

Contralateral C7 Transfer via the Prespinal and Retropharyngeal Route to Repair C6 and C8 for Patients With Total Brachial Plexus Root Avulsion

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Objective: We sought to investigate a new way of neurotization to reconstruct the flexion of elbow, wrist, and finger of patients with total brachial plexus root avulsion. **Methods:** Nine patients were treated from October 2008 to November 2009. Their ages ranged from 6 to 45 years (average, 25 years). The operative delay was from 4 to 16 weeks (mean, 9 weeks). All patients had total brachial plexus avulsion, confirmed by intraoperative finding and electromyography. After a prespinal and retropharyngeal tunnel was made, the contralateral C7 nerve root was transferred to repair both C6 and C8 of the injured side via this route, with nerve grafting. The nerve graft was 5.61 ± 1.91 cm long for repairing C6 and 5.78 ± 2.32 cm long for repairing C8. **Results:** In 2 cases, we found early functional recovery of elbow flexion at the seventh month postoperatively. In all cases, we found recovery of elbow flexion at the 12th month postoperatively, and recovery of wrist and finger flexion at the 15th month postoperatively. **Conclusion:** This way of neurotization shortens the distance of nerve regeneration, and the nerve fibers of contralateral C7 are fully used to reconstruct the flexion of elbow, wrist, and finger. Results of follow-up show this method favors nerve regeneration and functional recovery.

Oberlin Procedure in Obstetric Brachial Plexus Palsy

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Objective: To present the functional results in obstetric brachial plexus palsy with Oberlin procedure. **Materials and Methods:** Between February 2010 and December 2015, 96 microsurgical explorations were performed in obstetric brachial plexus palsy, 42 cases presented C5-C6 or C5-C6-C7 compromise. In 17 cases, the Oberlin procedure was performed to restore the elbow flexion. Fourteen patients with complete follow-up of at least 12 months were included in this study. The power of elbow flexion was evaluated at 3, 6, 9, and 12 months with the Gilbert Score (M0-M3). The passive elbow motion and the functional active flexion (hand to mouth easy, hand to mouth difficult, active elbow flexion of 90°, and less than 90°) were assessed at the final follow-up. The results obtained at 6 and 9 months were compared with the final follow-up. The statistical analysis

was performed using Student *t* test. **Results:** The mean age at surgery was 6.86 months (range, 3-11 months), the average follow-up was 40.7 months (range, 12-67 months), muscular power postoperatively at 3 months was 1.07 M (range, 0-2), at 6 months was 2.07 M (range, 1-3), at 9 months was 2.86 M (range, 2-3), at 12 months was 2.93 M (range, 2-3), and at the final follow-up was 3 M on average. There were no significant differences between the results obtained at 9 months and at the final follow-up ($P = .15$). Statistically significant differences were found when compared with the results at 6 months and the final follow-up ($P = .0001$). A total of 10 patients had hand to mouth easily, 3 had difficulty, and 1 presented M3 active elbow flexion to 90°. No motor or sensitive alteration was presented in the hand. No cocontraction triceps-biceps was found. **Conclusion:** The Oberlin procedure is an excellent alternative to reanimate elbow flexion in obstetric brachial plexus palsy (OBPP), and the results obtained at 9 months are similar to the final follow-up.

Oberlin Procedure in Concomitant With Anterior Shoulder Release in Management of Upper Obstetric Brachial Plexus Palsy: Indications and Functional Outcomes (Noaman Procedure)

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Objective: Describe a new procedure that combines Oberlin procedure with concomitant shoulder release in Upper Obstetric Brachial Plexus Palsy. **Methods:** We present 18 children with upper obstetric brachial plexus palsy treated by transferring two motor fascicles out of the ulnar nerve to the biceps nerve in concomitant with anterior shoulder release. Eight were males, and 10 were females. The left-side brachial plexus was affected in 11 patients and the right side in 7 patients. Sixteen children had vaginal delivery and 2 children were delivered by cesarean section. The average birth weight was 3800 g (range, 3430-6000 g). Average age at the time of operation was 18 months (range, 12-26 months). The indication for the operation was absent active elbow flexion and no shoulder abduction with internal rotation contracture deformity. Oberlin's ulnar nerve transfer was done in all cases in concomitant with anterior shoulder release without brachial plexus exploration. **Results:** The average follow-up was 18 months (range, 12-58 months). Nine children had biceps muscle M5, 6 of them had biceps muscle M4, and 3 children had <M3. Twelve children gained full shoulder abduction and 6 of them gained less than 120° shoulder abduction. **Conclusion:** We recommend Oberlin's ulnar nerve transfer in concomitant with anterior shoulder release for upper-type obstetric brachial plexus