THE RESULTS OF OPPONENSPLASTIES IN LATE MEDIAN NERVE PALSY

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Abstract

We evaluated a total of 15 opponensplasty cases operated at Hand and Microsurgery Hospital Between 1988-1994.

There were 9 distal and 6 proximal median nerve injury cases according to being below or above the proximal of the forearm. For transfer, extensor muscles in 9 and flexor muscles in 6 cases were preferred.

The patients were assessed with regards to thumb opposition criteria determined by Sundararaj and Mani (1984), and the post-transfer strength of the muscle and tip pinch were measured by dynamometer.

7 patients were graded as excellent, 4 as good and 4 as poor. In other words, we obtained 73 % (11 out of 15 cases) excellent and good results. No relationship was observed between the results and the choice of motor muscles.

Complications were in four patients, in two patients we encountered tendon ruptures, and in two others flexion tendency of the wrist during opposition due to tight transfer.

Key Words : Median Nerve Palsy, Opponensplasty.

Introduction

Median nerve injuries occur on the arm, forearm or wrist isolated or combined with the injuries of bones, arteries, tendons, muscles and/or other nerves. The injury might be a laceration a puncture or a crush type. No matter what the type and the level of the injury, sensory restoration of the median nerve is indispensable for the basic function of the hand (6).

In the injuries of the forearm proximal zone and the ones above this, the functional reinnervation of the intrinsic muscles innervated by the median nerve is difficult. Likewise, in distal level median nerve injuries more than one year after the repair, functional reinnervation is not expected. Therefore, at the early stage of proximal level injuries and the late stage of distal level injuries, achieving thumb opposition with tendon transfer may be necessary.

Opposition is a combined movement which involves the palmar abduction and the pronation of the thumb. The conditions required for achieving the optimal opposition function are as follows :

a. absence of contracture of thumb adduction or pronation.

b. presence of adequate sense on the thumb.

c. presence of extension of thumb MP joint (2, 3, 4).

In this study, the results gathered from the opponensplasties we performed for median nerve injuries resulting from various etiological causes, are presented.

Material (s) and Method (s)

We observed a total of 15 opponensplasty cases operated at Hand and Microsurgery Hospital between 1988-1994. The youngest patient was 8, and

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the oldest was 43 years old, mean age 238 being 23,8. Nine of them were female, and 6 were male. According to their etiological classification, 5 had penetrating injures, 3 obstetrical paralysis, 2 congenital intrinsic paralysis and the other 5 various reasons causing median nerve injuries.

Regarding the injury level, there were 9 distal and 6 proximal median nerve injury cases according to being below or above 1/3 proximal of the forearm. 3 of the patients had only N. Medianus paralysis, whereas the others had nerve, artery or bone injuries accompanying this. The average period of time between the etiological cause and opponensplasty was 2.8 years.

While determining the technique of the operation, the strenght of the probable motor muscles, the patients occupation, the pre-operative passive mobility of the thumb joints and the condition of the first web distance were taken into account. First web widening was applied to the patients together with opponensplasty.

In patients who had opponensplasty, we chose extensor muscles for 9 and flexor muscles for 6 as motor muscles. These patients were immobilised for four weeks, and then had physiotherapy, for two weeks. Besides these, the tendon transfers were protected by an opposition splint for two months.

The patients were assessed in accordance with thumb opposition criteria developed by Sundararaj and Mani (1984) (Table 1), and the measurements of the post-transfer strength of the muscle and tip pinch were carried out by means of dynamometerm.

The minimum period of follow-up is 6 months, the maximum 72 (mean : 24).

Table I :

The Results of Opponensplasties in Late Median Nerve Palsy

Excellent	-	Thumb opposition to tip of ring or little finger with IP joint of thumb extended and more than 70 % of thumb function restored.
Good	-	Thumb opposition to tip of index or middle finger with IP joint of thumb extended and more than 50 % of thumb function restored...
Fair	-	Thumb opposition with flexion of its IP joint, and less than 50 % of thumb function restored.
Poor	-	No opposition.

Results

The list of the patients and the results are seen in table 1. We got excellent results in 7 patients, good in 4 and poor in 4. We assumed that fixed adduction and pronation contracture in one patient, the inadequacy of motor muscle strength in another with obstetrical paralysis and the post-operative rupture of tendon in the other two had a negative impact on the poor results.

No relationship was observed between the results and the choice of motor muscles. In patients who had EIP transfer, no lack of extension on the second finger was detected.

Transfer ruptures in two patients and flexion tendency of the wrist during opposition due to tight transfer in two others were observed as complications.

Discussion

In opponensplasty operations, the choice of motor muscle is made and the type of distal insertion of the tendon is selected by the surgeon depending on the level of injury and the pre-operative mobility of the thumb. In our cases, we preferred FDS and EIP muscles. Anderson (1992) reports that opponensplasty of FDS in rigid hands, and that of EIP in mobile hands have better results (1). Anderson and Lee (1992) reached 89 % excellent and good results in 50 EIP opponensplasties, and 85 % in 116 FDS opponensplasties. 73 % of our cases resulted excellent or good.

In the assesment of our cases, even the ones categorized as excellent according to Sundararaj and Mani, tip pinch strength could not exceed 45 % of that of the opposite/unaffected hand (average 17 %). We believe that not being able to realise a total intrinsic reconstruction of the thumb by means of opponensplasty and the post-transfer decrease of the muscle strength have an active role on this. Moreover, especially in patients with combined nerve injuries, the condition of the other fingers also effect tip pinch strength.

It is possible to reach a higher ratio of excellent and good results from opponensplasty operations. However, although the muscle strength of the transferred muscle can provide an approximately complete action of thumb opposition, it does not reach a complete thumb strength.

Table II.
Patients and Results

No	Name	Age	Sex	Injuries Level	Etiology	Combined Injuries	Motor Muscle	Function* Of The Thumb	Tip Pinch	Fallow Up	Results**
1	M.Ç. 88/693	40	M	Below	Traffic Accident	Pseudoartrosis of Ulna and Ulnar Nerve Lesions	FDS-4	40 %	20 %	72 Months	Fair
2	Y.E. 93/0180	30	F	Below	Home Accident (Glass Cut)	-	EIP	90 %	30 %	8 Months	Excellent
3	K.D. 94/1249	33	M	Below	Work Accident	- Replantation -	FCU	40 %		6 Months	Poor
4	S.G. 94/1249	14	M	Below	Congenital	-	EIP	100 %	40 %	10 Months	Excellent
5	T.G. 91/0808	43	M	Above	Traffic Accident	Subtotaly Amputation	EIP	20 %	0 %	24 Months	Fair
6	S.K. 88/0132	40	F	Below	Home Accident (Glass Cut)	N. Ulnaris Lesion	FDP-4	90 %	40 %	72 Months	Excellent
7	S.M. 93/0664	9	F	Above	Fall	Supracondilary Humerus Fracture N. Ulnaris Lesions	EIP	66 %	25 %	12 Months	Good
8	M.G. 93/1164	20	M	Below	Home Accident (Glass Cut)	Flexor Tendon + U. Artery Lesions	FDS-3	100 %	45 %	14 Months	Excellent
9	S.T. 88/0893	36	F	Below	Home Accident (Glass Cut)	FPL Lesion	FDS-4	82 %	40 %	60 Months	Good
10	K.A. 93/0180	10	M	Below	Home Accident (Glass Cut)	N. Ulnaris + Flexor Tendon Lesions	EIP	100 %	45 %	12 Months	Excellent
11	C.T. 89/0258	10	F	Above	Obstetrical Palsy	"	EDM	61 %	0 %	7 Months	Good
12	D.C. 91/0552	22	M	Above	Obstetrical Palsy	"	EIP	26 %	0 %	36 Months	Fair
13	A.O. 93/1022	12	F	Above	Congenital	"	EIP	87 %	0 %	7 Months	Excellent
14	H.B. 94/0639	20	M	Below	Electric Burn	Flexor Tendon + N. Ulnaris Lesions	EIP	76 %	25 %	6 Months	Excellent
15	M.T. 88/0804	12	M	Above	Obstetrical Palsy	"	FDS-4	77 %	0 %	48 Months	Good

* According to Mackin, E.J., Callahan, A.D. Scala (6).
** According to Sundararaj ve Mani Classification (Table 1).

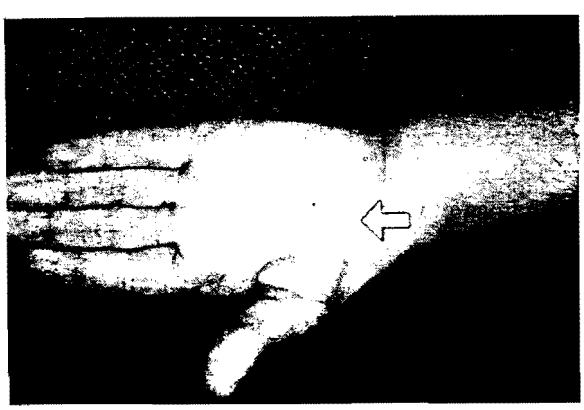

Figure 1: The course of the transfered tendon is seen traversing from pisiform area to the MP joint of the thumb.

Figure 2 : Full opposiotion of the thumb.

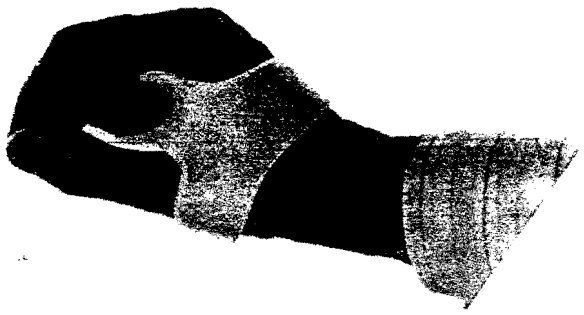

Figure 3: Opposition Spliant

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