

Reliability of Diffusion Tensor Imaging in Differentiation of Salivary Gland Tumors

Authors : Sally Salah El Menshawy, Ghada M. Ahmed GabAllah, Doaa Khedr M. Khedr

Abstract : Background: Our study aims to detect the diagnostic role of DTI in the differentiation of salivary glands benign and malignant lesions. Results: Our study included 50 patients (25males and 25 females) divided into 4 groups (benign lesions n=20, malignant tumors n=13, post-operative changes n=10 and normal n=7). 28 patients were with parotid gland lesions, 4 patients were with submandibular gland lesions and only 1 case with sublingual gland affection. The mean fractional anisotropy (FA) and apparent diffusion coefficient (ADC) of malignant salivary gland tumors (n = 13) (0.380 ± 0.082 and $0.877\pm 0.234 \times 10^{-3} \text{ mm}^2 \text{ s}^{-1}$) were significantly different ($P < 0.001$) than that of benign tumors (n = 20) (0.147 ± 0.03 and $1.47\pm 0.605 \times 10^{-3} \text{ mm}^2 \text{ s}^{-1}$), respectively. The mean FA and ADC of post-operative changes (n = 10) were (0.211 ± 0.069 and $1.63\pm 0.20 \times 10^{-3} \text{ mm}^2 \text{ s}^{-1}$) while that of normal glands (n =7) was (0.251 ± 0.034 and $1.54\pm 0.29 \times 10^{-3} \text{ mm}^2 \text{ s}^{-1}$), respectively. Using ADC to differentiate malignant lesions from benign lesions has an (AUC) of 0.810, with an accuracy of 69.7%. ADC used to differentiate malignant lesions from post-operative changes has (AUC) of 1.0, and an accuracy of 95.7%. FA used to discriminate malignant from benign lesions has (AUC) of 1.0, and an accuracy of 93.9%. FA used to differentiate malignant from post-operative changes has (AUC) of 0.923, and an accuracy of 95.7%. Combined FA and ADC used to differentiate malignant from benign lesions has (AUC) of 1.0, and an accuracy of 100%. Combined FA and ADC used to differentiate malignant from post-operative changes has (AUC) of 1.0, and an accuracy of 100%. Conclusion: Combined FA and ADC can differentiate malignant tumors from benign salivary gland lesions.

Keywords : diffusion tensor imaging, MRI, salivary gland, tumors

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