters on digital imaging processor for detection of early caries

lesion. Methods: The type of research conducted was laboratory experiment research with diagnostic test methods. This research used 5 working model, containing 16 tooth with research 42 tooth surfaces were sound, and 36 had early caries lesions. Primary data were used in the form of radiographic images in several filters made by Vistascan storage phosphor plate system. All of the radiographic images were assessed by 3 observers who recorded the presence or absence of early caries lesions. Results: Using statistical paired T-test, the sensitivity of HD and fine filter images were significantly higher than the non-filter images ($p < 0.05$). The caries 1 and caries 2 images did not differ significantly than the original images. There is no significant difference between the specificity of original filter images and filter enhanced images. The overall accuracy between original filter images and filter enhanced images increased significantly only on HD filter ($p < 0.05$). Conclusion: HD filter showed the highest sensitivity, specificity, and overall accuracy from all other filters and the original images. Furthermore, HD filter is the only filter modalities that had significantly higher overall accuracy than the original images. Therefore, there is a significant increase in accuracy from the original images and filter enhanced images.