

Post-traumatic neuroma due to closed nerve injury. Is recovery after peripheral nerve trauma related to ultrasonographic neuroma size?



Daniele Coraci^{a,b}, Costanza Pazzaglia^b, Pietro Emiliano Doneddu^c, Carmen Erra^d,
Ilaria Paolasso^b, Valter Santilli^{a,e}, Luca Padua^{b,d,*}

^a Board of Physical Medicine and Rehabilitation, Department of Orthopaedic Science, "Sapienza" University, Rome, Italy

^b Don Carlo Gnocchi ONLUS Foundation, Milan, Italy

^c Department of Clinical and Experimental Medicine, University of Sassari, Sassari, Italy

^d Department of Geriatrics, Neurosciences and Orthopaedics, Università Cattolica del Sacro Cuore, Rome, Italy

^e Physical Medicine and Rehabilitation Unit, Azienda Policlinico Umberto I, Rome, Italy

ARTICLE INFO

Article history:

Received 3 August 2015

Received in revised form 29 October 2015

Accepted 30 October 2015

Available online 2 November 2015

Keywords:

Peripheral nerve trauma

Neuroma

Ultrasound

Rehabilitation

Surgery

ABSTRACT

Objective: traumatic neuroma is a pathological condition of peripheral nervous system consisting of localized proliferation of injured nerve elements. The symptoms depend on the type of involved nerve (motor and/or sensitive) and on the site and the extension of the lesion. Ultrasound is the best tool to depict the morphology of nerve, especially in traumatic conditions. We present a study aimed to assess the correlation between the degree of nerve function and the ultrasound morphology of neuromas.

Patients and methods: we retrospectively evaluated 18 patients with neuromas (not transected) occurred after a closed nerve trauma evaluated with clinical and ultrasound assessment. The clinical evaluation was related to the % of increase of cross sectional area as detected by nerve ultrasound respect to normal nerve.

Results: we observed that dimensions of neuromas are not related to function until neuroma have cross sectional area 5 times enlarged respect to normal nerve, in this case recovery never occurs.

Conclusion: our study failed to clear detect a relation between cross sectional area enlargement of neuroma and nerve function, but showed a cut off beyond which prognosis is negative. This result provide some useful information for prognosis, nevertheless we believe that future perspective studies are needed to better understand the timing of developing neuromas and its evolution.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Peripheral nerve injuries are classified from an anatomopathological and prognostic point of view according the Seddon and the Sunderland classes [1,2]. Seddon describes three classes of nerve damage (neurapraxia, neurotmesis and axonotmesis) while Sunderland subdivided axonotmesis into three types with different degrees of nerve disruption and different capabilities for spontaneous regeneration.

Although this classification was developed several decades ago, for several aspects is still useful. In particular, in presence of neurotmesis (nerve and nerve sheath are disrupted) surgical indication is needed while in presence of axonotmesis (axons, and their myelin

sheath are damaged, but Schwann cells, the endoneurium, perineurium and epineurium remain intact) a "wait and see" approach is conceivable because regeneration may occur [1,2]. However, unfortunately, regeneration sometimes could be abnormal and disordered, being itself an obstacle to recovery from the nerve injury. This could happen in case of a traumatic neuroma, that represents a hyper-plastic, disordered, reparative response of the nerve to injury and in some cases presents as a palpable nodule mass [3]. Symptoms of neuroma are variable, mainly depending on the type of involved nerve (motor and/or sensitive), the site and the extension of the lesion.

Several studies demonstrated the role of ultrasound (US) as a diagnostic tool in the field of traumatic peripheral nerve injuries [4–6]. In particular, US has demonstrated its utility in confirming and/or excluding the presence of suspected injuries [7]. Moreover, it represents an appropriate tool for planning the treatment, preventing unnecessary surgery where conservative/rehabilitative management is sufficient and thus improving overall outcomes [8]. In case of neuromas, US allows the visualization of nerve continuity,

* Corresponding author at: Università Cattolica del Sacro Cuore, L.go F. Vito 1, 00168 Rome (IT); Don Carlo Gnocchi ONLUS Foundation, P.le Morandi, 6, 20121 Milan (IT). Tel.: +39 0630156623.

E-mail address: lpadua@rm.unicatt.it (L. Padua).

Table 1

Clinical and ultrasonographic characteristic of studied sample and follow-up data.

Patient	Age	Gender	Trauma	Involved nerve	CSA (mm ²)	Cut off	%I-CSA	MRC TO	MRC follow-up
Pt 1	44	F	Ot	Ulnar	38	10	380.0	3	4
Pt 2	77	F	Fr	PIN	4	3	133.3	0	0
Pt 3	29	M	Fr	PIN	7	3	233.3	3	–
Pt 4	50	M	Fr	PIN	10	3	333.3	0	0
Pt 5	50	M	Fr	Radial	10	8	125.0	0	0
Pt 6	27	M	Ot	Fibular	71	10	710.0	0	0
Pt 7	51	F	Fr	Median	32	8	400.0	3	4
Pt 8	29	M	Ot	Fibular	60	10	600.0	0	0
Pt 9	61	F	Ot	Median	42	12	350.0	1	2
Pt 10	66	F	Ot	Median	30	12	250.0	3	–
Pt 11	49	F	Fr	Radial	11	8	137.5	0	0
Pt 12	26	M	Fr	Radial	19	8	237.5	4	5
Pt 13	29	M	C	Median	53	12	441.7	3	4
Pt 14	18	M	Ot	Fibular	192	12	1600.0	0	0
Pt 15	41	F	Ot	Ulnar	21	8	262.5	0	0
Pt 16	30	M	Ot	Median	44	12	366.7	4	5
Pt 17	47	M	Fr	PIN	9	3	300.0	1	2
Pt 18	72	M	Fr	Radial	25	8	312.5	2	3

Abbreviations: Pt: patient; F: female; M: male; Ot: other; Fr: fracture; C: injury cut of the skin; PIN: posterior interosseous nerve; CSA: cross sectional area; %I-CSA: percentage of increased CSA; MRC: Medical Research Council.

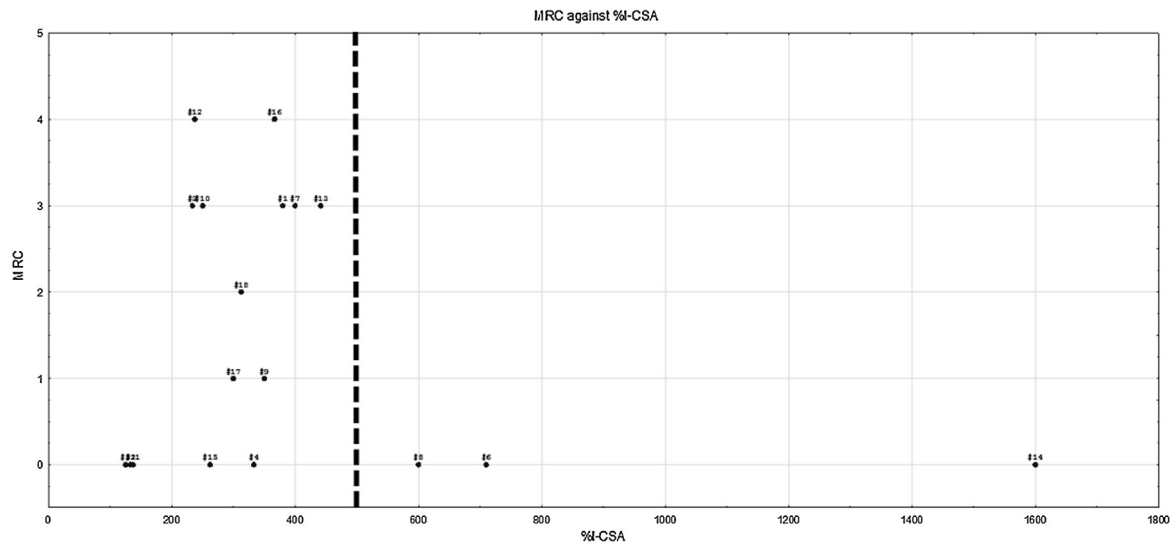


Fig. 1. Scatter plot of MRC values against %I-CSA. The vertical line represents the limits of %I-CSA of 500%.

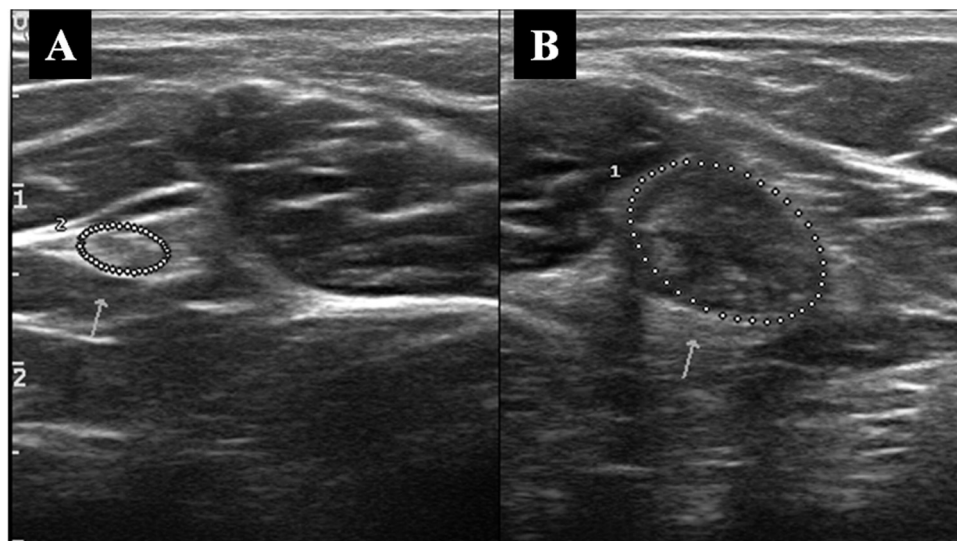


Fig. 2. (Pt 6 in tables), (A) normal fibular nerve at popliteal fossa (CSA = 10 mm²), (B) neuroma of fibular nerve at popliteal fossa (CSA = 71 mm²) showing a %I-CSA = 710.

Download English Version:

<https://daneshyari.com/en/article/3039802>

Download Persian Version:

<https://daneshyari.com/article/3039802>

[Daneshyari.com](https://daneshyari.com)