

Primary cuff repair augmented with balloon spacer in a large and massive rotator cuff tear series - a short term outcome and imaging study

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Disclosures/COI

- Nil

Background

- Massive rotator cuff tears remain a challenge for shoulder surgeons who grapple with finding a good surgical alternative to the conventional reverse shoulder arthroplasty ¹
- When repaired, these tears have high chance of failure and poor outcomes ²
- Repair of massive rotator cuff tear have been associated with high rates of recurrent defects and these are primarily related to factors such as the patient's age, size of defect and the presence of fatty degeneration of cuff muscles ³
- Subacromial balloon spacer as an alternative to tackling massive rotator cuff tears has shown favourable outcomes ^{4&5}
- The technique was first introduced as a less invasive and bridging option to massive rotator cuff tears that typically require reverse shoulder arthroplasty ⁶
- The balloon is said to degrade within 12 months but it is unclear how long the balloon remains inflated ⁶

Materials and Methods

- Retrospective review of 34 consecutive cases between 2019-2021
- Large and massive cuff tears included in the series (DeOrio and Cofield's classification)
- Prospectively collected pre-operative and post-operative outcomes scores (UCLA, Constant, Oxford)
- Statistical analysis: SPSS version 21, Paired t-test for pre-op and post-op significance, p value < 0.05
- Surgical technique: Dual row suture bridge technique augmented with subacromial balloon space (OrthoSpace, Kfar Saba, Israel)
- All patients had pre-operative MRI done (n=34)
- Post-operatively followed up at 2,4,6 weeks initially, subsequently 3 and 6 months
- CIRB Ref: 2019/2777

Results (Demographics of patients)

Demographic	Number (N=34)	(%)
Gender		
Male	18	53
Female	16	47
Age group:		
40-49	2	6
50-59	3	9
60-69	14	41
70-79	12	35
80 and above	3	9
Average age	64.3	
BMI group:		
Underweight (<18.5)	0	0
Normal (18.5 – 22.9)	10	29
Overweight (23 – 24.9)	8	24
Obese (>25)	16	47
Average BMI	26.1	
Side involved		
Right	23	68
Left	11	32

Results (Characteristics of tear and balloon size used)

Character	N= 34	(%)
Tear Size		
Small	0	0
Medium	0	0
Large	10	29
Massive	24	71
Goutallier grading (n=34)		
Grade 0	0	0
Grade 1	5	15
Grade 2	8	24
Grade 3	14	41
Grade 4	7	20
Average	2.7	
Balloon Size		
small (40 mm ×50 mm)	23	68
medium (50 mm ×60 mm)	11	32
large (60 mm ×70 mm)	0	0

Results (Outcome scores)

Scores	Average (range)	P value
Constant Score (best at 100)		
Pre-operative	40.9 (5-46)	
3 months	39.5 (21-68)	0.785
6 months	53.6 (22-85)	0.055
UCLA score (best at 35)		
Pre-operative	14.9 (3-23)	
3 months	23.4 (13-34)	<0.001
6 months	27.5 (16- 35)	<0.001
Oxford Score (best at 12)		
Pre-operative	35.0 (15-58)	
3 months	27.8 (12-56)	0.064
6 months	21.9 (12-42)	0.044
VAS Score		
Pre-operative	7.3 (6-10)	
Post-operative	3.7 (0-5)	<0.001

- Post-operatively 8 patient underwent ultrasound of the operated shoulder for symptoms of persistent pain at 6 weeks mark/clinical suspicion of ?re-tear
- Four ultrasound images shown intact balloon spacer within the subacromial space, nil re-tears
- Four ultrasound images did not show any discrete balloon, suggestive of balloon rupture/deflation (one had evidence of cuff re-tear as seen with a supraspinatus tendon gap)

Post-operative Imaging (E.g of intact balloons)



Intact balloon at expected location, a clearly demarcated and inflated balloon measuring 4.4 by 2.2cm is seen here at 6 weeks post-operatively. Cuff repair is intact with no visible tendon gap



Post-operative Imaging (E.g of absent balloons)



No balloon seen at the expected locations or elsewhere within the shoulder joint at 6 weeks post-operatively. Evidence of a small re-tear with visible tendon gap in 1 case as shown (white arrow)

- Rotator cuff repair in large and massive cuff tears augmented with balloon spacer gives favourable outcomes
- Favourable outcomes persist after presumed balloon disintegration (1 year) - ? effects of fibrotic granulation tissue formation
- Balloon disintegration may occur as early as 6 weeks mark – Limits the use of balloon spacer as a standalone treatment
- First post-operative imaging study depicting early balloon disintegration to the authors' knowledge

Limitations of study:

Retrospective case series

Both large and massive cuff tears combined

References

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