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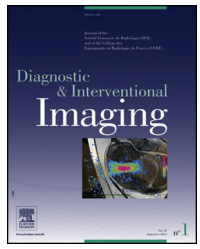

PICTORIAL REVIEW /*Musculoskeletal imaging*

Magnetic resonance arthrography of the wrist with axial traction: An iconographic review

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Abstract Stress maneuvers inspired by arthroscopic techniques have been previously studied for MRA of shoulder, hip, knee and wrist. Axial traction in MRA of the wrist is advantageous to study intrinsic ligaments and cartilage, but seems useless to assess tendons or nerves disorders. Based on our experience and a well-chosen iconography, we would like to emphasize the contribution of axial traction in MRA of wrist disorders.

Wrist cartilage and ligament disorders can be assessed by multidetector computed tomography (MDCT) arthrography, conventional magnetic resonance (MR) imaging and MR arthrography (MRA) [1]. MRA is effective to study both intrinsic and extrinsic ligaments as well as the triangular fibrocartilage complex (TFCC) of the wrist and is more accurate than conventional MRI [1,2]. MDCT arthrography may be superior because of its higher spatial resolution but it does not show marrow and soft tissue abnormalities as well as MRI [1]. Stress maneuvers that mirror arthroscopic techniques have been

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previously studied for MRA of shoulder, hip, knee or metatarsophalangeal articulations [3—6]. These maneuvers may also be useful in MRA of the wrist [7,8].

Based on our experience and carefully selected iconography, we would like to emphasize the contribution of axial traction in MRA of wrist disorders.

Technique and applications

After the opacification of the mediocarpal, radiocarpal and distal radioulnar joints in a sterile manner under fluoroscopic guidance (first injection with a 23-gauge needle in a sterile manner a few drops of iodinated contrast medium (Hexabrix® 320 mg — Guerbet, France) in the joint, then, diluted gadolinium-based medium (Artirem® — Guerbet, France): 2.5 mL in mediocarpal part, 1.5 mL in radiocarpal and radioulnar part), the patient is placed in the ''Superman'' position, prone with arm extension over the head and wrist in slight pronation using preferably a dedicated wrist coil, such as an 8-channel high-resolution wrist coil.

The easiest method to conduct axial traction is to use Chinese finger traps with a pulley system and weights (Fig. 1). Manual axial distraction of the wrist joint before placing the weight is essential: if manual distraction is not correctly performed prior the exam, response to traction may be poor (Fig. 2). In our centre, we use a 3 kg weight and 3 digits trapped with very good tolerance by patients [9]. On a 1.5-Tesla MR scanner (Twin Speed HDX: GE® Healthcare), coronal DPFS (TR: 2106; TE: 58; Nex: 4; FOV: 11 × 11 cm; matrix: 416 × 320; slice: 2 mm; gap: 0.3 mm; time of acquisition:

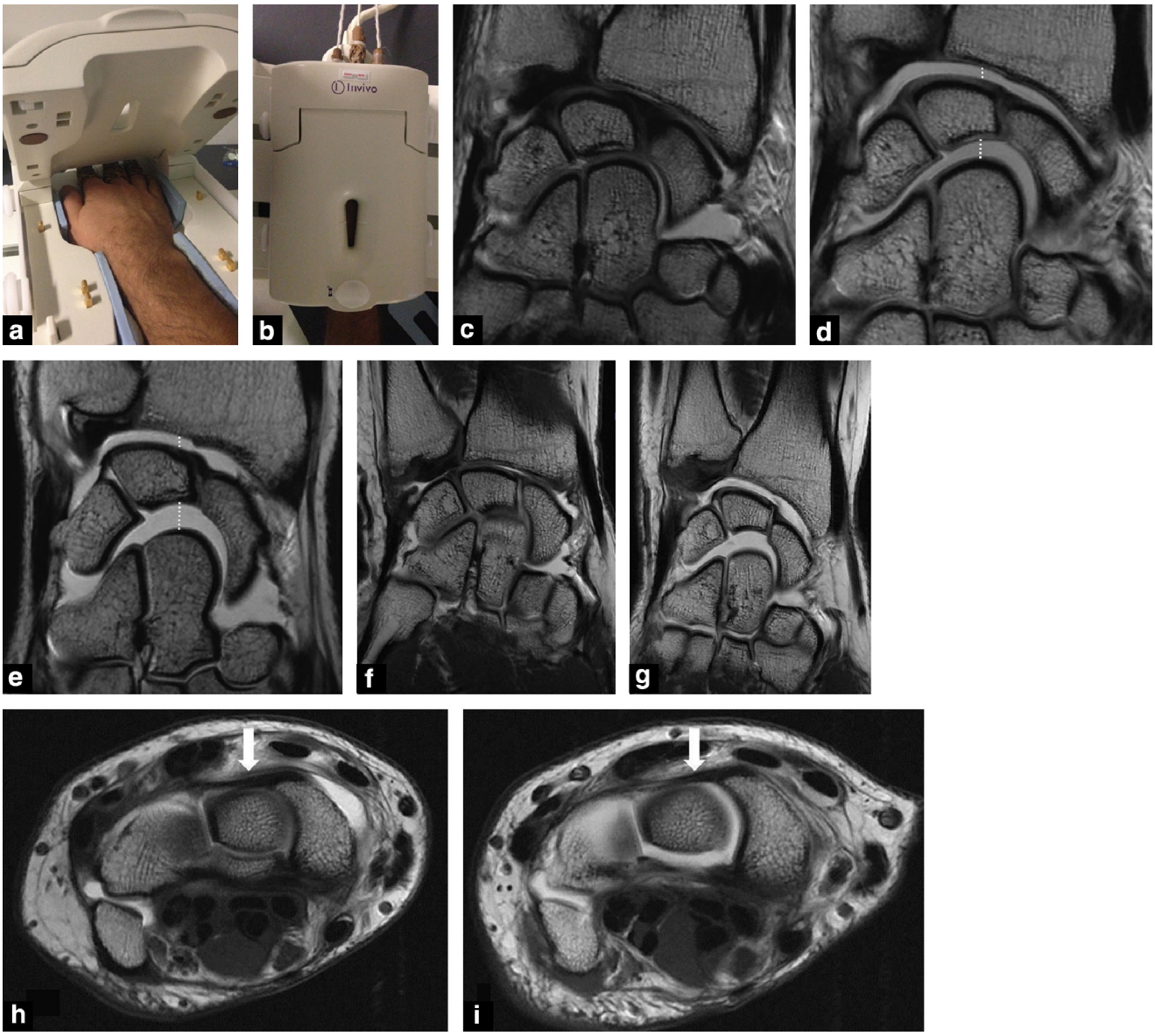

Figure 1. Normal wrist MRA. Wrist supine position with Chinese finger traps with a pulley system (a and b). Coronal T1-weighted wrist MRA in three different patients without traction (c) and with good (d) and excellent (e) response to axial traction. Coronal T1-weighted wrist MRA in the same patient without (f and h) and with traction (g and i) in coronal and axial plane (scapho-triquetral dorsal ligament: arrow).