

Dynamic MRI of Vocal Cords using Carotid Phased Array Coils.

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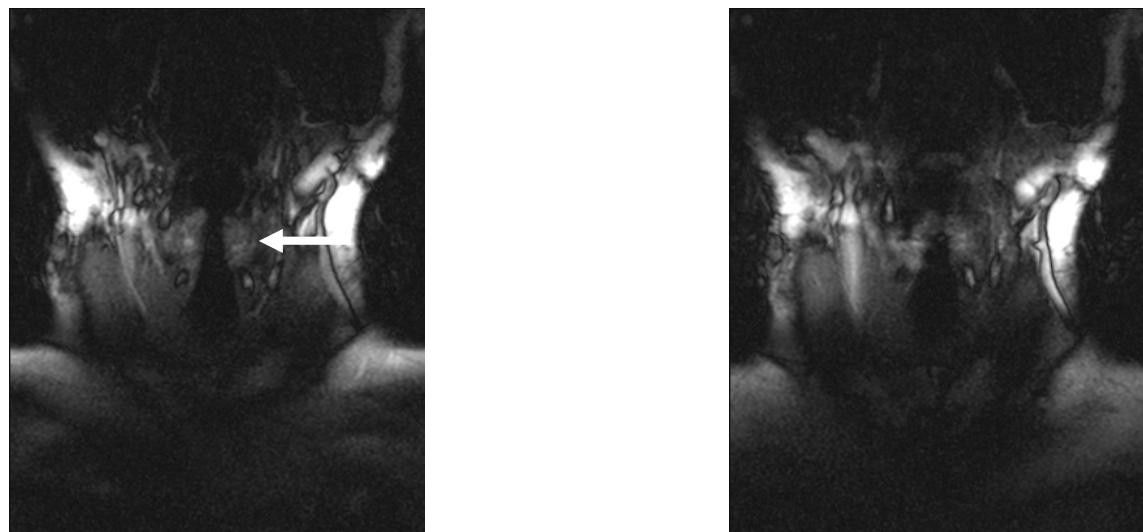
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Purpose: The aim of this study was the evaluation of a noninvasive method to assess the motility of the vocal cords in patients with hoarseness of unknown etiology.

Material and Methods: We included 12 patients (8 male, 4 female, age 25-75 years, mean age 62 years) with hoarseness. All exams were performed using a 1.5 Tesla scanner (Magnetom Sonata, Siemens Medical Erlangen, Germany) with a phased array carotid coil (Machnet BV, Eelde, The Netherlands). To detect the exact location of the vocal cords a T2 weighted coronal sequence was performed. Then a repetitive coronal real-time SSFP image (steady state precession sequence with balanced gradients) (TR 282 ms, TE 1.3 ms, FOV 235 x 117.5 mm², and a matrix of 128 x 128, resulting in a pixel size of 1.8 x 0.9 mm²) with a slice thickness of 4 mm and a temporal resolution of 4 images per second was acquired over 14 seconds first during silence and then while phonating the sound “heee”. MRI findings were compared to the results of the endoscopic examination.

Results: Dynamic MRI was able to detect all cases of paresis of the vocal cords (7 of 12 patients). The other patients had no paresis. Their hoarseness was caused by papillomas or tumors on the vocal cords, which partially could be detected by MRI, too.

Conclusion: Dynamic MRI with phased array carotid coils seems to be a promising noninvasive tool to detect motility disorders of the vocal cords.



SSFP sequence in the coronal plane: 69 year old male with hoarseness. (a) Only the right vocal cord is open during non-phonation/breathing; the left cord is fixed laterally (arrow). (b) Both vocal cords close during phonation. The left vocal cord remains fixed during both experiments.