Background A decrease in dominant shoulder internal and total rotational range of motion (ROM) has been found in tennis players immediately after competitive play. This can become a risk factor for shoulder injuries if certain thresholds are reached. The adaptation is theorised to result from follow through of the serve, requiring the shoulder to decelerate through eccentric action of external rotators. This theory has not been confirmed by empirical research comparing serving to groundstrokes.

Objective To investigate the immediate effects of serving on shoulder rotational ROM in tennis players by comparing to groundstrokes.

Design Same-subject, randomised, crossover design.

Setting International High Performance Tennis Centre.

Participants Eighteen male and 12 female professional and university tennis players.

Interventions Participants undertook both serving and groundstroke interventions (involving 120 tennis balls) in a randomised order.

Main Outcome Measurements Passive glenohumeral internal and external rotation ROM measurements, using a digital inclinometer, were undertaken at baseline and immediately following serving and groundstroke interventions on both dominant and non-dominant shoulders. Total rotation was calculated as the sum of internal and external rotation.

Results On the dominant and non-dominant shoulders there was no significant interaction effect between the factors of tennis intervention (serving and groundstrokes) and time (pre and post) (p = <0.05). Indicating that change in rotational ROM was not specific to tennis intervention. On the dominant shoulder there was a significant main effect of time (p = 0.007), with internal, external and total rotational ROM decreasing irrespective of tennis intervention.

Conclusions Both tennis interventions resulted in immediate significant reductions in shoulder rotational ROM on the dominant shoulder but not the non-dominant shoulder of professional and university tennis players. These were within normal ranges that do not present risk factors for shoulder injuries. There was no significant difference between serving and groundstroke interventions. This might be an important consideration when planning tennis training.