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Effects of an Abduction Brace After Shoulder Surgery on Gait Parameters and Functional Mobility

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FDA Status

Not Applicable



PURPOSE

- Still unclear whether the use of a shoulder abduction brace (SAB) after surgery might affect patients' functional outcomes, and whether these changes persist after rehabilitation
- This study aimed to analyse gait and functional mobility in patients undergoing shoulder arthroplasty and rotator cuff repair and wearing a 15° SAB





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METHODS

- 35 Participants  64%  36%
- Age (years) 53.5 ± 10.4
- BMI (kg/m²) 25.9 ± 4.7



TEST PROTOCOLS

- 10-Meter Walk test

(10MWT)

- Timed Up and Go test

(TUG)



Gait parameters and functional mobility evaluations were carried out using a wearable inertial device for gait analysis (G-Walk System by BTS Bioengineering)

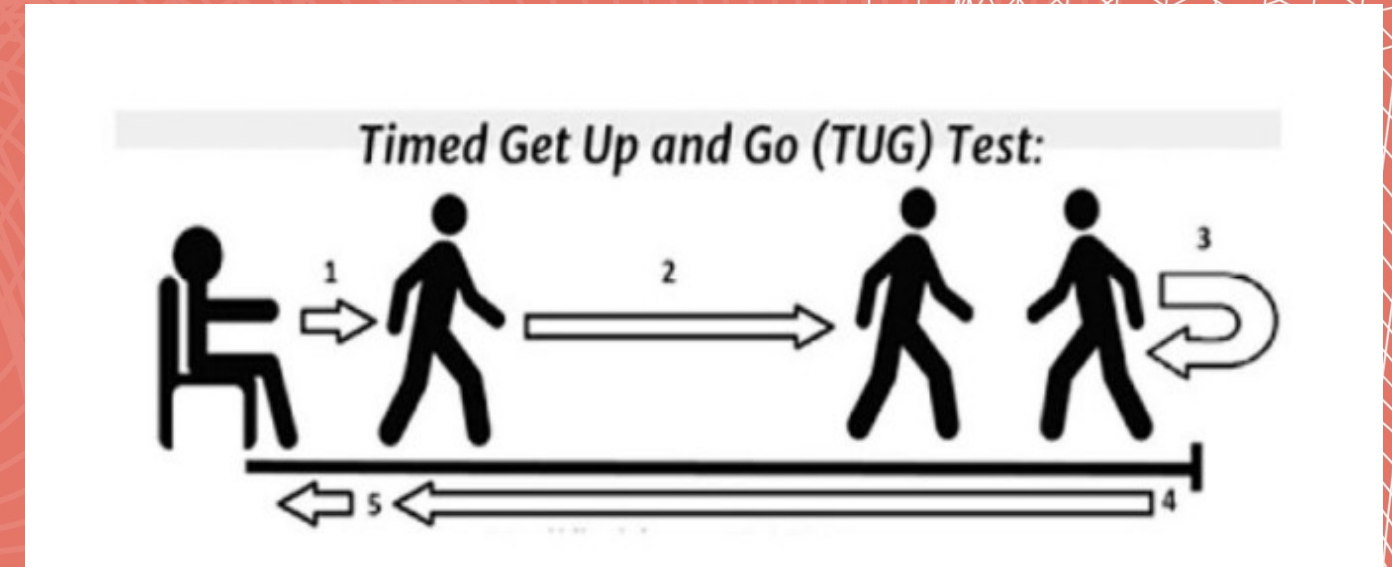


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EXPERIMENTAL PROCEDURE



T_0

T_1

T_2

T_3

Pre-surgery

24 h post-surgery

7 days post-surgery

After SAB
removal



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RESULTS

10MWT and TUG parameters. Data are presented as Mean \pm Standard Deviation

| 10MWT | T ₀ | T ₁ | T ₂ | T ₃ |
|---------------------------------|------------------|----------------------------|-----------------|--|
| Duration (s) | 8.6 \pm 1.3 | 9.2 \pm 1.4 [*] | 8.9 \pm 1.2 | 8.5 \pm 1.1 ^{**} |
| Speed (m/s) | 1.2 \pm 0.2 | 1.1 \pm 0.2 [*] | 1.1 \pm 0.1 | 1.2 \pm 0.1 ^{α} |
| Cadence (steps/min) | 116.2 \pm 10.8 | 110.5 \pm 13.2 | 116.1 \pm 9.4 | 117.3 \pm 8.0 ^{α} |
| R-Step length (% stride length) | 49.8 \pm 2.5 | 50.6 \pm 1.9 | 50.4 \pm 2.1 | 50.2 \pm 1.7 |
| L-Step length (% stride length) | 48.9 \pm 8.0 | 49.4 \pm 1.9 | 49.6 \pm 2.0 | 49.8 \pm 1.7 |
| TUG | | | | |
| Duration (s) | 8.8 \pm 1.7 | 8.8 \pm 1.3 | 9.1 \pm 1.3 | 8.5 \pm 1.4 |
| Sit to stand (s) | 1.2 \pm 0.3 | 1.2 \pm 0.3 | 1.4 \pm 1.5 | 1.2 \pm 0.3 |
| Mid turning (s) | 1.5 \pm 0.4 | 1.6 \pm 0.3 | 1.6 \pm 0.4 | 1.5 \pm 0.4 |
| Final turning (s) | 1.4 \pm 0.4 | 1.4 \pm 0.3 | 1.5 \pm 0.3 | 1.3 \pm 0.3 ^{β} |
| Stand to sit (s) | 1.5 \pm 0.7 | 1.4 \pm 0.4 | 1.7 \pm 1.6 | 1.4 \pm 0.8 |

^{*}p<0.01 vs T₀; ^{**}p<0.01 vs T₁; ^{α} p<0.05vs T₁; ^{β} p<0.01 vs T₂; R, right; L, left



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CONCLUSIONS

- The use of SAB negatively influenced walking speed and cadence during the 10MWT and the final turning phase before sitting during the TUG test. However, after SAB removal these variables returned to basal values (i.e., before surgery)
- We may hypothesise that patients wearing a SAB pay more attention when walking and before sitting due to the fear of falling
- Exercise specialists, together with physiotherapists, should take into consideration these effects in order to define the optimal rehabilitation protocol



REFERENCES

- Sonoda Y, Nishioka T, Nakajima R, Imai S, Vigers P, Kawasaki T. Use of a shoulder abduction brace after arthroscopic rotator cuff repair: A study on gait performance and falls. Prosthet Orthot Int. 2018;42:136-143.
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