Factors affecting clinical results of re-tear cases after arthroscopic rotator cuff repair for large and massive rotator cuff tear

[1] Department of Orthopaedic Sports Medicine, Imamura General Hospital

[2] Department of Orthopaedic Surgery, Tenyoukai Central Hospital

[3] Department of Orthopaedic Surgery, Fujimoto General Hospital

[4] Health Service Center, National Institute of Fitness and Sports in Kanoya

Hideyasu Kaieda[1], Hironori Kakoi[2], Toshihiko Izumi[3], Naohiro Uezono[1], Keiji Maesono[1], Kaori Fukushima[1] , Hamasato Yujiro[1], Yasunari Fujii[4]

ISAKOS:2023 Congress in Boston, USA

COI Disclosure Information

Presenter:　Hideyasu　Kaieda

I have no financial relationships to disclose.

Background

- Recently the clinical outcomes after arthroscopic rotator cuff repair (ARCR) have improved, but re-tear cases exist
- Factors affecting clinical results of re-tear cases were unknown

Purpose

To investigate the factors that influence the clinical outcomes of re-tear cases after ARCR

Methods

Subjects

28 shoulders (re-tear cases) /108 shoulders

All rotator cuff tears(large or massive tear) had been repaired arthroscopically.

Re-tear rate : **25.9%**

Average age at the time of operation : **68.4y/o**（50～79）

Average postoperative follow-up period : **20.6M**（12～24）

24 shoulders （Group N）didn’t need reoperation

4 shoulders （Group R）needed reoperation

Examination items

- Age at the time of operation
- Active flexural angle
- Japanese Orthopedic Association score （JOA score）
- Shape of rotator cuff tear (RCT)
- Stump classification (Ishitani classification)
- Upward of humeral head
- Femoralization of humeral head
- Muscle atrophy
- Fatty infiltration of rotator cuff

⇒ global fatty degeneration index (GFDI)

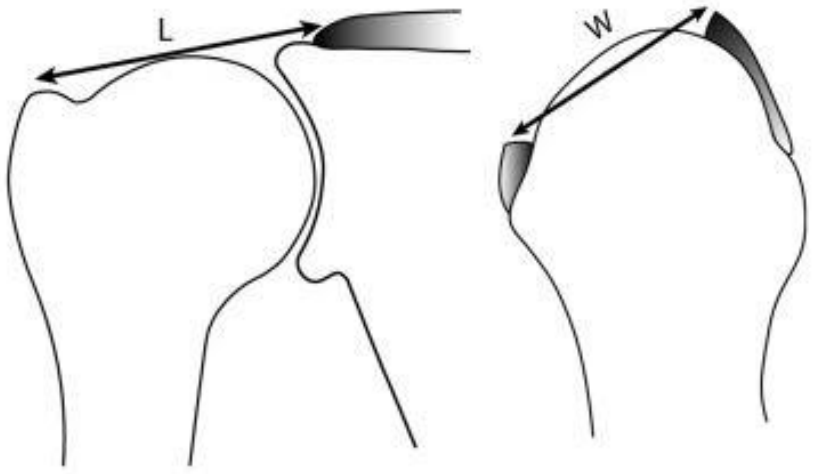
Shape of RCT

① Inside and outside diameter (L)

② Antero - posterior diameter (W)

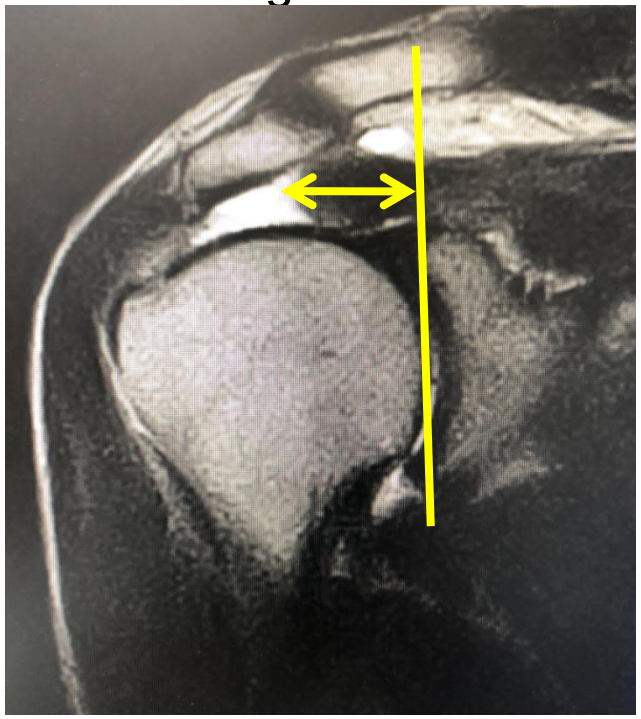
Both the maximum length (L) measured on coronal MRI scans and the maximum width (W) measured on sagittal MRI scans

③ Area of RCT = L × W

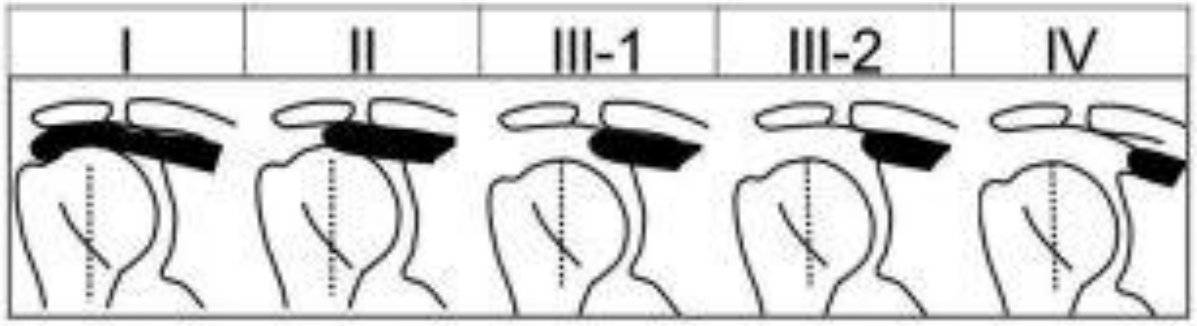


Davidson J , et al. Arthroscopy. 2010

④Distance from glenoid fossa to a stump



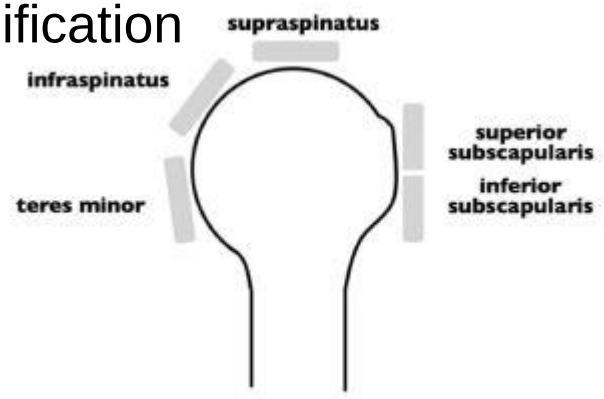
⑤Retreat degree of the tear tendon （Morihara classification）

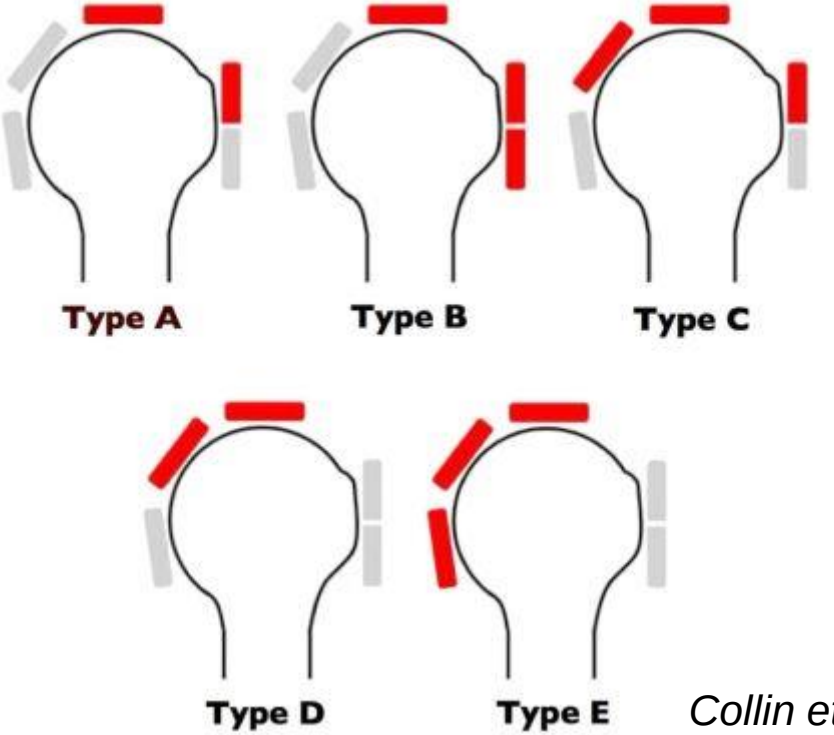


Morihara et al . The Shoulder 2019

Shape of RCT

⑥ Collin classification

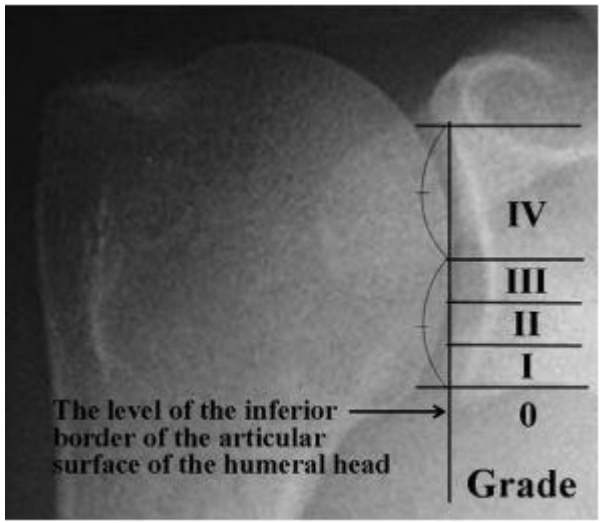




Collin et al. JSES 2014

Upward of humeral head

⑦ Oizumi classification

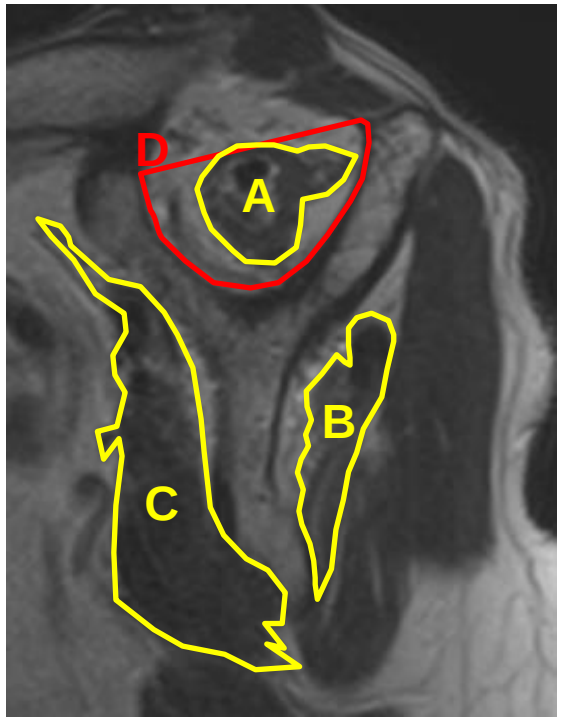


Oizumi et al . JSES, 2007

⑧ Acromiohumeral interval (AHI)

Muscle atrophy

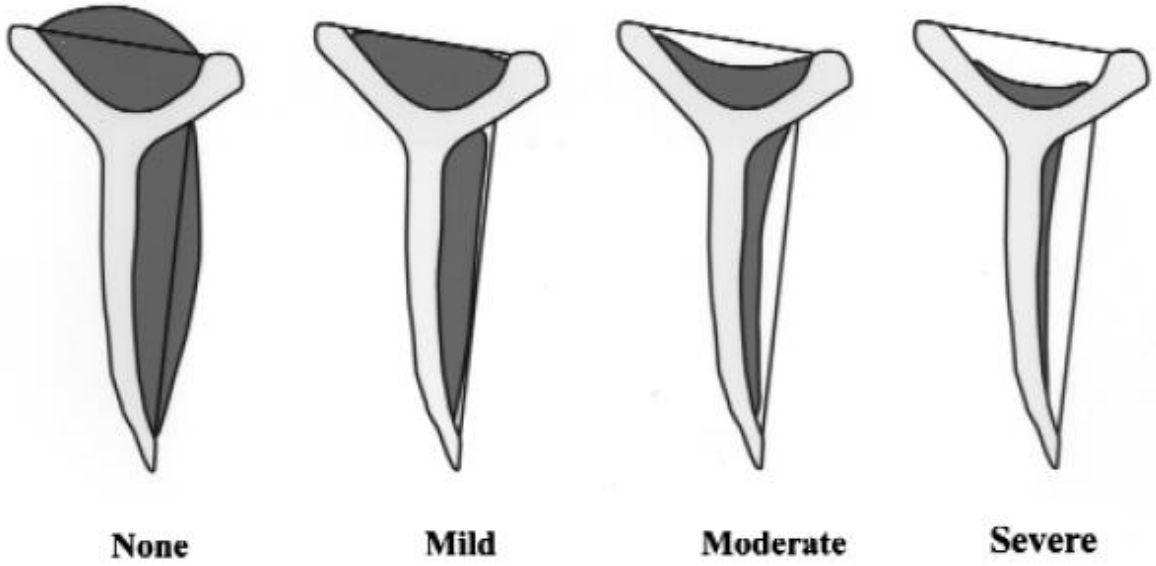
⑨ Percentage of cross-sectional area(PCSA)



PCSA(%)= A +B+C/ D×100

A : cross section of SSP
B : cross section of ISP
C : cross section of SSC
D : cross section of Supraspinatus fossa

⑩ Warner classification



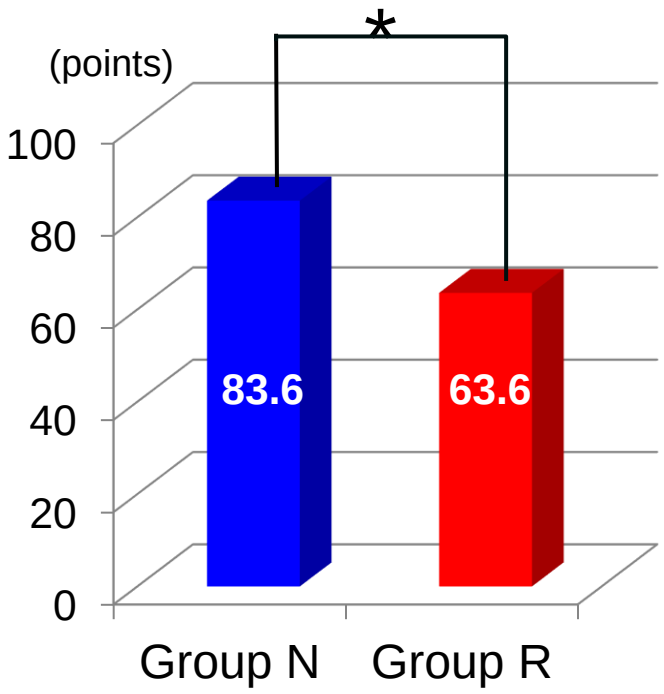
Warner et al. JSES 2001

Statistical analyses

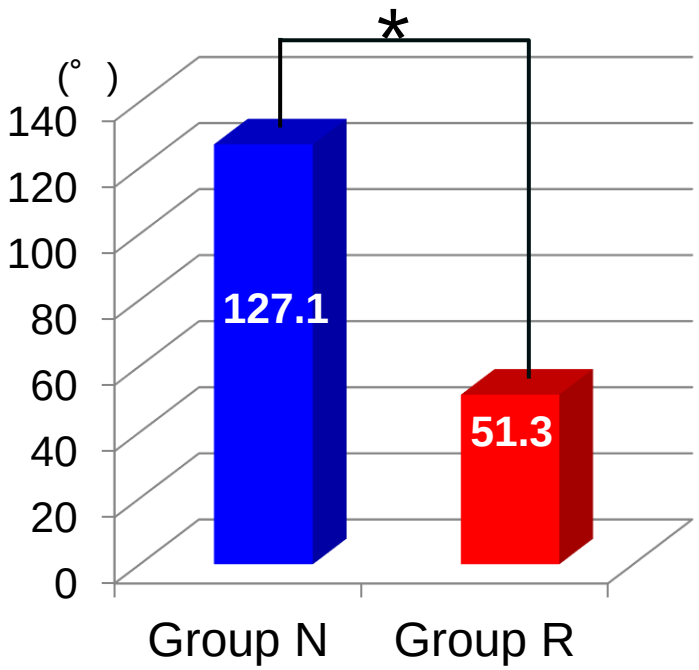
- Mann-Whitney U test
- The hazard ratio was less than 5%

Results

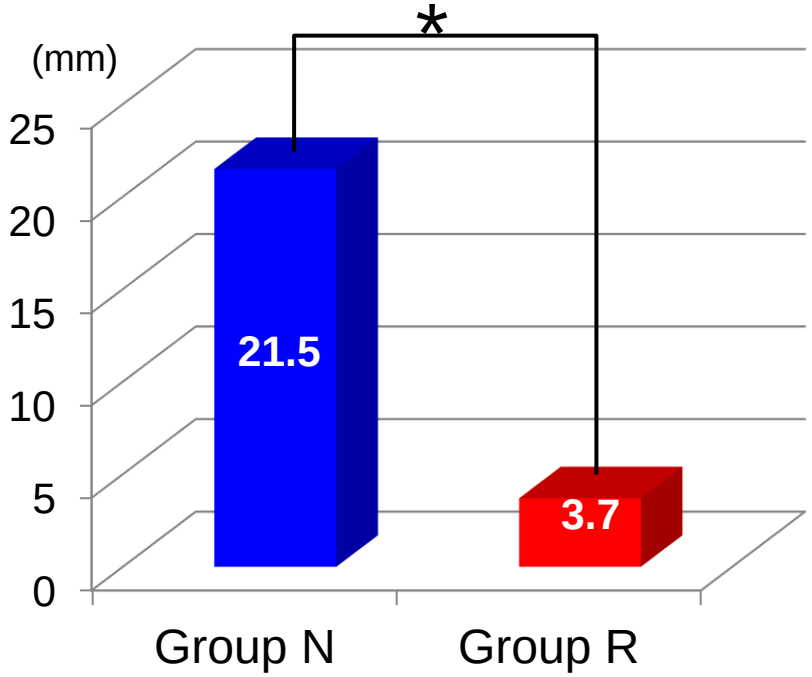
JOA score



Active flexural angle



Difference of the anteroposterior diameter before ARCR and final followup



＊ : P＜0.05

Discussion

Factors affecting clinical results of re-tear cases

- Patients with posteriorly directed intramuscular tendon of supraspinatus muscle have inferior clinical outcomes compared to those without re-tear

  Ohishi 2019

- Exellent clinical outcome in rotator cuff tear patients may be due to the presence of residual LHB

  Matuo et al, 2014

- Reports on the size of the re-tear rotator cuff are also recognized, similar to our present report.

- Shoulders with large repair defects (type V) demonstrate significantly inferior functional outcomes. *Sugaya et al. 2007*
- In all cases requiring reoperation after ARCR, the tear size was larger at the time of re-tear than at the first time. *Ishitani et al 2007*

- Tendon preservation at the middle facet was a predictor of good clinical outcomes in patients who underwent arthroscopic rotator cuff repair of large or massive tears and had postoperative structural failure.

Nakamura et al. 2015

- Anterior-posterior diameter size, JOA score, pain, and range of motion of external rotation are associated with satisfaction in re-tear patients

Harada et al, 2019

+

This study

Conclusion

- The factors that influence the clinical outcomes of re-tear cases after ARCR were investigated.
- Clinical findings showed significant differences in JOA score and active flexion angle.
- In image evaluation a significant difference was observed only in the difference in anterior-posterior diameter between preoperative and final observation.
- It was suggested that repair methods that does not expand the anterior-posterior diameter even if re-tear occurs after ARCR is important.

【References】

1) Goutallier D, et al.: Influence of cuff muscle fatty degeneration on anatomic and functional outcomes after simple suture of full thickness tears. J Shoulder Elbow Surg, 2003; 12: 550-554

2) Kakoi et al. :Clinical outcomes of arthroscopic rotator cuff repair: a retrospective comparison of double-layer, double-row and suture bridge methods. BMC Musculoskeletal Disorders (2018) 19:324

3) Karasuyama M, et al.:Clinical outcomes in patients with retear after arthroscopic rotator cuff repair: A meta-analysis.J Orthop Sci, 2022 ; 27 : 1017-1024

4) Kim H, et al. : Retear bigger than preoperative tear size would lead to treatment failure after rotator cuff repair. . J Shoulder Elbow Surg, 2022; 31: 310-317

5) Nakamura H, et al. : Factors Affecting Clinical Outcome in PatientsWith Structural Failure After Arthroscopic RotatorCuff Repair. Arthroscopy, 2016 ; 32 : 732-73

6) Sugaya H, et al. :Repair integrity and functional outcome after arthroscopic double-row rotator cuff repair. A prospective outcome study. J Bone Joint Surg Am, 2007; 89: 953-960.

7) Tanaka S, et al.：Functional and Structural outcomes after retears of arthroscopically repaired large and massive rotator cuff tears. Orthop J Sports Med, 2021；10：1-7