

:

: 2002 6 2004 12
(n=92)

: 100%, 64%
80% 94% 100%,
90% 61% 95%
(kappa value, 0.644 and 0.911).

:

가

33

가
가

1 (n = 23),
2 (n = 33),
3 (n = 82)
2
3

1

가

가 (1-6).

. 5 - 12 MHz
(anterior transverse view)

(coraco - acromial view) (lat -
eral coronal view)
(posterior transverse view)

2002 6

2004 12

가

92

. 92

82

가

(double cortex sign)

(partial - thickness tear)

1
2

2005 5 2

2005 6 22

(full - thickness tear)

15 - 25 ml

(40 cc normal saline, 10 cc Lidocaine, 0.2 cc Gadolinium, 0.4 cc Epinephrine)

가

가

(partial -

(Amedic AB , Sollentuna, Sweden, U.S.A.)

2% lidocaine 10 ml

thickness tear)

. 22 gage, 10 cm

(Echotip , Cook Incorpo - rated,

가

가

Bloomington, U.S.A.)

(full -

Table 1. The Results of Ultrasonographic Depiction of Rotator Cuff Tendon Tear Comparing with Arthroscopic Findings

Tendon	Tear	Sensitivity (%)	Specificity (%)	Pp (%)	Np (%)	Accuracy (%)
SSP	FT+PT	12/12 (100)	7/11 (64)	12/16 (75)	7/7 (100)	19/23 (82)
SSP	PT	4/4 (100)	12/19 (63)	4/11 (36)	12/12 (100)	16/23 (70)
SSP	FT	5/9 (56)	13/14 (93)	5/6 (83)	13/17 (76)	18/23 (78)
SSC	FT+PT	3/3 (100)	18/20 (90)	3/5 (60)	18/18 (100)	21/23 (91)

FT: Full-thickness tear, PT: Partial-thickness tear, Pp: Positive predictability, Np: Negative predictability, SSP: Supraspinatus tendon, SSC: Subscapularis tendon, Fisher 's exact test: $p < 0.05$ in all comparisons

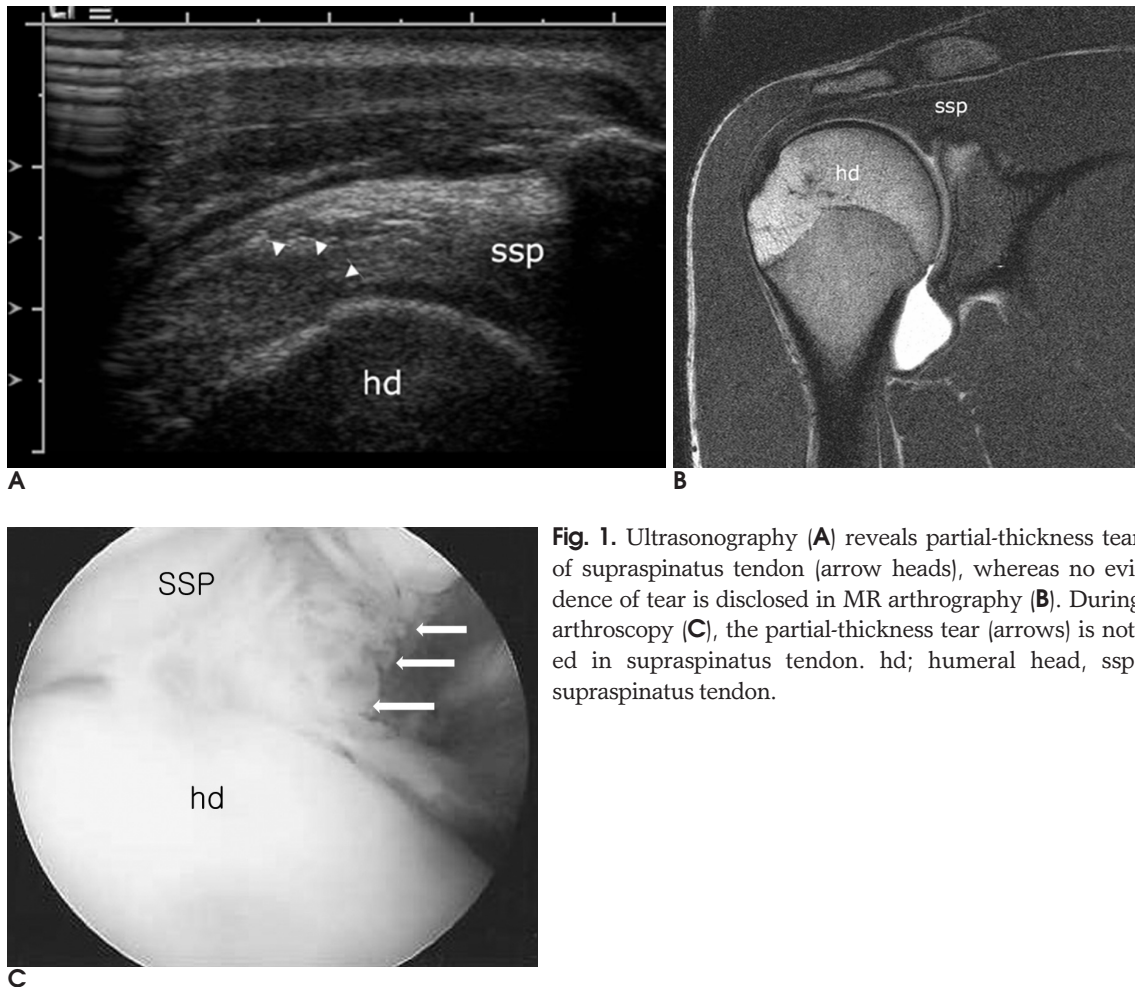


Fig. 1. Ultrasonography (A) reveals partial-thickness tear of supraspinatus tendon (arrow heads), whereas no evidence of tear is disclosed in MR arthrography (B). During arthroscopy (C), the partial-thickness tear (arrows) is noted in supraspinatus tendon. hd; humeral head, ssp; supraspinatus tendon.

Table 2. The Feasibility of MR Arthrography in Diagnosis of Rotator Cuff Tear and Glenoid Labral Injury Based on Arthroscopic Findings

	Sensitivity (%)	Specificity (%)	Pp (%)	Np (%)	Accuracy (%)	Fisher's exact test
labrum	18/19 (95)	9/14 (64)	18/23 (78)	9/10 (90)	27/33 (82)	$p < 0.05$
SSP	12/15 (80)	17/18 (94)	12/13 (92)	17/20 (85)	29/33 (88)	$p < 0.05$
SSC	1/3 (33)	29/30 (97)	1/2 (50)	29/31 (94)	30/33 (91)	$p > 0.05$

Pp: Positive predictability, Np: Negative predictability, SSP: Supraspinatus tendon, SSC: Subscapularis tendon

Table 3. Accordance Between Ultrasonography and MR Arthrography During Depiction of Rotator Cuff Tear

	US	MRAr	Kappa	Fisher's exact test
SSP tear	55/82 (67%)	40/82 (49%)	0.347	$p = 0.001$
SSC tear	18/82 (22%)	13/82 (16%)	0.644	$p < 0.001$
FT tear	27/246 (11%)	23/246 (9%)	0.911	$p < 0.001$
PT tear	46/246 (19%)	19/246 (8%)	0.292	$p < 0.001$
RC tear	73/246 (30%)	55/246 (22%)	0.602	$p < 0.001$

Any tear of either SSP or ISP muscle was compared between US and MRAr. Regardless of rotator cuff muscles, the depiction of FT and PT tendon tear was also compared between two imaging modalities. Any tear in any rotator cuff muscle was also compared between two imaging modalities.

US: Ultrasonography, MRAr: MR arthrography, SSP: Supraspinatus, SSC: Subscapularis, FT: Full thickness, PT: Partial thickness, RC: Rotator cuff, ISP: Infraspinatus

thickness tear)

(labrum tear)

1 2

(standard reference)

Cross Table Chi - square

Kappa value

Fisher's exact test

1 ($n = 23$)

16

5

7

64%

($p < 0.01$).

100%

100%

90%

($p < 0.01$) (Table 1, Fig. 1).

2 ($n = 33$)

13

, 23

3

80%

94%

($p <$

33%

0.05).

97%

가

($p > 0.05$) (Table 2).

3 ($n = 82$)

Kappa value

0.347

0.644

(kappa value =

0.911)

(kappa value=0.292) (Table 3).

가

3

10 - 60

3

가

(7).

가

가

(8).

가

(4 - 6, 9).

(8).

Labanauskaite (10) 31

80%,

100%,	100%,	82%	가	91%	93%
	79%, 82%, 85%, 75%		가		82% 98%
	가			(over - interpretation)	가
	가				
		가			가
가				가	
			가		
Roberts (11)			가		
				(internal degenerative change)	
Ziegler (3)	282				가
			(overestimation)가		
가	99.6%, 85.7%, 99.6%, 85.7%		가		가
	가	가			
	가			(screening test)	
				가	가
Yamakawa (12)	Evancho (8)		가		
		Yamakawa			
	85%, 83%, 99%	83%, 85%,			
39%	Evancho				
	80%, 94%, 89%;	69%,			
94%, 84%					
Teefey SA (13)					
		retrac -			
tion					
(Accuracy)	73% 63%				
	85% 75%				
가	87% 80%		가		
	54% 75%				
		(p>0.05).			
가	Palmer (14)	Waldt (6)			

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Feasibility of Ultrasonography and MR Arthrography during Evaluation of Rotator Cuff Injury¹

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Purpose: To evaluate the feasibility of MR arthrography and ultrasonography in evaluating shoulder pain.

Materials and Methods: The subject group consisted of all patients who visited our institute complaining of shoulder pain or instability from June 2002 to December 2004. There were a total of 92 patients with a mean age of 48. On the basis of arthroscopic results, the sensitivity, specificity, and accuracy of ultrasonography and MR arthrography were evaluated by comparing them with each other.

Results: In the diagnosis of supraspinatus tendon tears, ultrasonography had sensitivity and specificity of 100% and 64%, respectively, whereas MR arthrography had sensitivity and specificity of 80% and 94%, respectively. Ultrasonography also had high sensitivity and specificity in the diagnosis of subscapularis tendon tears (100% and 90%). MR arthrography was appropriate for identifying glenoid labral abnormalities (sensitivity, 95% and specificity, 61%). Similar results from ultrasonography and MR arthrography were obtained in the diagnosis of subscapular tendon tears or full-thickness tears of the rotator cuff tendons (kappa value, 0.644 and 0.911).

Conclusion: While evaluating rotator cuff abnormalities, ultrasonography was appropriate for screening, whereas MR arthrography was useful to confirm the results of the ultrasonography.

Index words : Shoulder, US
Shoulder, MR
Shoulder, arthrography

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