

# THE TORT TEST IN THE DIAGNOSIS OF FULL-THICKNESS ROTATOR CUFF TEARS



Pedro Tort Saade, MD, Julio Nerys Figueroa, Patricia Serrano Boett  
Tort Orthopaedic Institute, Universidad Central del Caribe- School of Medicine, PR  
Email: ptortsaade@gmail.com, 119jnerys@uccaribe.edu, 120pserrano@uccaribe.edu



## INTRODUCTION

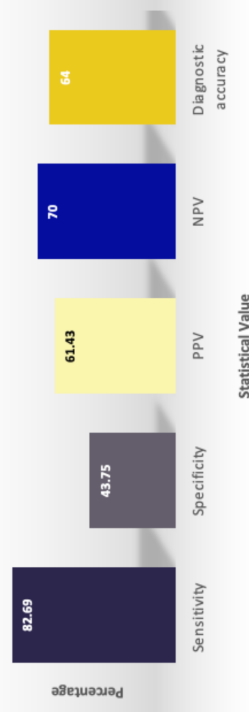
An most rotator cuff pathology physical examination tests, the sensitivity, specificity, and diagnostic accuracy in identifying a full-thickness tear are suboptimal. The purpose of this study is to introduce the Tort Test, a modification of the rent test, to determine the sensitivity, specificity, negative predictive values (NPV), positive predictive value (PPV), and diagnostic accuracy. We hypothesize that the Tort test is valuable in identifying a full-thickness rotator cuff tear. It's straightforward, easy to perform and reproduce, and could gain widespread use.

## METHODOLOGY

A prospective analysis was done on 164 consecutive patients (81 females, 71 males) with complaints of shoulder pain. The Tort test is performed by placing the patient's arm in 0 degrees of abduction, neutral rotation, and the elbow flexed to 90 degrees. One of the physician's hands is placed palpating the lateral aspect of the humeral head just below the acromion, and the other hand holding the patient's proximal forearm, which will control internal and external rotation. The patient is asked to relax, and the shoulder is rotated several times between 45 degrees of internal and external rotation. The Tort test was termed positive when either crepitus, pain, or both crepitus and pain were appreciated during the evaluation and were divided into tree groups respectively. Physical examination results of the affected side were compared to the magnetic resonance imaging (MRI) or ultrasounds. The test should be performed bilaterally to compare it with the asymptomatic arm. This study was IRB approved at the Larking Community Hospital with protocol number LCH-7-052019.

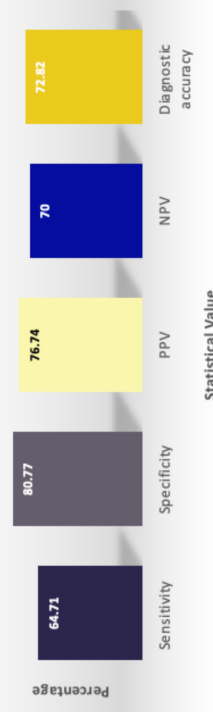
## RESULTS

Graph 1. Tort Test results when both pain and creptance are considered



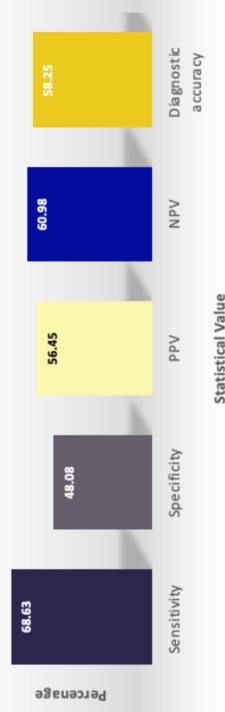
Graph 1. When both pain and creptance were considered in the Tort Test, the sensitivity was 82.69%, specificity 43.75%, PPV 61.43%, NPV 70%, and diagnostic accuracy of 64%.

Graph 2. Tort Test results when only creptance is considered



Graph 2. When only creptance was considered, the Tort test sensitivity was 64.71%, specificity 80.77%, PPV 76.74%, NPV of 70.0%, and diagnostic accuracy for creptance 72.82%

Graph 3. Tort Test results when only pain is considered



Graph 3. When only pain was considered, the sensitivity was 68.63%, specificity 48.08%, PPV 56.45%, NPV 60.98%, and diagnostic accuracy 58.25%.

## DISCUSSION

Of the 164 shoulders evaluated, 51 had full-thickness rotator cuff tear and the rest had either partial tears or were negative. The data gathered demonstrated that the Tort test had a high sensitivity (82.69%) when both pain and creptance were present but had a low specificity (43.75%). Similarly, when only pain was present during the maneuver, it had a sensitivity of (68.63%) and again low specificity (48.08%). In contrast, when only creptance was present the sensitivity was less (64.71%) but had higher specificity (80.77%) indicating fewer false-positive results. Consequently, it also had a higher PPV (76.74%) meaning that it has a higher probability of having a full-thickness rotator cuff tear when creptance was present during the maneuver. However, to our surprise, the NPV (70%) was the same when compared with the pain and creptance group (70%) but higher than the pain group (60.98%). Ultimately, the creptance group has higher diagnostic accuracy (72.82%) than the other two groups (64%, 58.25%), indicating a higher potential for diagnosing full-thickness rotator cuff tears. This means that pain is a subjective variable thereby increasing the likelihood of a false-positive result when diagnosing a full-thickness rotator cuff tear when other common shoulder pathologies such as impingement or osteoarthritis are present.

## CONCLUSION

Our study demonstrated that the Tort Test is valuable at identifying rotator cuff tears. Results showed that the test was most effective when creptance was considered independently of other variables, having the highest specificity, PPV, NPV, and diagnostic accuracy. The Tort test has a significant clinical value in accurately identifying full-thickness rotator cuff tears. Further evaluation and comparison studies are required to improve the clinical physical examination abilities to accurately identify a full-thickness rotator tear.

## ACKNOWLEDGMENTS

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