Introduction

- Neonatal brachial plexus injury (NBPI) is commonly caused by traction during delivery.
- Injuries to the brachial plexus involving the C5 and C6 nerve roots or the upper trunk can result in poor or absent shoulder external rotation due to compromise of the suprascapular nerve (SSN).
- Recovery of external rotation after surgery is very important, because glenohumeral deformity and muscle imbalance of rotator cuff will lead to permanent internal rotation contracture.
- The purpose of the current systematic review was to present the clinical results after SAN-SSN transfer comparing nerve graft techniques in NBPI.
- Our hypothesis was that SAN-SSN transfer for NBPI will significantly improve external rotation of the shoulder joint and reduce the necessity of secondary surgery.

Methods & Materials

- A systematic search was conducted in the electronic databases PubMed, Web of science, and SciELO Databases (January 1950 to December 2019).

Inclusion Criteria

- Used SAN-SSN transfer technique compared to nerve graft technique in NBPI involving C5 and C6 nerve.
- Studies that individually reported shoulder function preoperatively and postoperatively.
- A minimum clinical follow-up of 12 months.

Exclusion Criteria

- There was no statistical analysis of preoperative and postoperative clinical outcome.
- No control group, and/or less than 12 months of follow-up postoperatively.

Outcomes

- For evaluating shoulder function, active movement scale (AMS) scores were used to evaluate the shoulder function both preoperatively and postoperatively.
- The necessity for a secondary surgery to improve the functional outcome was compared between nerve transfer and nerve graft.
- The secondary surgery was defined as contracture release of the glenohumeral joint, tendon transfer and humeral osteotomies.

Results

- 3.5.5 AMS score function

Study | Shoulder Function | Mean | SD | Total Mean | Total | Median | Total Median | Stat. Significance | N1 | N2 | Year
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Yoon et al. 2017 | 6.7 | 1.0 | 4 | 5.3 | 6.3 | 12 | 11.9 | * p = 0.014, 2017 | 19 | 18 | 2017
Korea et al. 2017 | 4.4 | 1.0 | 5 | 4.5 | 4.8 | 10 | 8.1 | * p = 0.002, 2017 | 21 | 21 | 2017
Togashi et al. 2017 | 5.3 | 1.0 | 6 | 5.1 | 5.9 | 11 | 7.9 | * p = 0.001, 2017 | 22 | 22 | 2017

Functional outcome of shoulder function

- AMS score for shoulder external rotation of the nerve transfer group was significantly higher than that of the nerve graft group postoperatively.
- There was no significant difference between the two groups in flexion, abduction.

Necessity of secondary surgery

- There was a tendency to be less necessity of secondary surgery in the nerve transfer group as compared to the nerve graft group, but no significant difference.

Conclusions

- SAN-SSN transfer for NBPI showed significantly greater improvement in shoulder external rotation postoperatively compared to nerve graft procedures and is the preferable surgical option for NBPI.
- But due to the paucity of data available for analysis, prospective, well-designed clinical studies are required to provide more clarity on the surgical procedure or combination of surgical procedure to optimize functional outcome.