

PRELIMINARY EXPERIENCE IN EVALUATION OF DISEASE SEVERITY AND ACTIVITY OF TAKAYASU ARTERITIS WITH WHOLE-BODY MRA AND VESSEL WALL IMAGING

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Introduction: Takayasu Arteritis is a systemic disorder which mainly involves medium- and large-sized arteries. As the disease progresses, many kinds of luminal pathology may appear, such as stenosis, occlusion and aneurysm. However, at an early stage, the vessel lumen often remains unchanged while inflammation or thickening of the vessel wall may already exist. Furthermore when the disease is active, the mural tissue may be avidly enhanced. Early diagnosis and comprehensive assessment of its severity and activity are required which may influence treatment procedure and outcome. Whole-body MRA has been used successfully in patients with atherosclerosis. In this study we further explored its ability for comprehensive diagnosis of Takayasu Arteritis with postcontrast vessel wall imaging.

Methods: Whole-body MRA was performed in 36 patients on a 1.5T MR scanner (Magnetom Avanto), which was equipped with high performance gradients. All patients received 0.25 mmol/kg of Gadopentetate dimeglumine (Magnevist). Image quality and depiction of vascular diseases of each station were assessed. In 20 of all patients pre-contrast and post-contrast high-resolution vessel wall imaging were also acquired. These 20 patients were divided clinically into two groups: active/persistent (n=15) and remissive group (n=5), according to the Birmingham Vasculitis Activity Score in 2003. Vessel wall thickness and postcontrast signal intensity of vessel wall relative to back muscle were analyzed.

Results: Whole-body MRA yielded a dedicated image of systemic and pulmonary artery. A total of 1583 arterial segments were assessed. The average score of visibility and venous contamination were 2.2 ± 0.05 and 0.77 ± 0.05 . In all patients, whole-body MRA depicted various pathological entities. Pulmonary hypoperfusion was also identified with or without pulmonary artery abnormalities. In 26 cases, these vessel lesions were located in multiple vessel territories that could not be included in mono-station MRA. Wall thickness of the active/persistent group ($5.9 \text{mm} \pm 1.19$) was thicker than the remissive group ($4.02 \text{mm} \pm 0.92$; $P=0.005 \ll 0.05$), and postcontrast signal intensity ratio was significantly different between two groups (active/persistent vs remissive, 1.57 ± 0.54 vs 1.18 ± 0.33 , $P=0.0006 \ll 0.05$). Based on the involved vessel territories and lung abnormality revealed by whole-body MRA, as well as the results of vessel wall imaging, the Lupi-Herrea classification was modified in 6 of 20 patients.

Conclusions: Whole-body MRA combined with vessel wall imaging had the potential for a comprehensive assessment of vessel involvement and activity of Takayasu arteritis, which may be very useful in its diagnosis and follow-up. It could be accomplished within a reasonable time and with a reasonable amount of contrast media.

References: 1. Johnston SL, et al. J Clin Pathol, 2002, 55:481-486. 2. Nael K, et al. AJR, 2007, 188:529-539. 3. Choe YH, et al. AJR, 2000, 175:505-511.