

# Editorial Commentary: Does the Morphology of the Acromion Explain All Rotator Cuff Tears?



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**Abstract:** Given the high prevalence of rotator cuff tears and their socioeconomic impact, surgeons and researchers have tried to understand their etiology and pathomechanism for almost hundred years. Articles about tendon degeneration with increasing age dominate the literature, and numerous factors contributing to tendon degeneration have been identified. One of them, the lateral extension of the acromion, as quantitated using the acromion index or the critical shoulder angle, has become very popular in the last few years. Other big tendons in the human body, such as the distal biceps tendon, the Achilles tendon, or the patellar tendon, are also subject to degenerative changes, but they normally do not lose their continuity without a relevant trauma. This raises 2 questions: What makes the rotator cuff different from the other tendons, and why are there not more rotator cuff tears related to a trauma? What we do know is that risk factors for rotator cuff tear include trauma, dominant arm, and age, whereas the effect of a large acromion is more ambiguous.

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One particularity of the rotator cuff is its complex deformation during shoulder movements, necessitating a high degree of flexibility of its tendons. Another particularity is the presence of the acromion, which covers the most vulnerable part of the rotator cuff. Many researchers have therefore tried to relate rotator cuff tears to the morphology of the acromion. In their meta-analysis “Is Bony Morphology and Morphometry Associated With Degenerative Full-Thickness Rotator Cuff Tears? A Systematic Review and Meta-analysis,” Andrade, Lucinda, Nunes, Xará-Leite, Calvo, Espregueira-Mendes, and Sevivas<sup>1</sup> analyzed 34 studies comprising 5916 shoulders and 19 potential risk factors for degenerative full-thickness rotator cuff tears. They found moderate evidence that 4 of these parameters are significantly associated with such lesions: a larger critical shoulder angle,<sup>2</sup> a higher acromion index,<sup>3</sup> a lower lateral acromion angle,<sup>4</sup> and an acromion type III.<sup>5</sup> It should be noted that both the critical shoulder angle and the acromion

index quantify the lateral extension of the acromion with respect to the glenoid plane and that they are not independent variables.<sup>6</sup> Combining them in a single analysis would maybe provide even better evidence. How a large acromion contributes to rotator cuff lesions needs to be clarified. One hypothesis is that increased subacromial pressure alters the microstructure and the flexibility of the tendons.<sup>6</sup>

Tendon degeneration alone, however, does not explain all rotator cuff tears. In many cases, a trauma causes the tendon rupture. About 60% of my patients report a trauma, most often a fall, and in many cases an acute rotator cuff tear remains unrecognized in an emergency department or in the office of a general practitioner.<sup>7</sup> In this context, one should consider what Yamamoto et al.<sup>8</sup> noted in their frequently cited study about the prevalence of rotator cuff tears: “The risk factors for rotator cuff tear included a history of trauma, dominant arm and age.”

## References

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The author reports the following potential conflict of interest or source of funding: personal fees from Aston Medical and personal fees from Mathys Medical, outside the submitted work. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

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0749-8063/19973/\$36.00

<https://doi.org/10.1016/j.arthro.2019.08.009>

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