Journal of Peripheral Nerve Surgery (Volume 1, No. 1, July 2017) 24-30

ORIGINAL ARTICLE

Functioning Free Gracilis Muscle Transfer for Restoration of Elbow Flexion in Adult Brachial Plexus Palsy - The Ganga Hospital Approach

Hari Venkatramani[1], Praveen Bhardwaj[2], S Raja Sabapathy[3]

Introduction

Global brachial plexus injury is a devastating injury and restitution of all functions is seldom possible. If the patient presents late, the few available options of early nerve surgery also become not applicable. In such situations functioning free muscle transfer may become the only option to restore some function. Functioning Free Muscle Transfer (FFMT) is a procedure in which a healthy muscle along with its vascular pedicle and motor nerve is harvested from a distant site and transferred to restore the lost function in a limb. Various workers in the field have established the order of priority in restoration of function and all stress the importance of elbow flexion as the primary step. Different strategies have been popularized by Barrie et al[1], Doi[2,3], Chuang[4], and Levin et al[5]. All of them performed FFMT for elbow flexion and this was combined with some other nerve transfer or another FFMT for finger flexion. Doi proposed FFMT as the primary procedure even when the patient is seen early[3]. Doi used a FFMT for elbow flexion and extended it to gain finger extension in stage one and performed a second FFMT for elbow extension and finger flexion at the second stage 6 months after the first FFMT. Chuang carried out nerve transfer for proximal function and finally FFMT for finger function[6]. The Mayo clinic surgeons found that when they used a FFMT to obtain both elbow flexion and finger extension the outcome was suboptimal and they have come to prefer to use one muscle for one function[7].

✉ Hari Venkatramani
Mobile: +91 9842202422
Email: drhariv@gmail.com

1 Senior Consultant, Department of Hand and Reconstructive surgery, No. 313, Mettupalayam Road, Saibaba Koil, Coimbatore, Tamil Nadu 641043

2 Consultant, Department of Hand and Reconstructive surgery, Coimbatore, Tamil Nadu

3 Senior Consultant and Director, Department of Hand and Reconstructive surgery, Coimbatore, Tamil Nadu

In adult global brachial plexus palsy FFMT is used to restore function,

A. following suboptimal spontaneous recovery.

B. when the injury - presentation interval is beyond 9 months.

C. when poor recovery is obtained following attempted nerve reconstruction.

Ganga Hospital Experience with FFMT in Global Brachial Plexus Palsy

The Ganga Hospital protocol for patients with adult brachial plexus palsy seen either late (more than 1 year) or where we failed to obtain adequate results after nerve transfer, is to first carry out a FFMT for elbow flexion. When we obtain Grade 4 power of elbow flexion following the FFMT, the wrist and the first carpo-metacarpal joints are fused. This usually occurs around 9 to 12 months after the FFMT procedure. The fusion of the wrist and the first CMC joint makes the part of the limb distal to the elbow function as a single unit during elbow flexion. Addosooki et al., found improved DASH score after wrist arthrodesis[8]. The wrist is arthrodesed in neutral position with the forearm in mid prone position and the first CMC joint with the thumb in full abduction and in line with the radial border of the index finger. With the wrist no longer dropping during the attempted flexion of the elbow, the patient finds elbow flexion easier. Ease of performance makes them attempt flexion of the elbow more often, there by strengthening the power of the transferred muscle. When the options for extensor reconstruction do not exist or are difficult to achieve and only finger flexors are to be reconstructed it is better to have the wrist in neutral position than in extension. This will help in greater arc of release of the fingers when the reconstructed flexors relax. As the third step, a second FFMT is carried out to gain finger flexion, 4-6 months after wrist fusion to obtain a hook grip. Spinal Accessory nerve is used as the donor nerve for the first FFMT and 3,4, 5 intercostal nerves are used to motor the second FFMT.