

Safety and Cost-Effectiveness of Inter-Scalene Brachial Plexus Block with Sedation in Reverse Total Shoulder Replacement

Kiran Ramesh, Muhammad Yusuf, Navnit Makaram, Ross Milton, Aji Mathew, Makaram Srinivasan

Upper Limb Service – East Lancashire Hospitals NHS Trust



INTRODUCTION & OBJECTIVES

INTRODUCTION

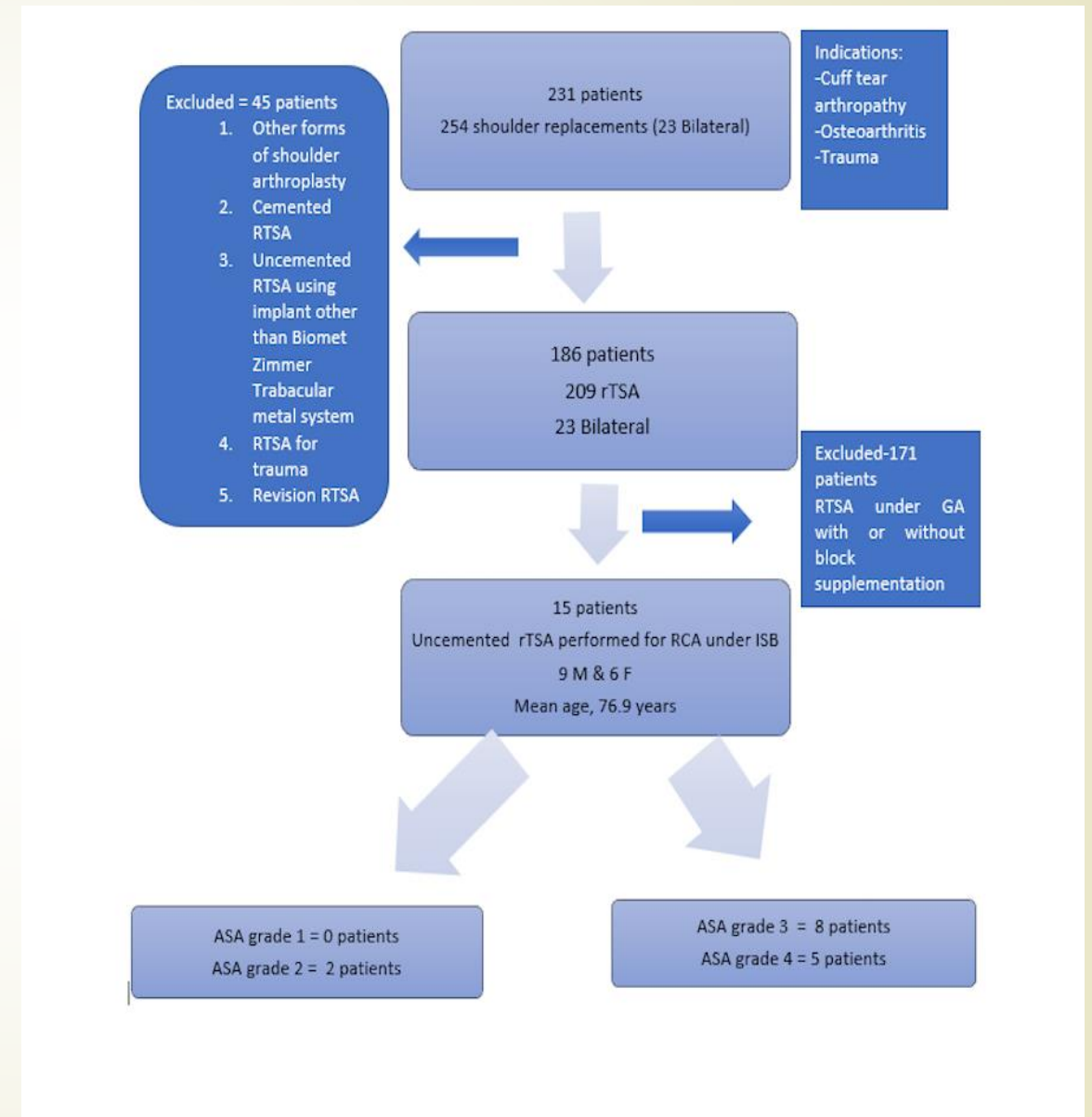
- Interscalene brachial plexus block/regional anaesthesia (ISB-RA) has revolutionised same-day upper limb surgery procedures, as an alternative to, or sometimes in combination with, general anaesthesia (GA).
- They are safe, with excellent patient acceptance and shorter hospital stays, compared with GA, in arthroscopic shoulder procedures.
- While the literature is replete with articles on the use of ISB-RA in shoulder arthroscopy and its effectiveness as a postoperative analgesic, there is scarce information on its use alone, as the sole anaesthetic, in patients undergoing open shoulder procedures, such as shoulder replacement surgery

OBJECTIVES

- ▶ To investigate the safety and cost-effectiveness of interscalene brachial plexus block/regional anaesthesia (ISB-RA) in patients undergoing reverse total shoulder replacement.

PATIENTS AND METHODS

- Retrospective observational study of 15 patients who underwent Uncemented Reverse Total Shoulder Replacement under Inter-scalene Brachial plexus block without general anaesthesia between 2010 – 2018.
- 9 Females and 6 Males with a mean age of 76.9 (59-82)
- Assessed parameters were: duration of anaesthesia, intra-operative systolic blood pressure variation, sedation and vasopressor use, duration of post-operative recovery, recovery scores, length of stay, and complications. A robust cost analysis was also performed



PATIENTS AND METHODS

Table 1: Inclusion and exclusion criteria

rTSA, reverse total shoulder arthroplasty; GA, general anaesthetic; RA, regional anaesthetic; ASA, American Society of Anesthesiologists

| Inclusion criteria | Exclusion criteria |
|--|--|
| rTSA | Other forms of shoulder arthroplasty: hemiarthroplasty, total shoulder replacement, and shoulder resurfacing hemiarthroplasty |
| Uncemented rTSA using the Biomet Zimmer Trabecular Metal system | Cemented rTSA and uncemented rTSA using implant other than the Biomet Zimmer Trabecular Metal system |
| rTSA performed under RA and supplemental sedation | rTSA performed under GA or a combination of general and RA |
| rTSA performed electively for symptomatic rotator cuff tear arthropathy | rTSA performed for trauma (unreconstructable proximal humerus fractures), primary or secondary malignancy, or for revision of failed shoulder arthroplasty |
| Patients with significant co-morbidities (ASA 3–4) and patients with ASA 2 who opted for regional block. | ASA 3–4 patients who were fit for GA and ASA 1–2 patients who did not consent to regional block anaesthesia alone |

OBSERVATIONS AND RESULTS

- Mean (range) duration of anaesthesia was 38.66 (20-60) min.
- Maximum and minimum intra-operative systolic blood pressure ranges were 130-210 and 75-145 mmHg, respectively (mean [range] drop, 74.13 [33-125] mmHg).
- Mean (range) propofol dose was 1.74 (1-3.0) mg/kg/h.
- Median (interquartile range) post-operative recovery time was 30 (20-50) min.
- Mean (range) postoperative recovery score (local scale, range 5-28 where lower values are superior) was 5.2 (5-8).
- Mean (range) length of stay was 8 (1-20) days;
- The two included patients with ASA grade 2 were both discharged within 24 hours.
- One patient with predisposing history developed pneumonia; however, there were no complications related to ISB-RA.
- The mean (range) cost per patient was £101.36 (£59.80-£132.20).

| PARAMETERS | PATIENTS | | | | | | | | | | | | | | | Mean/median |
|--------------------------|----------|----|----|-----|----|----|-----|-----|-----|-----|-----|----|-----|-----|-----|-------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | Mean |
| Anaesthesia time (min) | 60 | 50 | 30 | 30 | 40 | 30 | 20 | 25 | 45 | 35 | 40 | 45 | 60 | 40 | 30 | 38.66 |
| Systolic BP Drop (mm Hg) | 80 | 75 | 50 | 90 | 33 | 65 | 100 | 50 | 85 | 105 | 125 | 80 | 70 | 54 | 50 | 74.13 |
| Propofol µg/ml | 2 | 2 | 2 | 1.4 | 2 | 2 | 1.7 | 1.3 | 1.6 | 3 | 1 | 2 | 1.5 | 1.3 | 1.3 | 1.74 |
| Recovery time (Min) | 50 | 75 | 40 | 20 | 80 | 20 | 20 | 45 | 30 | 50 | 240 | 25 | 40 | 25 | 45 | 30 (Median) |
| LOS (Days) | 14 | 5 | 20 | 8 | 6 | 3 | 3 | 2 | 18 | 15 | 17 | 5 | 2 | 1 | 1 | 8 |



CONCLUSIONS

- ▶ Favourable results in our series of high-risk patients undergoing Reverse shoulder replacement under ISB-RA supplemented with sedation , in terms of acceptability, safety, complication rates, and cost-effectiveness.
- ▶ High-quality studies comparing RA versus GA in shoulder arthroplasty required in the future to investigate clinical outcomes and cost-effectiveness in patients of all risk groups undergoing shoulder replacement, as well as the addition of enhanced recovery, to explore the possibility of offering shoulder replacement surgery under RA as a day care procedure.