

## A hybrid technique of trapezius muscle transfer for a flail shoulder in late brachial plexus injuries

Sir,

Trapezius muscle transfer is an established method to provide stability and function to the flail shoulder joint in brachial plexus injuries (BPIs) after denervation atrophy of the involved muscles.<sup>[1]</sup> Two major variants of the surgical technique have been described.<sup>[2,3]</sup> Saha's<sup>[3]</sup> technique includes mobilising the trapezius muscle insertion along with lateral clavicle, acromion process and spine of the scapula, followed by their fixation to the humerus with the help of bone screws. Problems associated with this technique include longer surgery time, prolonged immobilisation, screw loosening, surgical-site infection and deformities after bony fracture. Singh and Karki<sup>[2]</sup> mobilised the trapezius insertion subperiosteally without bony osteotomies. The periosteal sleeve was used to secure the transfer to the deltoid muscle using non-absorbable sutures. There was no bony fixation with a strong reliance on postoperative splintage.

We planned trapezius muscle transfer to improve the shoulder function in a 6-year-old girl child who presented 1½ years after sustaining a traumatic upper BPI. She had already undergone neurolysis of the brachial plexus and Oberlin transfer for elbow flexion. Though the elbow flexion



**Figure 1:** Preoperative picture of the patient with flail right shoulder joint

recovered to power 4/5, the shoulder remained flail [Figure 1]. Classically described bony osteotomy might have injured the growth centres of shoulder girdle<sup>[4]</sup> in addition to the risks associated with bony osteotomy and fixation. A periosteal sleeve alone could be insufficient to secure the transfer in the child because of the delicate nature of soft tissues. We raised the trapezius insertion in a subperiosteal plane over the lateral part of the clavicle and the spine of the scapula. A 2-mm thick, 2 cm × 2 cm-chip of cartilage was harvested along with periosteum from the acromion process with a scalpel blade [Figure 2]. The periosteal sleeve was sutured to the deltoid muscle with non-absorbable sutures. The chondro-periosteal sleeve taken from the acromion process was secured to the upper fourth of the humerus with the help of two 4-mm-cannulated cancellous screws after roughening a part of the bone [Figures 3 and 4]. Plaster of Paris spica cast was applied postoperatively. The wound healed without complications. Shoulder abduction improved to 70°, 7 months postoperatively [Figure 5].

As compared to Singh *et al.*'s technique,<sup>[2]</sup> these techniques provide an additional and secure anchorage of the periosteal sleeve to the humerus bone with the help of cartilage chip and bone screws, till the periosteal healing is complete. This reduces the dependence on post-operative splintage. There is an additional possibility of osseochondral union as suggested by some studies.<sup>[5]</sup> There was a minimal increase in operative time, less implant load with good post-operative results and no implant-related complications.

### Declaration of patient consent

The authors certify that they have obtained all appropriate



**Figure 2:** Intraoperative picture showing the chip of cartilage harvested with the periosteal sleeve



Figure 3: Intraoperative picture showing the chondro-periosteal sleeve secured to the humerus with screws



Figure 4: Postoperative X-ray image showing fixation of screws in the humerus bone



Figure 5: Seven-month postoperative picture from the back side showing good true shoulder abduction

patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be

made to conceal their identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**Akhil Garg, K. S. Ajai, Satyaswarup Tripathy, Nirmal Raj Gopinathan<sup>1</sup>, Ramesh Kumar Sharma**

Departments of Plastic Surgery and <sup>1</sup>Orthopedics, PGIMER, Chandigarh, India

**Address for correspondence:**

Dr. Satyaswarup Tripathy,  
Department of Plastic Surgery, PGIMER, Chandigarh, India.  
E-mail: dr.sstripathy@gmail.com

**REFERENCES**

1. Rühmann O, Schmolke S, Bohnsack M, Carls J, Wirth CJ. Trapezius transfer in brachial plexus palsy. Correlation of the outcome with muscle power and operative technique. *J Bone Joint Surg Br* 2005;87:184-90.
2. Singh KA, Karki D. Modified trapezius transfer technique for restoration shoulder abduction in brachial plexus injury. *Indian J Plast Surg* 2007;40:39-45.
3. Saha AK. Surgery of the paralyzed and flail shoulder. *Acta Orthop Scand* 1967;38 Sup 9:3-90.
4. Kothary P, Rosenberg ZS. Skeletal developmental patterns in the acromial process and distal clavicle as observed by MRI. *Skeletal Radiol* 2015;44:207-15.
5. Hatayama K, Terauchi M, Yanagisawa S, Takagishi K. Histological evidence of successful internal fixation for traumatic chondral fracture of the femoral groove. *Asia Pac J Sports Med Arthrosc Rehabil Technol* 2014;1:106-11.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> <a href="http://www.ijps.org">www.ijps.org</a>
	<b>DOI:</b> 10.4103/ijps.IJPS_170_18

**How to cite this article:** Garg A, Ajai KS, Tripathy S, Gopinathan NR, Sharma RK. A hybrid technique of trapezius muscle transfer for a flail shoulder in late brachial plexus injuries. *Indian J Plast Surg* 2018;51:336-7.

© 2019 Indian Journal of Plastic Surgery | Published by Wolters Kluwer - Medknow