

Color encoded Mapping in Tracheal Stenosis with Contrast-enhanced Dynamic MRI for the evaluation of Granulation and Fibrosis

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Purpose: To investigate the potential of Dynamic contrast enhanced MRI for mapping of granulation and fibrosis in tracheal stenosis

Materials and Method: Eight patients with tracheal stenosis confirmed by bronchoscope and biopsy underwent dynamic contrast-enhanced MR imaging. Dynamic MRI was performed on a 1.5-T Siemens vision system using the following parameters;TR-TE 7.6/2.1, matrix 160*512, field of view 188*300, 1.3mm slices and scan time of 25 sec. 15ml GD-DTPA was injected at a rate of 3ml/sec through the right antecubital vein by MR injector (Medrad USA). We obtained dynamic images of 5 serial phases and mapped the enhancement patterns of the granulation dominant and fibrosis dominant regions with signal intensity curves using the IDL(Interactive Data Language ; Research system inc, Colorado, USA) program. Each slope was compared with the signal intensity curve of the nasopharyngeal adenoid, known as the hypervascular structure. According to the relative position of the signal intensity curve of the granulation and fibrosis dominant regions with that of the adenoid, color encoding was assigned to the each region of the stenosis site.

Results: The signal intensity curve of the granulation dominant region was higher than that of the nasopharyngeal adenoid, but the fibrosis dominant region was lower. We obtained a color map which showed a yellow color for the granulation dominant region and a blue color for the fibrosis dominant region. Color encoded mapping was well correlated with bronchoscope and biopsy findings.

Conclusion: Color encoded mapping with dynamic contrast-enhanced imaging is a useful method for differentiation of granulation and fibrosis in tracheal stenosis patients.