Value of Soft Tissue Release Procedure around the Shoulder to Improve Shoulder Abduction in Birth Brachial Plexus Palsy and Analysis of the Factors Affecting Outcome

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Background: A lack of shoulder abduction in spontaneously recovered birth brachial plexus palsy (BBPP) is a common presentation. We have performed a soft tissue release operation in these patients to remove the tethering effect of the tight and co-contracting shoulder abductors. This study was undertaken in order to assess the outcome of this surgical procedure.

Methods: We performed a retrospective analysis of 120 patients who displayed spontaneous recovery from BBPP and subsequently underwent soft tissue release procedure to improve shoulder abduction. The operation involved release of the pectoralis major, latissimus dorsi (LD) and teres major (TM) with axillary nerve neurolysis and transfer of LD and TM to teres minor at a lower position. Outcomes were assessed at a minimum follow up of two years. The primary outcome measures were range of shoulder abduction and Mallet score. Parents were interviewed and their satisfaction was graded on a Likert scale. We also explored prognostic factors responsible for better outcomes namely, age at operation, extent of involvement; preoperative shoulder abduction range, internal rotation deformity, triceps power and Mallet score.

Results: The average patient age was 5.8 years (range 1–17). Follow up ranged from 2-6 years. Average preoperative shoulder abduction was 85° (range 30°–140°). Postoperatively the average shoulder abduction was 161° (range 80°–180°). The mean improvement in abduction was 76° (range 20°–110°) [p < 0.001]. Mallet score improved from 16.4 to 19.5 (p < 0.001). High parental satisfaction was recorded by Likert scale assessment. Regression analysis indicated a favourable outcome in patients who are younger, have a better preoperative abduction range and a preoperative triceps power > grade 3.

Conclusions: Soft tissue release procedure employed in this series is effective in improving shoulder abduction. Patients who are of younger age, have better preoperative abduction and triceps power of > grade 3 are expected to achieve the best outcome.

Keywords: Brachial plexus, Birth palsy, Obstetric palsy, Modified quad operation, Shoulder deformity, Secondary procedure

INTRODUCTION

Birth brachial plexus palsy (BBPP) is a low energy injury in comparison to the adult brachial plexus injury and spontaneous recovery commonly occurs. Secondary deformities can occur during spontaneous recovery due to muscle imbalance and co-contractions from cross innervations. The most common injury involves C5-C6 (46%) and the shoulder is the typical site of secondary deformity, often presenting as a lack of shoulder abduction.

Several procedures to correct the shoulder deformi-