

Agreement Between Ultrasound and Radiography for the Detection of Rhizarthrosis

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Background/Purpose: Trapeziometacarpal (TMC) joint is a common site of osteoarthritis (OA)(rhizarthrosis). Its diagnosis is based on clinical and radiological (X-ray) features. It is not clear the usefulness of ultrasound (US) for the diagnosis of rhizarthrosis. The objective of the present study was to evaluate the utility of US for the diagnosis of rhizarthrosis, compared with X-ray.

Methods: A retrospective analysis of all consecutive patients who had undergone X-ray and US of both hands, no more than 30 days apart, between January 2012 and December 2014 was performed. Demographic and clinical data were recorded. All US examinations were performed by an experienced rheumatologist, blinded to X-ray data, using a MyLab 70 (Esaote) machine provided with 6-18 MHz broad band multifrequency linear transducer. TMC joint was evaluated for the presence of osteophytes, defined as protrusions of cortical bone from the margins of the joint observable in two perpendicular planes. US findings at TMC joint were also graded on a 0 to 3 scale (0= absence of degenerative changes; 1= mild : presence of osteophytes \leq 2 mm; 2= moderate: presence of osteophytes $>$ 2 mm; 3= marked: presence of osteophytes $>$ 2 mm associated with loss of normal joint architecture). X-rays were read by another experienced rheumatologist, blinded to US data, to determine the presence of asymmetrical joint space narrowing and/or osteophytes at TMC joint. Using Eaton's criteria, X-ray rhizarthrosis was also graded from 1 to 4 (Stage 1: Normal joint space or slight widening. Subluxation $<$ 1/3; Stage 2: Decreased TMC joint space. Small ($<$ 2 mm) osteophytes or loose bodies. Subluxation $<$ 1/3; Stage 3: More decreased TMC joint space. Subchondral cysts or sclerosis. Osteophytes or loose bodies \geq 2 mm. At least 1/3 of subluxation; Stage 4: Stage 3 in addition to involvement of the scaphotrapezial joint).

Results: A total of 378 TMC joints from 189 patients were included for the final analysis. One hundred twenty-eight (67.7%) patients were female and mean age (SD) was 64.1 (14) years. X-ray and US diagnosis agreed in 365 out of 378 (96.5%) TMC joints (figure 1). In 71 TMC joints both imaging methods disregarded OA and in 294 both methods confirmed the diagnosis of rhizarthrosis (unweighted kappa value: 0.895 ;95% CI: 0.84-0.95). Intraclass correlation coefficient for rhizarthrosis grades for both imaging modalities was 0.9 (95% CI: 0.88-0.92). Table shows the distribution of Eaton's X-ray stages and US grades of rhizarthrosis.

Conclusion: US and X-ray showed an excellent agreement for the diagnosis of rhizarthrosis and excellent correlation for the severity of the involvement. US might be used for the diagnosis and severity classification of OA of the TMC joint.

Table. Distribution of Eaton's X-ray stages and US grades of rhizarthrosis.

		US				
		Grade 0	Grade 1	Grade 2	Grade 3	
X-ray	Stage 0	71	9	2	0	82
	Stage 1	2	60	1	4	67
	Stage 2	1	111	6	5	123
	Stage 3	0	2	45	37	84
	Stage 4	0	0	0	22	22
		74	182	54	68	378

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