ORIGINAL RESEARCH PAPER

Plastic Surgery

A STUDY ON RESULTS OF DELAYED REPAIR OF ULNAR NERVE IN ZONE V WRIST INJURIES IN A TERTIARY CARE HOSPITAL

KEY WORDS: Peripheral Nerve Injury (PNI), Ulnar Nerve, delayed epineural repair, interpositional cable graft

Pritha Rakshit*

Mch Plastic Surgery, Consultant, Department of Plastic Surgery, Apollo Multispeciality Hospitals Limited, Kolkata, India*Corresponding Author

ABSTRACT

Background: Traumatic injury to peripheral nerves in forearm and wrist can cause significant deficits and impaired functional recovery. Median and ulnar nerve injuries are examples of such lesions, occurring as isolated or combined injury of both nerves. In contrast to the central nervous system, peripheral nerves have the ability of regenerating. This ability has been utilized for a long time in the treatment of peripheral nerve injuries. **Study design:** Prospective, interventional, institution based, conducted at Apollo Multispeciality Hospitals, Kolkata, India. Method: Our study includes 10 patients operated over a period of 6 months; all patients underwent delayed repair of ulnar nerve in zone v area due to late presentation; end to end coaptation and epineural repair could be done in 8 patients; 2 patients needed interpositional sural nerve cable graft; all patients were followed up for 1 year without any significant complications; only one patient with autograft had weakness in adduction and abduction of fingers. **Conclusion:** Direct nerve repair yields the best results and nerve autografts remain the gold standard treatment for nerve gaps.

INTRODUCTION

Peripheral nerve injuries can result in significant functional disability and decreased quality of life because of permanently impaired sensory and motor functions and secondary problems such as neuropathic pain. Such symptoms can have major social consequences in terms of prolonged absence from work and sick leave [1].

The incidence of peripheral nerve injury (PNI) is around 2-5% of poly-trauma victims, and treating patients with PNIs in the trauma setting is particularly challenging. Associated central nervous system, orthopedic, and vascular injuries easily confound the diagnosis of nerve injuries [2].

The conventional treatment for PNIs is repair using microsurgical techniques, either by primary nerve suture, secondary (delayed) repair, or nerve graft, but continuous studies to find more successful methods that could improve recovery is ongoing. Their treatment sometimes leads to functional recovery but is mostly incomplete or uncertain, despite the regular use of refined techniques of repair, and the surgeon must comprehend the peripheral nervous system's responses to injury, which include degenerating as well as spontaneous regenerating abilities [3].

The surgical treatment of PNIs is still a taxing and highly demanding procedure. The results have been improved upon by different advances in microsurgical techniques. However, the results are not always satisfying, making secondary procedures inevitable. Thus, secondary procedures such as tendon transfers and joint arthrodesis must be taken into account during reconstructive planning [4].

This study shows the results of delayed surgical repair techniques for peripheral nerve recovery following traumatic PNIs.

METHODOLOGY:

This prospective, interventional, institution based study was conducted at Apollo Multispeciality Hospitals, Kolkata, and included 10 patients in the age group of 20-70 years, presenting with old zone v wrist injuries(time since injury > 6 weeks), operated over a period of 6 months – during January 2021-June 2021; all patients underwent delayed repair of transected ulnar nerve in wrist due to late presentation; end to end coaptation and epineural repair was achieved in 8 patients, and 2 patients needed sural nerve interpositional cable graft as the gap between the nerve ends was > 3 cm. Immobilization of the wrist joint using a splint was done for 3 weeks. Postoperative physiotherapy was started after removal of the splint. Follow up was done by serial clinical examinations; all patients were seen postoperatively at 4 weeks for initial 3 months, and then at 2 monthly intervals for 1 year. Range of movement, and return of strength and sensation, were tested and documented on each visit. Follow-up electrodiagnostic studies were carried out every 3 months to detect early signs of muscle reinnervation.

RESULTS

The results at the end of follow up were analyzed according to the scaling system followed by the Medical Research Council (MRC) developed in 1954. All 8 patients with end to end epineural repair and one with nerve graft achieved motor nerve recovery of M4 or better and sensory nerve recovery of S3 or better. One of the two patients who needed nerve graft, attained motor nerve recovery of M3 and sensory nerve recovery of S2.

TABLE 1 – General Details

SERIAL NO	AGE IN YEARS	TIME SINCE INJURY	MOTOR RECOVERY	SENSORY RECOVERY
1	22	3 MONTHS	M5	S4
2	25	6 MONTHS	M4	S3
3	28	4 MONTHS	M5	S4
4	32	3 MONTHS	M5	S4
5	35	6 MONTHS	M4	S3
6	23	9 MONTHS	M3	S2
7	26	2 MONTHS	M5	S4
8	31	7 MONTHS	M4	S3
9	37	3 MONTHS	M5	S4
10	29	5 MONTHS	M5	S4

Figure 1a – ulnar nerve ends dissected, 1b – end to end epineural repair

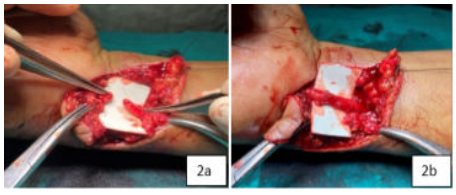

Figure 2a – ulnar nerve ends coapted, 2b – direct epineural repair

CONCLUSION

Functional nerve recovery after nerve repair depends on motor axons correctly matched to motor endplates and sensory axons reaching their sensory receptors. Most studies have graded the success of nerve repair using the Medical Research Council's system for the evaluation of motor and sensory return. Physical examination after direct nerve coaptation achieved very good (M4S3+) recovery. The results of nerve grafts were worse than that for nerve coaptation.

REFERENCES:

[1] Jaquet JB, Luijsterburg AJ, Kalmijn S, Kuypers PD, Hofman A, Hovius SE. Median, ulnar, and combined median-ulnar nerve injuries: functional outcome and return to productivity. J Trauma 2001; 51 :687-692
[2] Midha R, Guba A, Geniilif, Kline DG, Hudson AR. Peripheral nerve injection injury. In: Omer GE Spinner M, Venbeek AL, editors. Management of peripheral nerve problems. Philadelphia, PA: W.B. Saunders 2008; 406-413.
[3] Rosberg HE, Carlsson KS, Dahlin LB. Prospective study of patients with injuries to the hand and forearm: costs, function, and general health. Scand J Plast Reconstr Surg Hand Surg 2005; 39 :360-369.
[4] Hudson TW, Evans GR, Schmidt CE. Engineering strategies for peripheral nerve repair. Orthop Clin North Am 2000; 31:485-498.