Comparison of clinical outcome between arthroscopic rotator cuff repair with and without superior capsular reconstruction for reinforcement

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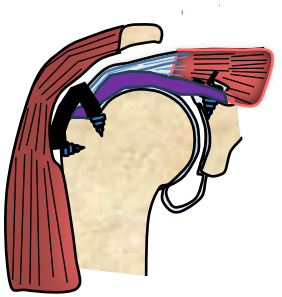
COI Disclosure Information

Presenter : Katsutoshi Miyatake

I have no financial relationships to disclose.

〔Back ground〕

To prevent retear after arthroscopic rotator cuff repair(ARCR), We have been adopting ARCR with superior capsular reconstruction for reinforcement (SCRR) established by Mihata et al[1)].



Simple comparisons of clinical results and repair integrity between ARCR and SCRR methods may be biased due to differences in tear size, which can affect clinical outcomes.

Purpose

To compare clinical outcomes between matched ARCR group and SCRR group for patient with medium tear using propensity score matching .

［Subjects］

127 patients with medium tear were selected in this study from July 2015 to May 2022.

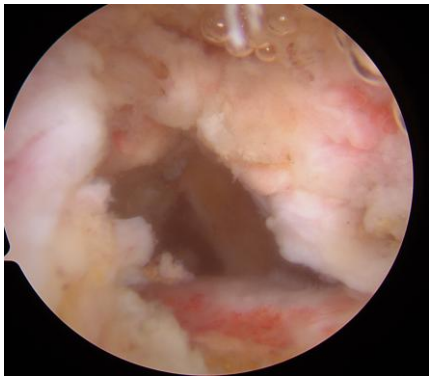
		ARCR group 115shoulders/112cases	Matched ARCR group 13shoulders/13cases
Sex		73 males 39 females	11 males 2 females
Age		69.3y.o.	63.4y.o.
Follow up time		17.3 months	15.5 months
Tear size	ML	18.3mm	20.7mm
	AP	16.0mm	19.3mm

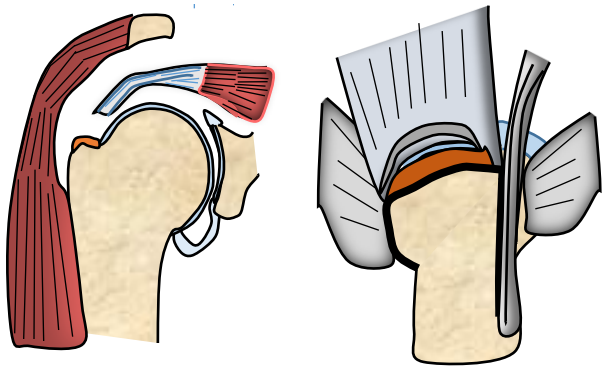
		SCRR group 15shoulders/15cases	Matched SCRR group 13shoulders/13cases
Sex		11males 4 females	9males 4 females
Age		67.7y.o.	68.3y.o.
Follow up time		14.5 months	14.5 months
Tear size	ML	22.8mm	22.8mm
	AP	21.1mm	22.1mm

 # propensity score matching using sex, age, and tear size.

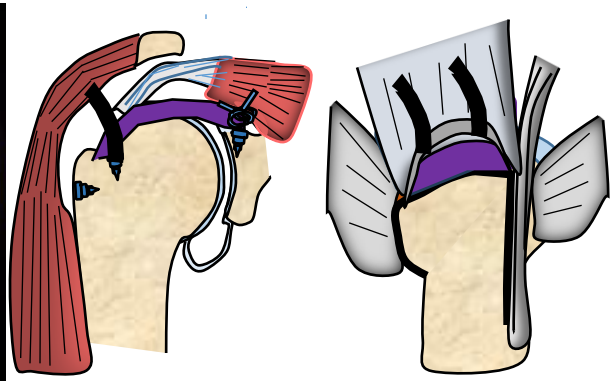
Surgical technique

i) Before graft insertion

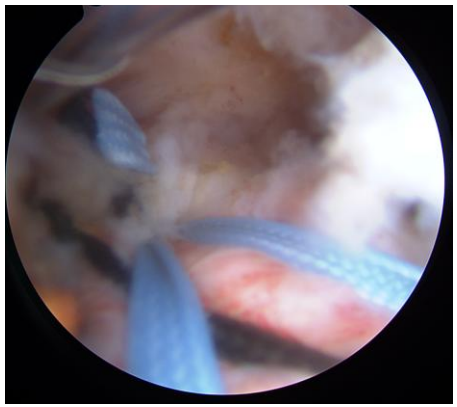


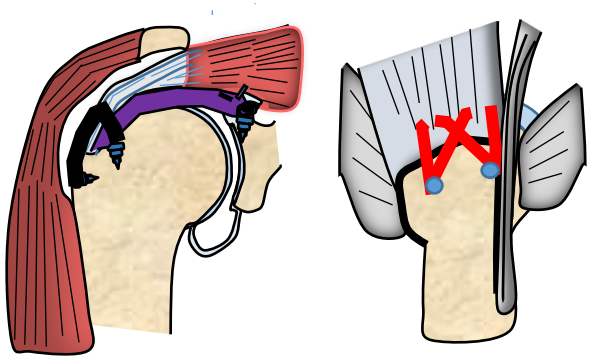


ii) Graft was inserted under native cuff to suture for attachment to superior glenoid



iii) Graft was covered by native cuff(usual suture bridge technique) .





Evaluation

i) Comparison between pre and post op outcomes

- ASES score, Constant score
- ROM（flex、Ab、ExR、InR）

Wilcoxon signed-rank sum test

i) Comparison between ARCR and SCRR group

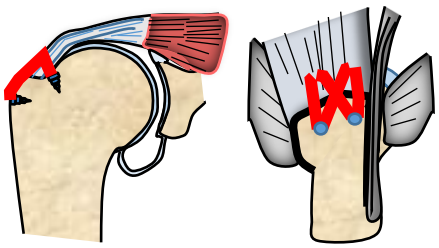
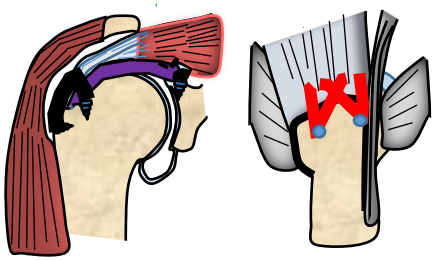
- ASES score, Constant score
- ROM（flex、Ab、ExR、InR）

Mann-Whitney U test

- Repair integrity ; Sugaya's classification[2)]
- Retear pattern; Cho's classfication[3)]

〔Results〕

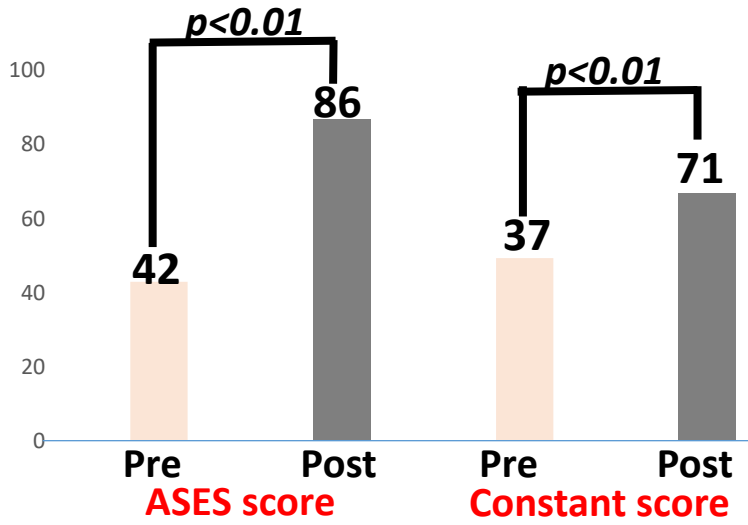
Demographic Data

		Matched ARCR group 13shoulders/13cases	Matched SCRR group 13shoulders/13cases	p value
				
Sex		11 males 2 females	9 males 4 females	n.s.
Age		64.5y.o.	68.3 y.o.	n.s.
Follow up time		15.5 months	14.5months	n.s.
Tear size	ML	20.8mm	22.8mm	n.s.
	AP	19.3mm	22.1mm	n.s.

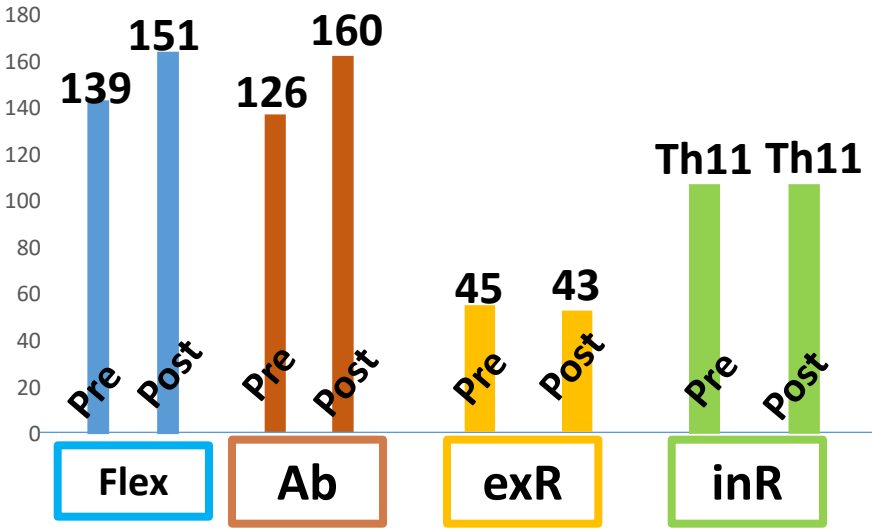
Comparison of scores and ROMs between pre and post-op

ARCR group

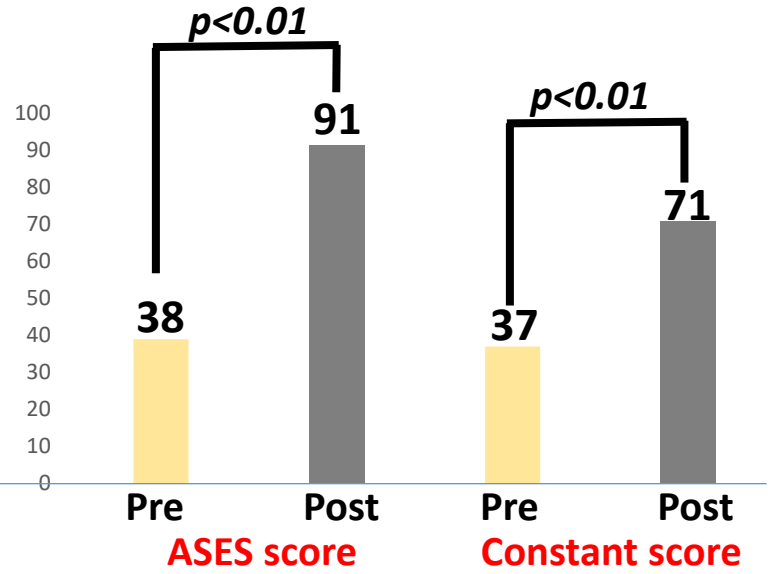
i)Clinical score

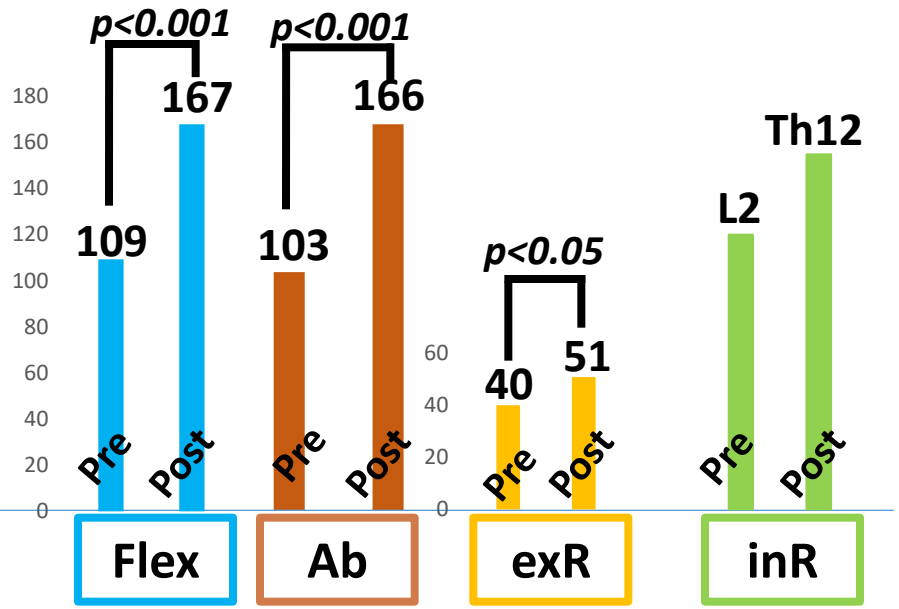


ii) ROM



SCRR group





ARCR group vs SCRR group

Pre-operative

	ARCR	SCRR	p value
ASES score	42.9	38.9	n.s.
Constant score	49.3	37.0	n.s.
Pre flexion	139°	151 °	n.s.
Pre Abduction	135 °	103 °	n.s.
Pre 1st exR	45.8 °	40.0 °	n.s.
Pre 1st inR	6.7 pts	4.8 pts	n.s.

Post-operative

	ARCR	SCRR	p value
ASES score	86.8	91.2	n.s.
Constant score	66.8	70.8	n.s.
Pre flexion	152°	168 °	n.s.
Pre Abduction	151 °	166 °	n.s.
Pre 1st exR	43.8 °	50.8 °	n.s.
Pre 1st inR	6.7 pts	4.8 pts	n.s.

ARCR group vs SCRR group

Cuff repair integrity

Sugaya's classification	ARCR group	SCRR group
Type1	7	6
Type2	1	5
Type3	3	1
Type4	2	0
Type5	0	1
Retear rate	15.4%	7.7%

Graft tear case
71y.o. male

Sugaya type3

ChoType2 retear
In both cases

Retear case
69y.o. male

Sugaya type5
ChoType1 retear

［Discussion］

Previous reports of rotator cuff repair with SCR for reinforcement

- **Fascia lata graft**[1] *Mihata et al. AJSM 2019*
  - i) No difference of clinical score and ROM between 2 methods
  - ii) Retear rate: 4% in ARCR, 0% in SCRR
- **Acellular dermal allograft**[4] *Cutbush et al. JSES 2024*
  - i) Only graft tear :18%, Only RC tear :10%
  - ii) No cases were observed in which both RC and graft were ruptured.
- **Long head of biceps autograft**[5] *Chiang et al Arthroscopy 2021*
  - i) Active ROM improved in cases with LHB graft.
  - ii) Retear rate: 16.7% in LHB graft group, 40.9% in tenotomy group
- **Our study**
  - Retear rate: 15.4% in ARCR, 7.7% in SCRR

Deep reconstruction as reinforcement appeared to contribute to the reduction of retear.

- In cases of retear following ARCR using the suture bridge technique, a **Cho type 2 retear pattern** was frequently observed[3]. *Cho, AJSM 2010*

Medium tear Type1:22.2%, Type2:77.8%
Large tear Type1:12.5%, Type2:87.5%

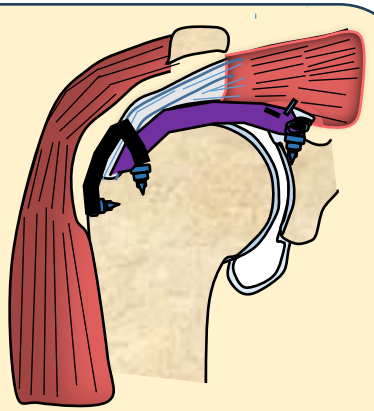
- Our study

Retear pattern; Cho type2 in all 2cases, Cho type1 in a case

Reason

- **Medial knot tying**
- **Tendon quality**
- **Tendon thickness**

Rotator cuff reinforced by deep layer reconstructed with SCRR graft was considered to have sufficient strength to withstand stress applied to medial footprint.



Conclusion

Although no significant differences were observed between the SCRR and ARCR groups in terms of clinical outcomes, the retear rate in the SCRR group appeared to be lower than that in the ARCR group.

This suggests that SCRR may be a more effective method for achieving successful rotator cuff surgery.

Reference

1 Mihata T, et al.: *Am J Sports Med,* 2012; 47(2): 379-388.

2 Sugaya Y, et al.: *J Bone and Joint Surg*[Am], 2007; 89-A: 953-60

3 Cho NS, et al.: *Am J Sports Med,* 2010; 38: 664-671.

4 Cutbush K, et al.: *J Shoulder Elbow Surg* 2024;24: S1058-2746

5 Chiang CH, et al.: *Arthroscopy* 2021;37: 2420-2431