C7 nerve transfer

In brachial plexus injury with nerve root avulsions, the options for nerve reconstruction are limited. In select situations, half or all of the contralateral C7 nerve (CC7) root can be transferred to the injured side for brachial plexus reconstruction. Although encouraging results have been reported, CC7 transfer has not gained universal popularity.

The outcomes of hemi-CC7 transfer for restoration of shoulder motor function or median nerve function following posttraumatic brachial plexus injury do not justify the risk of donor-site morbidity, which includes possible permanent motor and sensory losses [1].

(CC7) transfer should be indicated only when other donor nerves are not available, and with a comprehensive knowledge of the potential risks [2].

Forty-one patients had undergone CC7 nerve transfer surgery at least 6 months previously and were assigned to one of 2 groups based on the duration of postoperative follow-up. Group 1 (n = 21) consisted of patients who had undergone surgery between 6 months and 2 years previously, and Group 2 (n = 20) consisted of patients who had undergone surgery more than 2 years previously. An additional 22 patients who underwent CC7 nerve transfer surgery later than those in Groups 1 and 2 were included as a control group (Group 3). Results of preoperative testing in these patients and postoperative testing in Groups 1 and 2 were compared. Testing included subjective assessments and objective examinations. An additional 3 patients had undergone surgery more than 6 months previously but had severe motor weakness and were therefore evaluated separately; these 3 patients were not included in any of the study groups.

The revised Short-Form McGill Pain Questionnaire (SF-MPQ-2) was the only subjective test that showed a significant difference between Group 3 and the other 2 groups, while no significant differences were found in objective sensory, motor, or dexterity outcomes. The interval from injury to surgery for patients with a normal SF-MPQ-2 score in Groups 1 and 2 was significantly less than for those with abnormal SF-MFQ-2 scores (2.4 ± 1.1 months vs 4.6 ± 2.9 months, p = 0.002). The 3 patients with obvious motor weakness showed a tendency to gradually recover.

Although some patients suffered from long-term sensory disturbances, resection of the C-7 nerve had little effect on the function of the donor limb. Shortening preoperative delay time can improve sensory recovery of the donor limb [3].

1)
Sammer DM, Kircher MF, Bishop AT, Spinner RJ, Shin AY. Hemi-contralateral C7 transfer in traumatic brachial plexus injuries: outcomes and complications. J Bone Joint Surg Am. 2012 Jan 18;94(2):131-7. doi: 10.2106/JBJS.J.01075. PubMed PMID: 22257999.
2)
Yang G, Chang KW, Chung KC. A Systematic Review of Outcomes of Contralateral C7 Transfer for the Treatment of Traumatic Brachial Plexus Injury: Part 2. Donor-Site Morbidity. Plast Reconstr Surg. 2015 Oct;136(4):480e-9e. doi: 10.1097/PRS.0000000000001616. Review. PubMed PMID: 26397267; PubMed Central PMCID: PMC4795155.
3)
Li XM, Yang JT, Hou Y, Yang Y, Qin BG, Fu G, Gu LQ. Donor-side morbidity after contralateral C-7 nerve transfer: results at a minimum of 6 months after surgery. J Neurosurg. 2015 Sep 11:1-8. [Epub ahead of print] PubMed PMID: 26361282.