UNIVERSITI TEKNOLOGI MARA

THE IMPACT OF DENTAL OBJECTS WHICH CAUSE ARTIFACTS IN MRI HEAD AND NECK

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ABSTRACT

Purpose: To investigate the impact of dental objects worn by patient that causes artifacts in the MRI examination of head and neck.

Methodology: This study was a retrospective study to investigate the impact of dental objects which cause artifacts in magnetic resonance imaging of head and neck. The research was conducted using the DICOM system in the MRI room. About 40 images were obtained from the data storage containing MR images of head and neck from the year 2014 until 2015. Based on the acquired images associated with artifacts, research study was done to evaluate the extent of artifacts identified caused by various dental objects. Images were evaluated by senior radiographers in Hospital Pulau Pinang based on their working experience in the MRI department and mainly using absolute Visual Grading Analysis (VGA). Data collected were analyzed using independent t-test and one way ANOVA in SPSS. Differential analysis was required to evaluate the image quality of MR images in order to observe the statistical graph.

Results: The descriptive analysis showed that mean VGA score is higher in images without artifact compared to the images with artifact. Findings on the one way ANOVA analysis also revealed that dentures has the highest mean score followed by titanium implant and orthodontic appliances which is the least. The result of the one way ANOVA test showed that the p-value is less than 0.05 (0.001) proving there is a significant difference in terms of the extent of artifact by the three sources of dental objects.

Conclusion: Larger size of dental objects lead to larger size of the artifact. The visualization of important structures can be clearly demonstrated when the image quality is enhanced. Absence of artifact will indeed guaranteed a good image quality. Devices such as orthodontic appliances produce more significant artifact than the other two dental devices, dentures and titanium implants. Thus, the quality of MR image will be less valuable as important detail is missed and the image can be misinterpreted.

key word: image quality, MRI, artifacts, dental objects, head and neck

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