

Reverse End-to-Side Spinal Accessory to Suprascapular Nerve Transfer for Brachial Plexus Birth Injury

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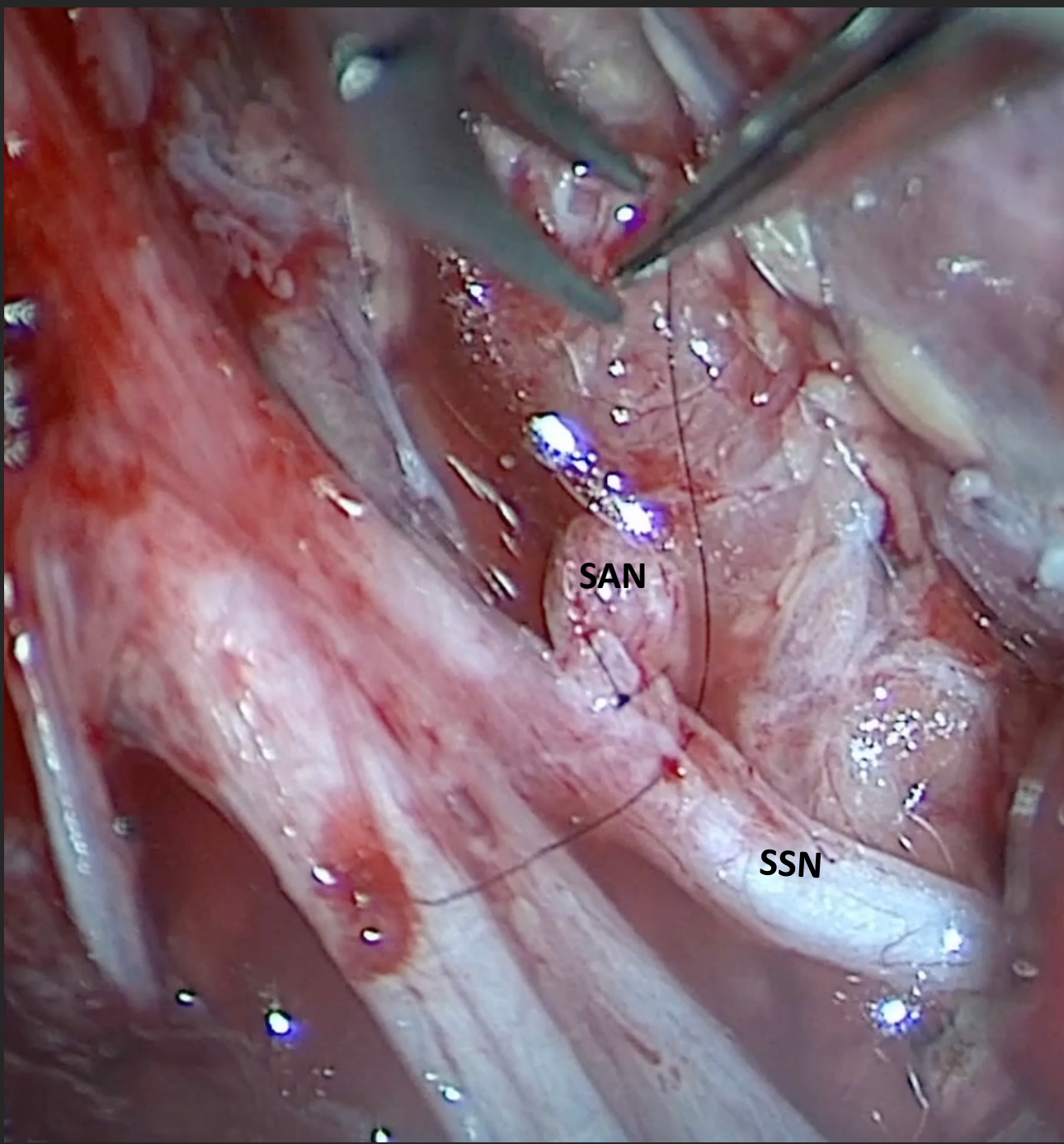
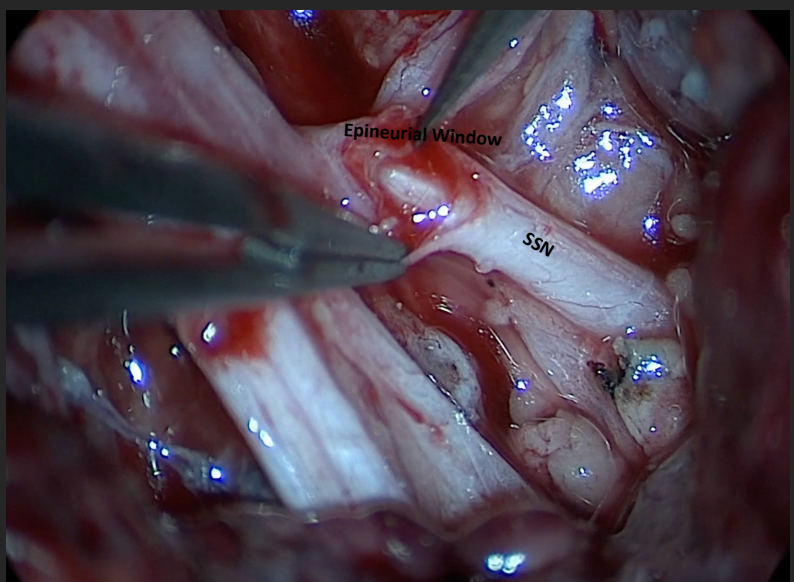
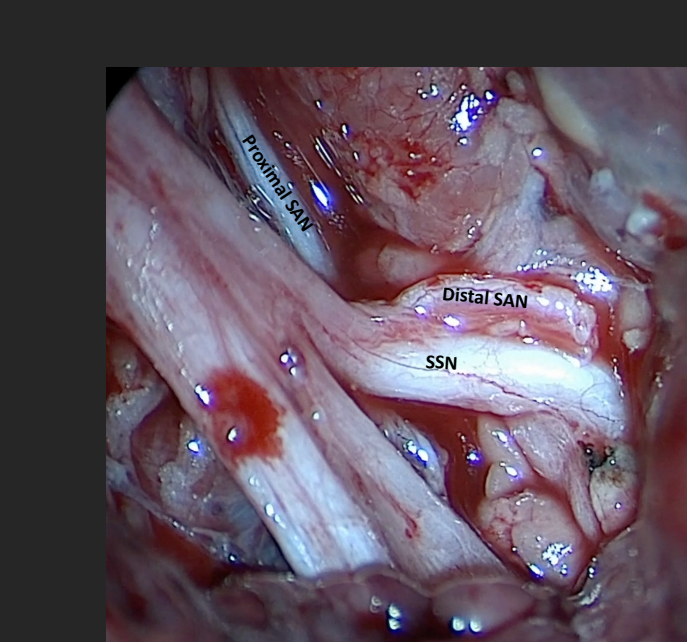
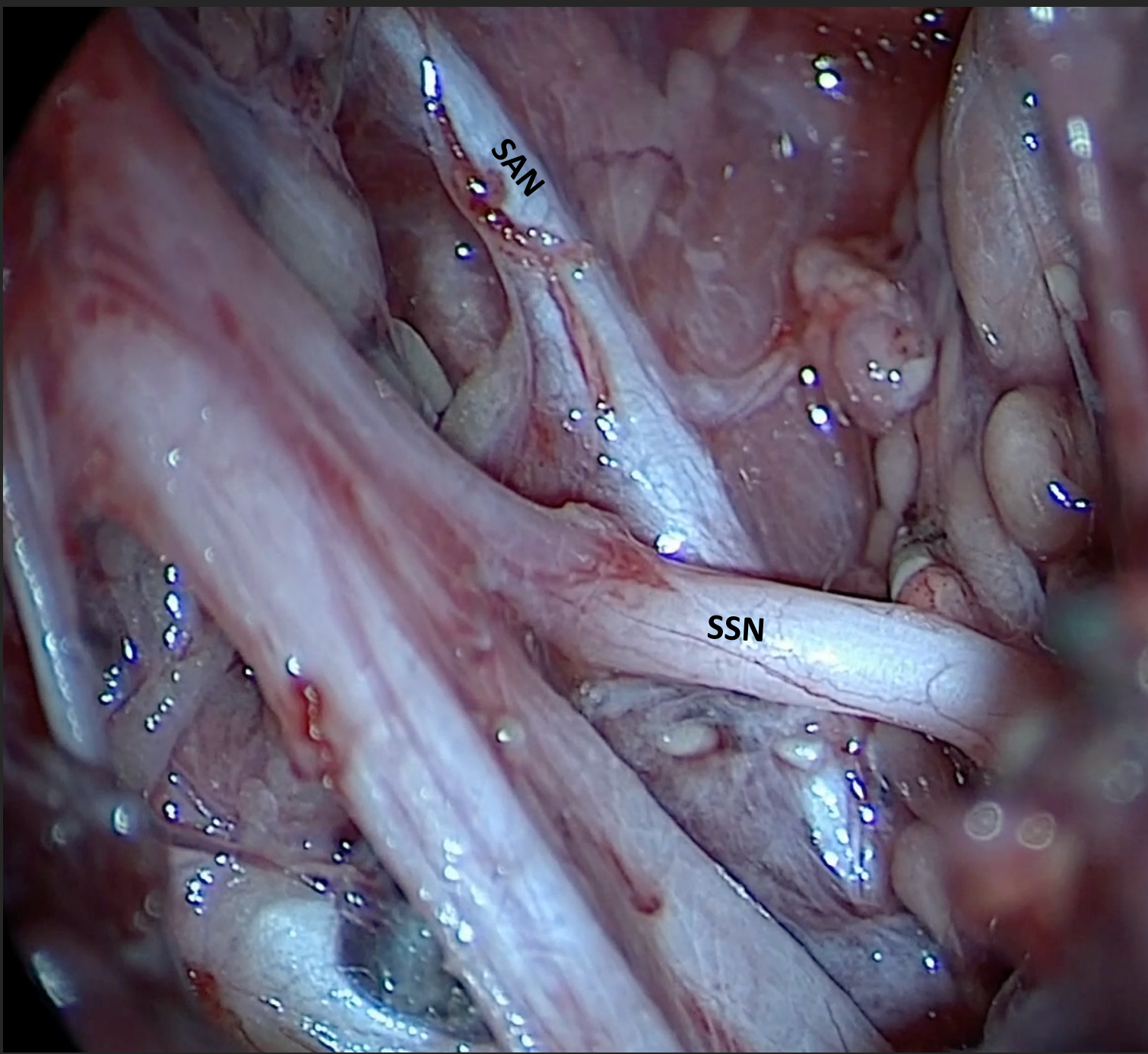
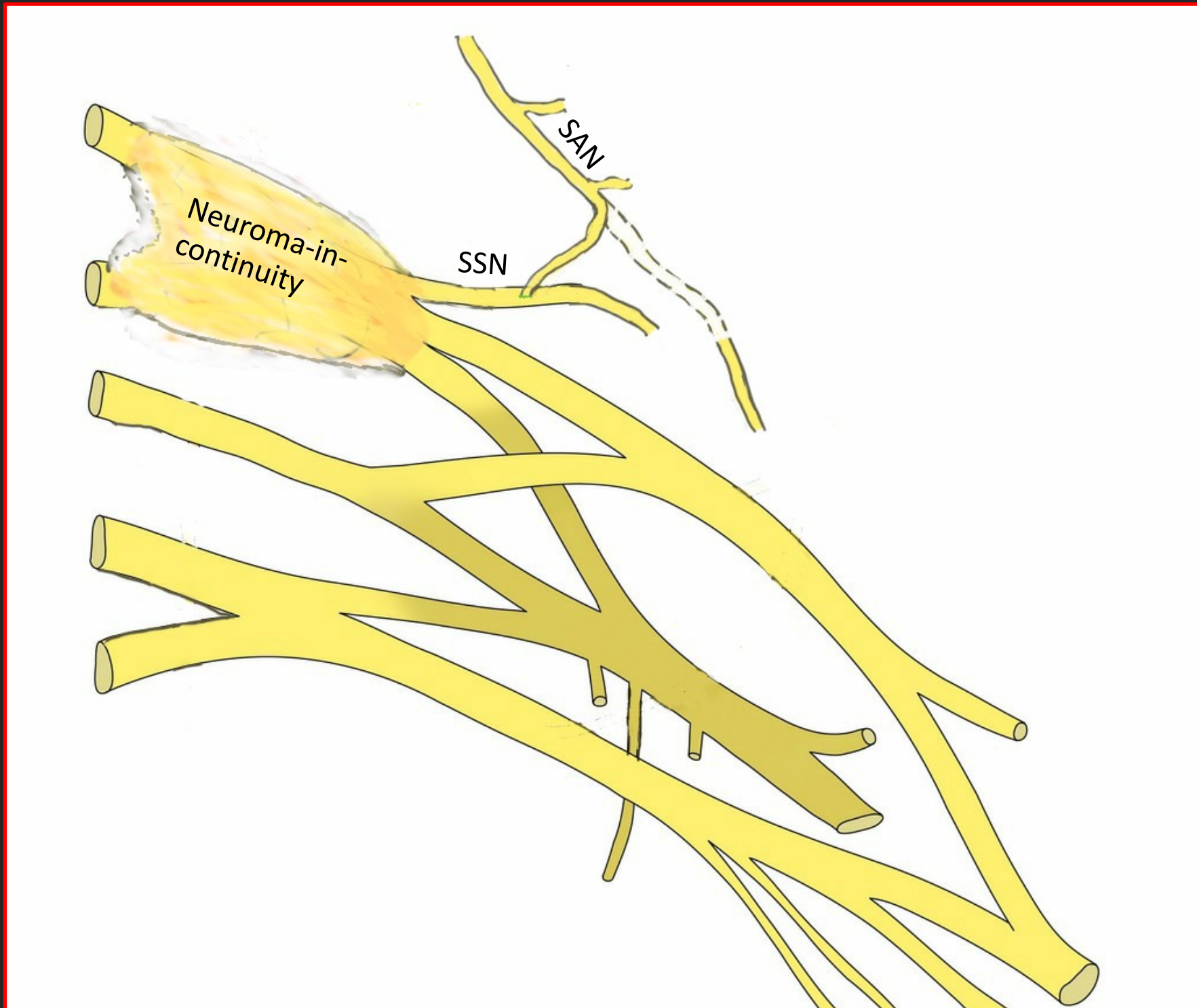
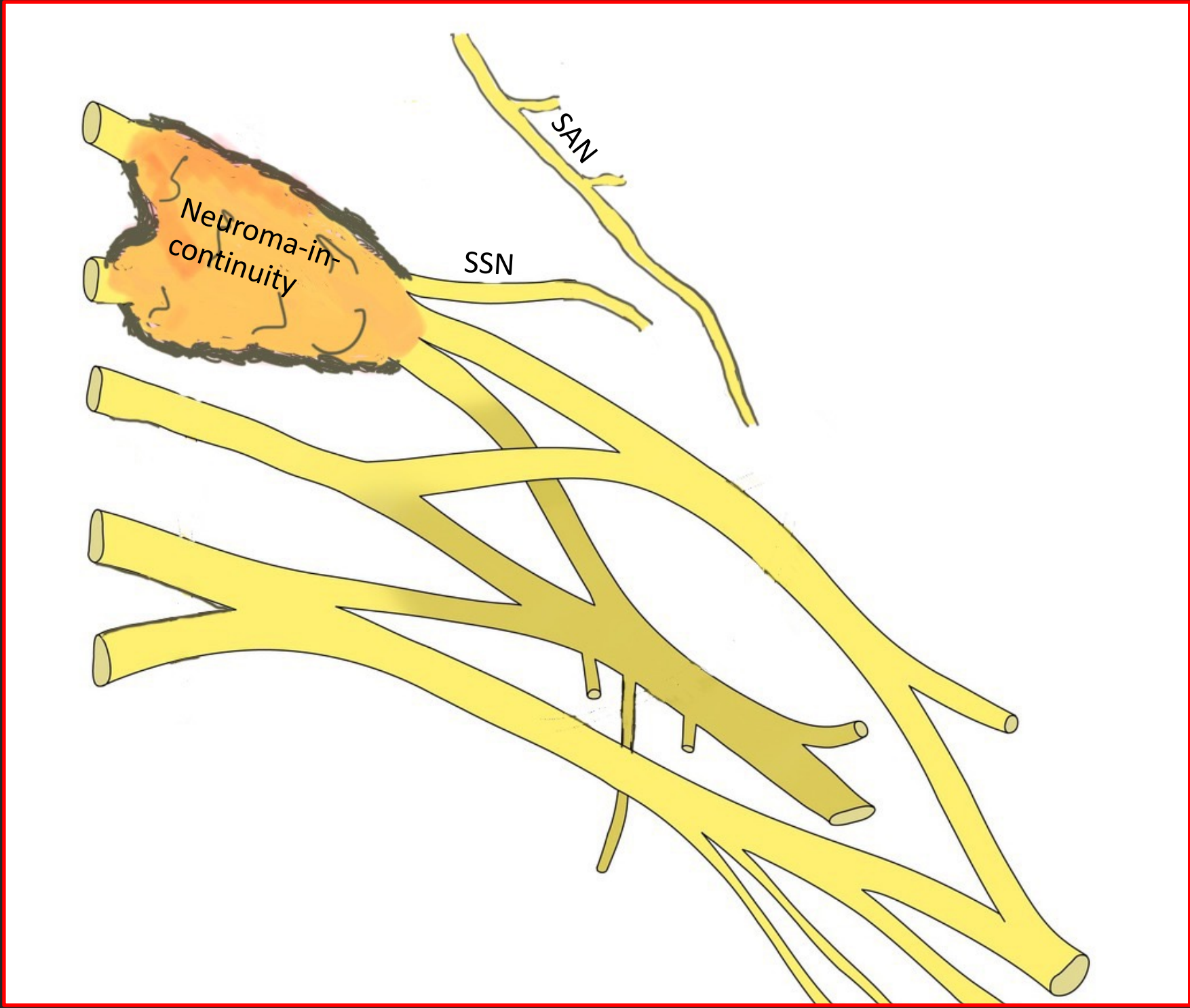
PURPOSE We seek to describe our experience with reverse end-to-side (RETS) transfer of the spinal accessory nerve to the suprascapular nerve in the reconstruction of brachial plexus birth injury (BPBI).

METHODS Retrospective review was performed from 2016-2021 to identify BPBI patients who underwent RETS transfer of SAN to SSN. Concurrent botulinum toxin administration was performed in all cases. Intraoperative images were reviewed, assessing proximity of SAN to SSN, as well as the relative diameter of the two nerves. Early outcomes were reviewed.

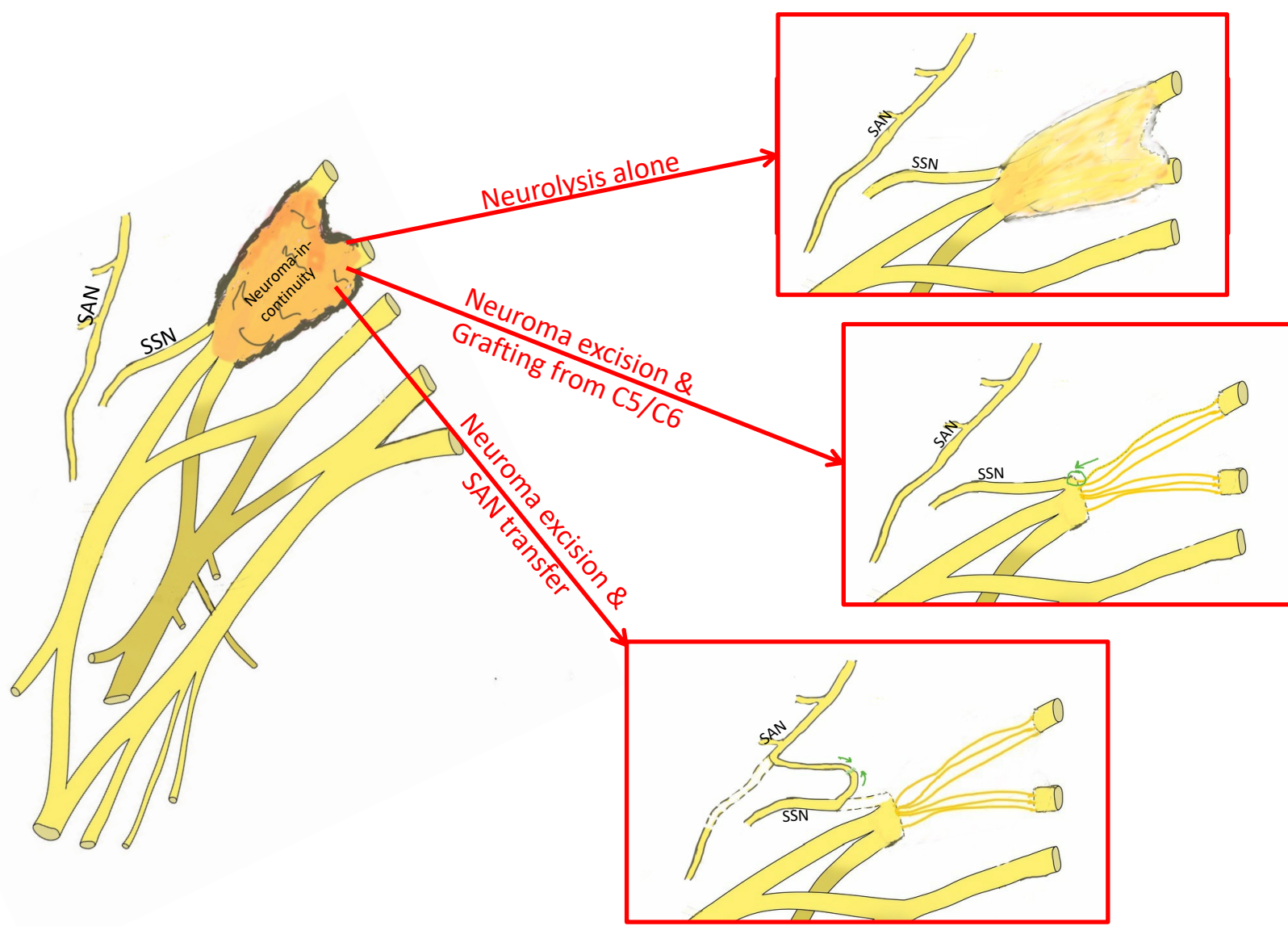
RESULTS

- Seven patients underwent RETS transfer of SAN to SSN.
- Mean age at operation was 10.8 +/- 4 months.
- Intraoperative image review demonstrated close proximity of the distal SAN to the distal SSN in all cases.
- Ratio of SAN-SSN diameter: 0.31 +/- .1
- RETS transfer of the SAN to the SSN was performed without tension in all 7 cases.
- No donor morbidity was noted in any patient.
- Average follow-up after reconstruction is 9.7 +/- 10 months.
- All patients have demonstrated some degree of SSN functional recovery.
- At most recent follow-up, 5 out of 7 patients demonstrate full passive ER; the two remaining are to 80 and 60 degrees.
- Evidence of early recovery of active external rotation has been observed in all patients.
- No patients with significant trapezius wasting/atrophy.
- No patients have required a tendon transfer.

Reverse end-to-side transfer of the spinal accessory nerve to the suprascapular nerve is feasible and demonstrates potential to augment recovery in the setting of incomplete signal to the suprascapular nerve.



Traditional Treatment Options for Neuroma-in-Continuity



Injury Grade and Imaging Findings

| Patient | Age at Surgery | Injury Pattern | MRI C5  | MRI C6 | Shoulder (Birch) |
|---------|----------------|----------------|---------|--------|------------------|
| 1       | 11 mo          | C5-6           | Normal  | P*/AbR | 3                |
| 2       | 16 mo          | C5-6           | Normal  | P*/RA  | 1                |
| 3       | 4 mo           | C5-C8          | Normal  | Normal | 1                |
| 4       | 10 mo          | C5-7           | Normal  | P*/AbR | 3                |
| 5       | 13 mo          | C5-7           | Normal  | P*/AbR | 2                |
| 6       | 14 mo          | C5-6           | Normal  | Normal | 1                |
| 7       | 8 mo           | Global         | Present | P*/RA  | 2                |

P\*:pseudomeningocele  
AbR: abnormal rootlets  
RA: rootlets avulsed

Patient #4: Birch Classification 3

Concomitant Procedures

| Patient | Age at Surgery | Injury Pattern | Concomitant Grafting Procedures (partial neurotomy) |
|---------|----------------|----------------|-----------------------------------------------------|
| 1       | 11 mo          | C5-6           | C5 → ADUT & PDUT                                    |
| 2       | 16 mo          | C5-6           | C5 → PDUT                                           |
| 3       | 4 mo           | C5-C8          | C5 & C6 → ADUT                                      |
| 4       | 10 mo          | C5-7           | C5 → ADUT                                           |
| 5       | 13 mo          | C5-7           | Botox only                                          |
| 6       | 14 mo          | C5-6           | Botox only                                          |
| 7       | 8 mo           | Global         | C5 → M/L/P cords                                    |

Outcomes

