Rotator cuff morphometry on MRI: an observational study in Indian population

Dr. Suresh Perumal,
Dr. Prakash Ayyadurai,
Dr. Janani Gopalakrishnan,
Dr. Vikram Rao,
Prof. S. Arumugam

Center for Sports Science,
SRIHER, Chennai, India
FACULTY DISCLOSURE

- Name: Dr. Suresh Perumal
- Qualification: M. S (Orthopaedics)
- NO financial conflicts to disclose
- NO Company affiliations

Name of employing institute:
Center for Sports Science (CSS)
Sri Ramachandra Institute of Higher Education and Research
Chennai, India
AIM

• To estimate normative dimensions of rotator cuff muscles on MRI to better understand the anatomy with reference to Indian population.

BACKGROUND

• Supraspinatus tears are seen across all age groups.
• Predominantly of traumatic etiology in the younger and degenerative in the older.
• Retraction can occur following a complete tear.
• The amount of retraction is a key feature in deciding the surgical technique to be followed.
• Therefore a normative value of the distance of the musculotendinous junction of the muscle and its point of insertion will provide a reference for comparison.
PREVIOUS STUDIES


Cadaveric study - three dimensional assessment.

Findings: (average)

subscapularis (SC): 40 × 20 mm; infraspinatus (IS): 29 × 19 mm;
supraspinatus (SS): 23 × 16 mm; and teres minor (TM): 29 × 21 mm.
MATERIALS AND METHODS

- MRI of 50 individuals with normal rotator cuff findings were assessed.
- T1 weighted images were used to visualize the normal anatomy.
- PDFS images were preferred when available.
- The supraspinatus tendon length was measured on the coronal section.
- The width of supraspinatus and the infraspinatus tendon were measured on the sagittal section in the most observable slice before the point of insertion.
- Length of the Subscapularis tendon was measured on axial section.
- Footprint dimensions were measured for both the muscles.
- All the measurements were done by a single senior musculoskeletal radiologist.
INCLUSION CRITERIA

- Individuals with skeletal maturity.
- Both male and female
- With a normal rotator cuff morphology - who had taken MRI for other pathologies of the shoulder, example Bankart lesion, were included for the study.

EXCLUSION CRITERIA

Individuals with pathologies of the rotator cuff:

- Tendinitis
- Partial tear
- Complete tear

DEMOGRAPHY

- 50 individuals - 42 male, 8 female
- Average age - 30.2 years
SUPRASPINATUS

Distance of MT junction from Point of insertion

Footprint width
SUPRASPINATUS AND INFRASPINATUS

COMBINED FOOTPRINT
SUBSCAPULARIS

TENDON LENGTH

WIDTH OF FOOTPRINT
RESULTS

- The average distance between the musculotendinous junction of the supraspinatus and its point of insertion was found to be 3.03 cm.
- The average footprint of the supraspinatus was found to be 1.33 cm.
- The combined width of supraspinatus and infraspinatus on the sagittal section was found to be 4.74 cm.
- The average subscapularis tendon length and footprint were found to be 3.37 cm and 1.64 cm respectively.
DISCUSSION

- Data obtained provides an idea of the normative values in the Indian population.
- MRI evaluation is more feasible compared to cadaveric dissection.
- Cadaveric evaluation is superior in accuracy of measurement.
- A larger sample size of the MRI study will provide a more accurate data.
CONCLUSION:

- These values of the study population belonging to a specific geographical area provides the normative data for analysis. Hence understanding tear morphology and individualizing repair techniques will become relevant with reference to the concerned demographics.

- The rotator cuff footprint dimensions were found to be smaller in the Indian population compared to the available cadaveric study.
References