

The Bear Hug Test Improves Sensitivity Compared to the Belly Press Test for Identifying Subscapularis Tendon Tears but Both Tests Miss the Majority of Partial Tears

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INTRODUCTION: Identifying subscapularis (SSC) tears on physical exam can be challenging. The aim of this investigation was to evaluate the performance of the bear hug (BH) and belly press (BP) tests in diagnosing SSC tears, and to explore the influence of tear size and related pathologies on the accuracy of these tests.

METHODS: A retrospective review was conducted on prospectively maintained data on patients who underwent arthroscopic rotator cuff repair (ARCR) of SSC tears between 2011 and 2021. A control group was also obtained of ARCRs with an intact SSC tendon. All examinations and ARCRs were performed by one high-volume shoulder surgeon. The BH test and BP test results were compared to arthroscopic findings as the gold-standard diagnostic modality. Tear type was classified based on the Lafosse classification. Sensitivity, specificity, positive and negative predictive values, false positive and false negative rates, and accuracy were calculated for both tests.

RESULTS: A total of 1,122 patients were included for analysis, 866 with intraoperatively confirmed SSC tears (77%) and 256 without (23%). The BH test diagnosed SSC tears with a sensitivity of 46.1% and a specificity of 83.2%, whereas the BP test diagnosed tears with a sensitivity of 23.3% and a specificity of 93.4%. Overall, both tests missed SSC tears in 42.3% (n=475) of cases. The BH test had accuracy rates of 25.9% for SSC type I tear, 48.7% for type II tear, 65% for type III tear, and 81.7% for type IV-V tear. In contrast, the BP test had accuracy rates of 7.6% for type I tear, 14.7% for type II tear, 42% for type III tear, and 68.7% for type IV-V tear.

DISCUSSION AND CONCLUSION: The BH test is more sensitive than the BP test in identifying SSC tears, but still missed about half of the tears. Both tests demonstrated greater diagnostic accuracy with increasing SSC tear size.

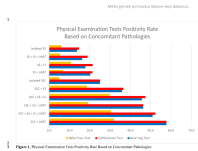


Figure 4. Physical Examination Tests' Specificity Rate based on Concomitant Pathologies.

Table 1. Descriptive statistics of patients with acute and chronic acromioclavicular joint arthropathy.

Parameter	Acute	Chronic	P-value
Number of patients	142	136	
Age (mean)	58.7	61.3	.04
Sex (M/F)	104/38	95/41	.16
Side (L/R)	68/74	60/76	.52
Duration (mean)	1.2	10.1	<.001
Cause			
Trauma	104	78	
Degenerative	38	58	
Infection	0	0	
Idiopathic	0	0	
Other	0	0	
Unknown	0	0	
Total	142	136	
Mean (SD)	1.2 (0.8)	10.1 (8.5)	
Median (IQR)	0 (0-2)	5 (1-15)	
Range	0-10	0-40	
Maximum	10	40	
Minimum	0	0	
Standard deviation	0.8	8.5	
Interquartile range	0-2	1-15	
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Table 2. Diagnostic value of Bear Hug Test, Belly Press Test and their combination for detecting arthropathy.

Test	Se	Sp	PPV	NPV
Bear Hug	0.461	0.832	0.714	0.493
Belly Press	0.233	0.934	0.687	0.343
Both	0.694	0.901	0.812	0.612

Table 3. Diagnostic value of Bear Hug Test, Belly Press Test and their combination for detecting arthropathy.

Test	Se	Sp	PPV	NPV
Bear Hug	0.461	0.832	0.714	0.493
Belly Press	0.233	0.934	0.687	0.343
Both	0.694	0.901	0.812	0.612

Table 4. Diagnostic value of physical examination tests in identifying arthropathy according to arthropathy.

Arthropathy	Test	Se	Sp	PPV	NPV
Acute	Bear Hug	0.461	0.832	0.714	0.493
	Belly Press	0.233	0.934	0.687	0.343
Chronic	Bear Hug	0.694	0.901	0.812	0.612
	Belly Press	0.694	0.901	0.812	0.612

AC Joint Arthropathy, AC = acromioclavicular joint; Biceps Tear, Biceps tendon tear; Labrum Tear, Labrum tear; Rotator Cuff Tear, Rotator cuff tear; Full Thickness Rotator Cuff Tear, Full thickness rotator cuff tear.

Se = sensitivity; Sp = specificity; PPV = positive predictive value; NPV = negative predictive value.

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