
Rehabilitation of extremity war injuries with lesion of peripheral nerves in "PRAXIS" Centre for Physical Medicine and Rehabilitation, Sarajevo

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Summary

Polytrauma with significant lesion of peripheral nerves is a specific war injury. It is also one of the most delicate problems in rehabilitation treatment because it requires a close cooperation with surgeon and timely surgical interventions.

Based on our experience, the best results in the treatment of injured persons with lesion of peripheral nerves have been accomplished after the surgical treatment. Results in the neurolysis were better than those accomplished in neurorrhaphy.

Total of 436 patients with lesion of peripheral nerves were recorded and 56 patients with plexus lesion. Out of this number, 78 patients (about 15%) had surgical treatment

(41 neurorrhaphy and 37 neurolysis).

Due to lack of adequate ENMG diagnostics, the objective valorisation of treatment outcome was not possible.

Key words: war injures, peripheral nerves lesion, rehabilitation.

Introduction

Characteristics of war injuries are polytrauma with severe damage of tissue and peripheral nerves lesion. Consequences of the injuries accompanied with nervous system damage are delicate rehabilitation problem. Like in all other injuries, success of the therapy depends on timely and adequate surgical treatment of patients and proper rehabilitation concept for every single case. It also depends on application of all available classic and modern treatment devices, on long-term work with patients and optimal active patient participation.

Material and methods

Data about treatment results of all patients with extremity peripheral nerves lesion, in ambulance "PRAXIS" during the period from 1993 to 1996, were analysed. Physical treatment results were valorised as estimation of a success. Success of treatment is expressed as results of clinical condition after treatment, objectively valorised by using following scheme:

- **Grade "0" - zero:** unchangeable condition (without treatment results),
- **Grade "2" - two:** minimal changes,
- **Grade "3" - three:** satisfied functional changes with consequence (sensory or motor),
- **Grade "4" - four:** good changes and satisfied function restitution with minimal consequence,
- **Grade "5" - five:** good restitution without consequence of injuries or diseases.

Using retrospective analysis we registered and sorted all patients with war peripheral nerve lesion that were treated surgically or conservative, with physical medicine procedures and rehabilitation methods in Centre for Physical Medicine and Rehabilitation "PRAXIS". Using a clinical and neurology findings, physiology measurement as manual muscle test, muscle tonus and contraction tests and sensibility, we valorised a success of the treatment for every single patient. Data are expressed according to mentioned scheme using scale from 5 to 0. Gained results are statistically calculated and presented in tables and graphics.

Results and discussion

In Centre for Physical Medicine and Rehabilitation "PRAXIS", there were 454 or 28% patients with peripheral nerve system injuries in the 4 years period (Table 1)

According to location of lesion:

- n. ishiadicus 98 (21.5% of all isolated nerve lesion)
- n. ulnaris 74 (16.3%)

It is treated 59 surgically treated patients (12.9%)

- neurorrhaphy procedure done in 30 patients
- neurolysis procedure done in 29 patients (Table 2)

Plexus injuries had 55 patients (12%)

- plexus brachialis 37 patients (8%)
- L/S plexus 18 patients (4%)

It is registered 230 (50.6%) patients with peripheral nerve injures of arms and 224 patients (49.4%) with injures of legs.

Table 1 presents figures about the peripheral nerve injury structures. All of 454 of injured patients with nerve lesion have been surgically treated after the report.

Evaluation of the success of carried medical rehabilitation in patients with peripheral nerve lesions is presented in Table 2 and Graph 2. Only 5% of patients have no consequences after the rehabilitation. It is significant that almost half of the patients (43%) have a minimal consequence. About one fifth (19%) have a minimal consequence after medical rehabilitation.

Table 2. Evaluation of the success of treatment of patients with peripheral nerve lesion treated in ambulance "PRAXIS" in the period 1993 - 1996

5 (complete restitution)	23	5.06%
4 (with minimal consequences)	197	43.39%
3 (satisfied functional restitution)	148	32.59%
2 and 1 (with minimal changes)	70	15.42%
0 (without changes)	16	3.52%

Discussion

Based on experience of "PRAXIS" Centre for Physical Medicine and Rehabilitation, peripheral nerve lesions are

one of the most delicate problems in medical rehabilitation. There are many reasons for that:

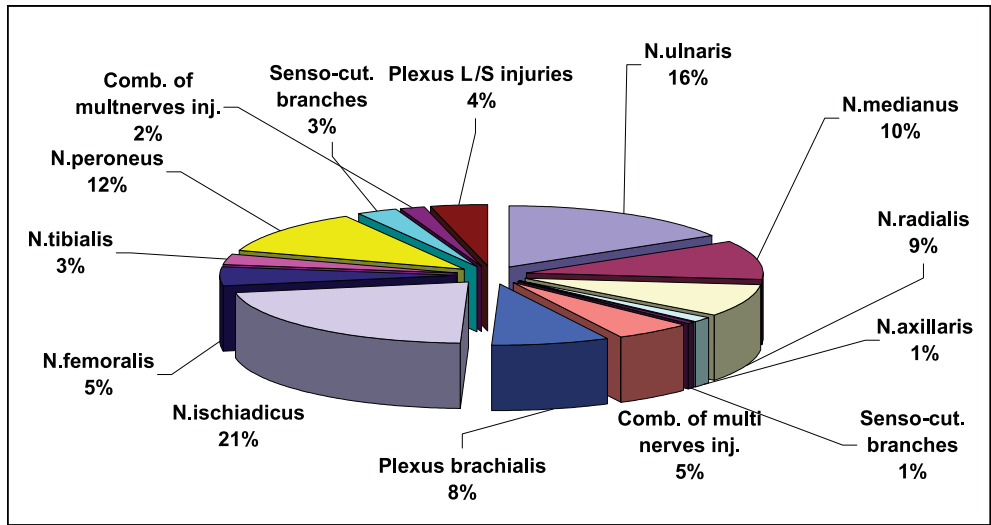
- massive peripheral nerve lesions in war victims reach an epidemic level
- long duration of the treatment, persistence and patience of therapist and patients
- inadequate diagnostic procedure (ENMG was not in work in Sarajevo during the war)
- multiple injuries with combined muscle, bone and vascular structure lesions.

Results of conservative treatment of peripheral nerve injuries in the war show that application of standard physical procedure with electro-acupuncture stimulation (own experience) is successful in high percentage. If physical treatment starts earlier and carries out long enough, success is indicatively higher. Everyday patient-physician contact during the treatment is very important because of psychological moment and continuous monitoring of objective conditions. Contact is necessary for timely neurosurgery and plastic surgery cooperative intervention, which should increase, in high percentage (average 81%), functional status of patients. Out of 454 treated patients with peripheral nerves lesions in "PRAXIS", according to clinical parameters, the best results were obtained at isolated n. ulnaris lesion (72%), but according to functional status the best results were at n.

Table 1. Structure of no surgically and surgically treated patients with peripheral nerves lesion treated in the period 1993-1996 in "PRAXIS"

N. ulnaris	74	32.20%	6	7	13 (18.9%)
N. medianus	47	20.40%	1	3	4 (8.5%)
N. radialis	39	17.00%	3	2	5 (12.8%)
N. axillaris	6	2.60%	0	0	0
Senso-cutaneous branches	3	1.30%	1	0	1 (33.3%)
Combined multineve injuries	24	10.40%	7	7	14 (58.3%)
Plexus brachialis injuries	37	16.00%	1	2	3 (8.1%)
Total of nerves injuries of arms	230	100.00%	19	21	40 (18.2%)
N. ischiadicus	98	43.75 %	9	5	14 (14.3%)
N. femoralis	22	9.82 %	0	0	0
N. tibialis	13	5.81 %	2	1	3 (23%)
N. peroneus	53	23.66 %	1	1	2 (3.8%)
Senso-cutaneous branches	13	5.81 %	0	0	0
Combined multineve injuries	7	3.12 %	0	0	0
Plexus L/S injuries	18	8.03 %	0	0	0
TOTAL	224	100.00 %	12	7	19 (8.48%)
Total of nerve injuries of legs	454		31	28	59 (12.9%)

Graph 1. Peripheral nerves injuries structure of patients treated in ambulance "PRAXIS" in the period 1993 - 1996



medianus lesion (94%). The poorest results were obtained in n. ischiadicus complete lesion (52%) and isolated n. peroneus lesion (65.7%).

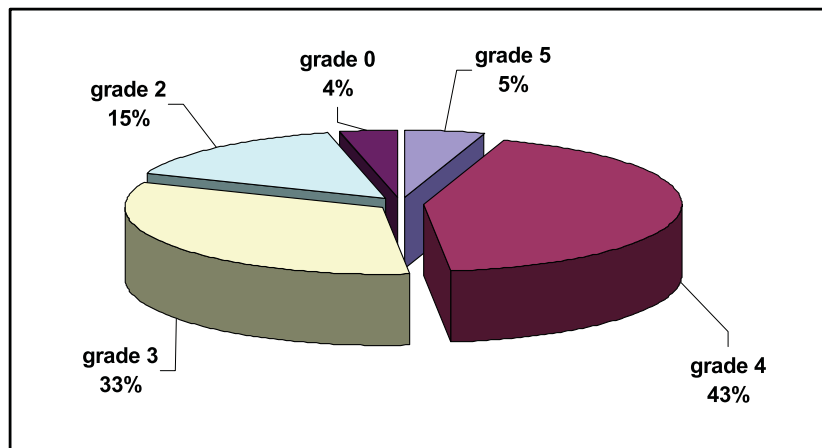
War injuries were diverse, mostly combined and multiply locomotor system injuries with peripheral nerves lesions (10.7%).

Some of injuries treated in "PRAXIS" (total 454 cases) were plexus injuries (cervicalis and L/S - 55 injures) and n. ischiadicus injuries (98 injures).

From other isolated nerve lesions, the most registered were injuries of n. ulnaris (74 cases or 17%) and injures of n. peronealis (53 cases or 12%).

After rehabilitation treatment there was only 5% of patients without consequences. It is indicative that almost half of the patients (43%) had a minimal consequence. About one fifth (19%) had a minimal consequence after medical rehabilitation.

Graph 2. Success of the treatment of patients with nerve lesion of arms treated in ambulance "PRAXIS" in the period 1993-1996



Conclusion

Treatment of war peripheral nerve lesion is important from the point of view of carrying out a medical rehabilitation measurement (10.7% of all heavy war injures). In spite of difficult working conditions in war period, it was possible to achieve good results by using a complex approach to every single case, with persistence and patience work and patient motivation to be engaged in own rehabilitation.

Treatment should be long, started as soon as possible

after the injury, with application of all available methods, especially electro stimulation, individually programmed kinesio- therapy, massage and thermo therapeutic procedures.

Application of electro-acupuncture stimulation on acupuncture spots was useful for fast and successful rehabilitation in most of the patients.

There was no ENMG diagnostic procedure to help in differentiation of the number of sub clinical lesions, following a success of the treatment and final condition evaluation.

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