



## Reply to the Park and Lee regarding: “Effects of joint capsular release on range of motion in patients with frozen shoulder”

### *In reply:*

Thank you for your interests in our recent work and kind questions. We would like to reply to each of the points raised.

Question 1: Different from cadaveric studies, it is difficult to completely immobilize the scapula as well as to evaluate scapular motion during range of motion (ROM) evaluation of the shoulder in a beach chair position. Too much pressure on the acromion could induce skin damage or too much force on the upper arm during ROM evaluation could damage the intra-articular structures. ROM is quite important for evaluating shoulder function. However, there have been no consensus methods for evaluating ROM regardless of scapular fixation. Furthermore, shoulder ROM is affected by not only the joint capsule but also by muscle contraction and flexibility even under general anesthesia, which typically involves a muscle relaxant. Muscular effects on shoulder ROM should be considered in future studies.

Scapular motion is possible during the ROM evaluation with our procedure. However, our study indicated that the other directions of ROM, except for forward flexion and lateral elevation, could reflect capsular changes.

Question 2: As you mentioned, it is difficult to distinguish the rotator interval, coracohumeral ligament (CHL), and superior glenohumeral ligament from each other in normal cadaveric studies. Furthermore, contracted adhered capsular tissues are prominent in patients with frozen shoulders, which makes it more difficult to identify anatomic structures. During a release of the rotator interval, CHL, and superior capsule in our procedures, it may be possible to release a part of the CHL in each step. In our recent manuscript, we defined CHL “with or without entire release.”<sup>1</sup> We also evaluated the effects of CHL release on ROM.<sup>2</sup>

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DOIs of original article: <https://doi.org/10.1016/j.jse.2020.11.019>,  
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