

# EVALUATION OF BOSTON QUESTIONNAIRE APPLIED AT LATE POST-OPERATIVE PERIOD OF CARPAL TUNNEL SYNDROME OPERATED WITH THE PAINÉ RETINACULATOME THROUGH PALMAR PORT

LIA MIYAMOTO MEIRELLES<sup>1</sup>, JOÃO BAPTISTA GOMES DOS SANTOS<sup>2</sup>, LUCIANA LEONEL DOS SANTOS<sup>3</sup>, MARCO AURELIO BRANCO<sup>4</sup>, FLAVIO FALOPPA<sup>5</sup>, VILNEI MATTIOLI LEITE<sup>6</sup>, CARLOS HENRIQUE FERNANDES<sup>7</sup>

## SUMMARY

Between the years of 1995 and 1998, 112 surgeries were performed for treating Carpal Tunnel Syndrome (CTS) using the technique of palmar incision employing the Paine retinaculum.

With the objective of analyzing results in the long-term, the patients were called for review. Forty four patients returned.

From these, three patients were excluded due to associated diseases, thus resulting in a total of 53 hands assessed.

Here we present the results of the subjective evaluation achieved by applying a self-assessment test called Boston questionnaire. This questionnaire consists of questions evaluating symptoms severity and functional status at the

moment of its application.

By applying this questionnaire, we found a score of  $1.41 \pm 0.57$  for symptoms severity and of  $1.59 \pm 0.93$  for functional status. As this questionnaire was not applied at the pre-operative period for those patients assessed, its scores were thus compared to those found in pertinent literature.

The achieved results show that post-operative scores are similar to those described in literature, even when reported in different postoperative follow-up times, thereby concluding that when symptoms are improved, the Boston questionnaire is sensitive to that clinical change.

**Keywords:** Questionnaires; Carpal tunnel syndrome; Disability evaluation.

## INTRODUCTION

Carpal tunnel is the anatomical region where flexor tendons of fingers and the median nerve are found. Tunnel's roof is formed by flexors retinaculum, also called carpal transverse ligament. The retinaculum is a fibrous band, 2.5-3.5 mm thick and 3 – 4 cm large, immediately above the median nerve. The carpal tunnel syndrome (CTS) is characterized by median nerve compression on the area in which it crosses the carpal region. Compression may occur due to a reduction of tunnel's inner diameter or due to an increased volume of the structures comprised in it. Anatomical studies show that the narrowest region of the tunnel is distal to

the level of the hamate hamulus and that during wrist flexion, nerve compression occurs through the proximal margin of flexors retinaculum<sup>(1,2)</sup>.

Many publications about CTS surgical treatment report excellent results and low complication rates<sup>(3,4)</sup>, while others report many kinds of complications, such as the recurrence of the carpal tunnel syndrome<sup>(5,6,7)</sup>.

In the last few years, an increasing use of endoscopic methods for carpal tunnel release is noticed, intending to reduce morbidity and hasten the return to work<sup>(8,9)</sup>. Because there are many treatments and surgical techniques, it was required to develop studies evaluating those results. Among the several instruments proposed, the Boston questionnaire was developed, designed

Study conducted at the Department of Orthopaedics and Traumatology, Federal University of São Paulo – UNIFESP.

Correspondences to: Avenida Leônício de Magalhães 1021 – Jardim São Paulo – São Paulo - Cep: 02042-010 - E-mail: emeirelles@directnet.com.br

1 – Physical Therapist, expert in hand therapy, Medical College, USP.

2 – Master, PhD, Head of the Discipline of Hand and Upper Limb Surgery, UNIFESP.

3 – Resident Doctor of the Department of Orthopaedics and Traumatology, UNIFESP.

4 – Resident Doctor of the Department of Orthopaedics and Traumatology, UNIFESP.

5 – Chairman of the Department of Orthopaedics and Traumatology, UNIFESP.

6 – Full Professor, Head of the Discipline of Hand and Upper Limb Surgery, UNIFESP.

7 – Master, PhD, Doctor of the Discipline of Hand and Upper Limb Surgery, UNIFESP.

Received in: 07/25/05; approved in:09/29/05

to be applied in patients with carpal tunnel syndrome, with the purpose of evaluating the severity of symptoms and the degree of manual skill<sup>(10)</sup>.

This evaluation instrument was recognized as reproducible, valid, with internal consistency and able to respond to clinical changes, with a transcultural adaptation being performed and validated in our country by means of a study conducted at UNIFESP in 2003<sup>(11)</sup>.

The objective is to evaluate Boston questionnaire applied at the late postoperative period of carpal tunnel syndrome operated by means of Paine's retinaculotome through palmar port.

## MATERIALS AND METHODS

The present material comprehends 44 patients, totaling 57 hands submitted to surgical release of the carpal tunnel through palmar port and Paine<sup>®</sup> retinaculotome, with follow up of at least 5 years postoperatively.

Regarding related diseases, it was observed that 3 (5.2%) patients had other diseases such as stroke, AR and scleroderma, which were excluded in order to not to cause bias in the

Order #	Age	Gender	Dom. Hand	Affected hand	Oper. Hand	Surgery Date	F-up time (months)
1	62	F	R	Bilateral	R	04/03/95	117
2	77	F	L	Bilateral	L	01/04/95	116
3	68	F	R	Bilateral	R	26/04/95	116
4	66	F	R	Bilateral	L	30/06/95	113
5	57	F	R	Bilateral	L	17/07/95	112
6	45	F	R	Bilateral	R	26/09/95	110
7	63	F	R	R	R	29/09/95	110
8	70	F	R	R	R	02/10/95	110
9	49	F	R	Bilateral	R	17/10/95	109
10	54	F	R	R	R	14/11/95	108
11	49	F	R	Bilateral	R	20/11/95	108
12	56	F	R	Bilateral	L	19/12/95	107
13	46	F	R	Bilateral	R	22/01/96	106
14	53	F	Bilateral	Bilateral	R	24/01/96	106
15	53	F	Bilateral	Bilateral	L	09/02/96	106
16	46	F	R	Bilateral	L	11/03/96	105
17	45	F	R	Bilateral	R	12/03/96	105
18	46	F	R	Bilateral	L	12/03/96	105
19	47	F	R	Bilateral	L	15/03/96	103
20	60	F	R	Bilateral	R	27/03/96	105
21	57	F	R	Bilateral	R	16/04/96	104
22	45	F	R	Bilateral	L	17/04/96	104
23	57	F	R	Bilateral	R	08/05/96	103
24	56	F	R	Bilateral	R	18/06/96	101
25	47	F	R	Bilateral	R	21/06/96	100
26	47	F	R	R	R	26/06/96	101
27	46	F	R	Bilateral	R	10/07/96	101
28	49	F	R	Bilateral	L	19/07/96	101
29	49	F	R	Bilateral	L	22/07/96	100
30	65	F	R	Bilateral	L	02/08/96	98
31	65	F	R	Bilateral	R	13/09/96	97
32	60	F	R	Bilateral	R	07/10/96	98
33	69	F	R	R	R	09/10/96	96
34	70	F	R	Bilateral	R	09/10/96	96
35	58	F	R	Bilateral	R	28/10/96	97
36	59	F	R	Bilateral	R	20/11/96	96
37	65	F	R	Bilateral	R	27/01/97	94
38	58	F	R	Bilateral	R	31/01/97	94
39	58	F	R	Bilateral	L	19/02/97	94
40	65	F	R	Bilateral	L	28/02/97	93
41	57	F	Bilateral	Bilateral	R	18/03/97	93
42	69	F	Bilateral	Bilateral	R	19/03/97	93
43	57	F	Bilateral	Bilateral	L	22/04/97	92
44	65	F	R	Bilateral	L	06/05/97	89
45	49	F	R	Bilateral	R	21/05/97	91
46	61	F	R	R	R	07/07/97	89
47	47	F	R	Bilateral	R	30/07/97	89
48	51	F	R	Bilateral	R	09/10/97	84
49	59	F	R	Bilateral	R	14/10/97	84
50	56	F	R	Bilateral	L	14/10/97	84
51	39	F	R	Bilateral	R	09/12/97	82
52	59	M	R	Bilateral	R	16/12/97	82
53	57	F	R	Bilateral	L	03/02/98	80

Table 1 – Patients' Data.

results, therefore, with 41 patients and 53 hands being analyzed.

Time elapsed from surgery to evaluations ranged from 80 to 117 months, with an average of 97 months.

In Table 1, data concerning those 41 patients are described and chronologically listed from surgery day, according to the order number, age in years, gender, dominant side, affected side, operated side, surgery date and current follow-up time in months.

The evaluation routine consisted of calling patients by telegram or phone. Reaching to the infirmary, the patient was re-evaluated by the doctor.

The Boston questionnaire, Annex 1, properly translated and validated into Portuguese, was applied to all patients returning for evaluation.

The Boston questionnaire is self-applied and evaluates the severity of symptoms and the functional status of patients with carpal tunnel syndrome. The symptoms severity scale (SSS) evaluates symptoms regarding severity, frequency, time and kind. The functional status scale (FSS) evaluates how the syndrome affects daily life.

Questions concerning symptoms severity scale are composed of 11

questions addressing: pain intensity during daytime and nighttime, time of pain during the day, dormancy, weakness, tingling sensation at night, frequency of that night tingling sensation, and skill. Each question has five answers numbered from 1 to 5, arranged in an increasing order of symptoms severity. Therefore, 1 means no symptoms, 2 mild symptoms, 3 moderate symptoms, 4 intense symptoms, and 5 severe symptoms.

Questions concerning functional status are composed of 8 questions, where each one corresponds to a functional activity (writing, buttoning clothes, holding a book while reading, holding a telephone hang, housekeeping, opening a glass vial cap, carrying market bags, bathing and dressing). Each activity has five difficulty degrees, labeled according to a table shown at the end of the question, where degree 1 corresponds

## ANNEX 1

### SELF-EVALUATION PROTOCOL – BOSTON PROTOCOL

Name: .....  
 RGHSP: ..... Hand: ( ) Right ( ) Left  
 Evaluation Date: ...../...../..... Surgery Date: ...../...../.....

#### THE FOLLOWING QUESTIONS REFER TO YOUR SYMPTOMS WITHIN A TYPICAL PERIOD OF 24 HOURS, DURING THE LAST TWO WEEKS.

(Choose one answer in each question)

- 1) How strong is the pain on your hand or wrist at night?
  - 1- I feel no pain on hand or wrist at night.
  - 2- little pain
  - 3- moderate pain
  - 4- intense pain
  - 5- severe pain
- 2) How many times did your hand or wrist pain wake you up in a typical night for the last two weeks?
  - 1- never
  - 2- once
  - 3- twice or three times
  - 4- four to five times
  - 5- more than five times
- 3) Do you usually feel hand or wrist pain during the day?
  - 1- I never feel pain during the day
  - 2- I feel little pain during the day
  - 3- I feel moderate pain during the day
  - 4- I feel intense pain during the day
  - 5- I feel severe pain during the day
- 4) How often do you feel hand or wrist pain during the day?
  - 1- never
  - 2- once or twice a day
  - 3- three to five times a day
  - 4- more than five times a day
  - 5- constant pain
- 5) In average, how long do daytime pain episodes last?
  - 1- I never feel pain during the day
  - 2- less than 10 minutes
  - 3- from 10 to 60 minutes
  - 4- more than 60 minutes
  - 5- I feel constant pain during the day
- 6) Do you feel your hand dormant (lost sensitiveness)?
  - 1- no
  - 2- I feel little dormancy
  - 3- I feel moderate dormancy
  - 4- I feel intense dormancy
  - 5- I feel severe dormancy
- 7) Do you feel weakness on your hand or wrist?
  - 1- no weakness
  - 2- little weakness
  - 3- moderate weakness
  - 4- intense weakness
  - 5- severe weakness

- 8) Do you feel a tingling sensation on your hand?
  - 1- no tingling sensation
  - 2- little tingling sensation
  - 3- moderate tingling sensation
  - 4- intense tingling sensation
  - 5- severe tingling sensation
- 9) How strong is dormancy (lost sensitivity) or tingling sensation at night?
  - 1- I never feel dormancy or tingling sensation at night
  - 2- little
  - 3- moderate
  - 4- intense
  - 5- severe
- 10) How often did dormancy or tingling sensation wake you up during a typical night for the last two weeks?
  - 1- never
  - 2- once
  - 3- twice to three times
  - 4- four to five times
  - 5- more than five times
- 11) How difficult do you feel in taking and using small objects, such as keys or pens?
  - 1- not difficult
  - 2- a little difficult
  - 3- moderately difficult
  - 4- very difficult
  - 5- severely difficult

#### IN A TYPICAL DAY FOR THE LAST TWO WEEKS, HAVE YOUR HAND OR WRIST SYMPTOMS BROUGHT ANY DIFFICULTY IN PERFORMING THE ACTIVITIES LISTED BELOW?

Please, circle the number that best describes your ability to perform the activity.

ACTIVITY	DEGREE OF DIFFICULTY				
	1	2	3	4	5
Writing					
Buttoning clothes					
Holding a book while reading					
Holding the telephone hang					
Housekeeping					
Opening a glass vial cap					
Carrying market bags					
Bathing and dressing					

No difficulty .....	1
Little difficulty .....	2
Moderate difficulty .....	3
Intense difficulty .....	4
Cannot perform the activity at all due to hands and wrists symptoms .....	5

Investigator's opinion: .....

to no difficulty, degree 2 little difficulty, degree 3 moderate difficulty, degree 4 intense difficulty, and degree 5 cannot perform the activity at all due to hands and wrists symptoms.

All answers should be concerned to the symptoms within a typical period of 24 hours, for the last two weeks.

For the self-appraisal, patients were guided into a room, where they received a copy of the questionnaire. After a brief explanation of what the questions were about and how to answer those questions, patients were left on their own to answer the questionnaire.

The patients should answer to the 11 first questions choosing only one alternative. Regarding the last eight questions, they should select the degree of difficulty felt in each activity described, according to the label on the questionnaire itself.

In case a patient had both hands operated, two questionnaires should be applied, one for each hand. From answers, two scores were calculated. The symptoms severity score (SSS) refers to the first 11 questions.

The functional status score (FSS) refers to the last 8 questions. This calculation is the sum of answers divided by the number of questions. Unanswered questions were excluded from calculation.

Answers were listed and analyzed (Table 2).

An average of the answers for each question was calculated, aiming a careful analysis of results for each question (Table 3).

## RESULTS

By applying the Boston questionnaire, we found a symptoms severity score (SSS) of  $1.41 \pm 0.57$  and a functional status score (FSS) of  $1.59 \pm 0.93$ . In the analysis by question, the highest averages were found for symptoms severity in questions number 4, 5 and 7 (S4, S5, and S7), and, for functional status, in questions number 5, 6, and 7 (F5, F6 and F7). (Table 3, Graphs 1 and 2).

## DISCUSSION

By analyzing the age group affected, we see that the mean age ranges from 44 years old<sup>(12)</sup>, 46 years old<sup>(13)</sup>,

56 years old<sup>(14)</sup> and 57 years old<sup>(10)</sup>. In this study group, ages ranged from 45 to 70 years old, with an average of 57. In our study, the incidence of females is higher, as reported in other studies<sup>(12,14)</sup>.

The condition affected bilaterally 47 (88.67%) patients, followed by 6 (11.32%) on the right hand, and 0 on the left hand. This order is consistent to findings of other authors<sup>(15,16)</sup>.

In comparative studies, postoperative follow-up time using the Boston questionnaire as an evaluation instrument was 1 – 6 months in a study<sup>(14)</sup> and 3 – 6 months in another study<sup>(12)</sup>.

Patients' follow-up ranged from 80 to 117 months, with an average of 97 months. No long-term follow-up studies were found.

Many instruments are used to evaluate the results of carpal tunnel treatment. Among them, the nervous conduction study, symptom inspection, sensitivity test, tweezing and prehension strength measurement, complication rates, pain and skill degree evaluation, return to work and functional ability<sup>(17)</sup>.

Studies on carpal tunnel release usually get to outcomes where patients report symptoms relief and functional improvement<sup>(18)</sup>, but, until not so long ago, subjective results were not standardized or properly measured.

Quality of life measurement instruments were developed, based on patient's opinion, in order to scientifically evaluate subjective results in a surgical intervention. Initially, generic questionnaires were developed, such as, for example, the SF-36 (short form 36), which consists of 36 questions comprehending physical, mental and social aspects as well as a person's welfare as a whole, with few specific questions. Over time, the need for specific questionnaires became evident. In 1995, a questionnaire was developed to measure upper limb results – DASH (Disabilities of the arm, shoulder, and hand). It consists of 30 items measuring function, symptoms, and quality of life relative to pathologies of the upper limb<sup>(19)</sup>. Among others, we can also find the PRWE (patient-rated wrist evaluation), which consists of 15 questions evaluating pain and functional disability, where the patient evaluates his/ her own ability and degree of domain in personal care, work, housekeeping and leisure.

Some authors demonstrated that those scientific me-

Nr.	BOSTON PROTOCOL																		SCORE			
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	F1	F2	F3	F4	F5	F6	F7	F8	SSS	FSS	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
4	1	1	2	3	2	1	1	1	2	1	1	1	1	1	1	1	5	1	1	1,45	1,50	
5	1	1	2	4	3	1	4	1	1	1	1	1	1	1	1	1	1	5	1	1,82	1,50	
6	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1,27	1,00	
7	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1,09	1,13	
8	2	1	1	2	2	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1,55	1,13	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
10	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1,18	1,00	
11	1	1	2	2	2	1	2	1	1	1	2	4	4	4	4	5	4	4	3	1,45	4,00	
12	1	1	2	2	2	2	2	2	2	2	3	1	2	1	1	3	4	4	1	1,91	2,13	
13	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1,18	1,00	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
16	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1,09	1,00	
17	2	5	2	5	5	2	3	2	2	5	3	3	3	4	3	4	4	4	2	3,27	3,38	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1,00	1,50	
19	1	1	2	2	2	3	4	2	1	1	3	4	4	4	4	4	4	4	4	2,00	4,00	
20	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1,09	1,00	
21	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1,09	1,00	
22	2	5	3	5	5	4	3	2	3	4	3	3	3	4	3	4	3	4	4	3,55	3,50	
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
24	3	3	2	2	2	1	2	1	1	2	2	2	2	3	2	4	2	5	2	1,91	2,75	
25	1	1	2	2	2	1	5	3	2	1	3	3	3	3	4	4	4	4	4	2,09	3,63	
26	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	2	1	1,18	1,13	
27	1	1	1	2	1	1	3	1	1	1	1		1	1	1	3	3	3	1	1,27	1,63	
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
29	1	1	2	2	2	1	3	1	1	1	2	4	3	4	4	5	4	4	4	1,55	4,00	
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
32	4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1,64	1,00	
33	1	1	3	1	5	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1,55	1,13	
34	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
35	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1,09	1,00	
36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
37	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	3	4	1	1,09	1,63	
38	2	1	2	1	1	2	1	2	2	1	2	1	1	1	1	3	3	2	1	1,55	1,63	
39	2	1	2	1	1	2	2	2	2	1	2		1	1	1	3	3	2	1	1,64	1,50	
40	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	3	4	1	1,09	1,63	
41	1	1	1	1	1	3	1	2	4	1	1	1	3	1	1	2	1	1	1	1,55	1,38	
42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
43	1	1	1	1	1	2	1	1	1	1	4	1	3	1	1	2	1	1	1	1,36	1,38	
44	1	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	3	1	1,82	1,38	
45	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
46	2	2	2	1	2	1	2	1	1	1	1	1	1	1	1	2	2	1	1	1,45	1,25	
47	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1,27	1,00	
48	1	1	1	1	1	1	1	1	2	2	3	3	3	1	2	3	5	5	3	1,36	3,13	
49	4	3	4	5	5	2	4	2	2	3	2	3	1	3	4		3	5	1	3,27	2,50	
50	2	2	2	2	2	1	2	1	1	1	2	2	3	2	3	4	2	5	2	1,64	2,88	
51	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,00	1,00	
52	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1,18	1,00	
53	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1,18	1,00	
																				AVERAGE	1,41	1,59
																				S.D.	0,57	0,93

S1 to S11 = symptom 1 to symptom 11; F1 to F8 = function 1 to function 8

Table 2 – Answers to Boston questionnaire.

**BOSTON PROTOCOL**

S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	F1	F2	F3	F4	F5	F6	F7	F8
1,28	1,3	1,43	1,51	1,55	1,34	1,74	1,32	1,34	1,26	1,43	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1,4	1,45	1,42	1,43	1,75	1,85	2,06	1,36
68	67	76	80	82	71	92	69	71	67	76	74	77	75	76	94	98	109	72

Table 3 – Answers Averages.

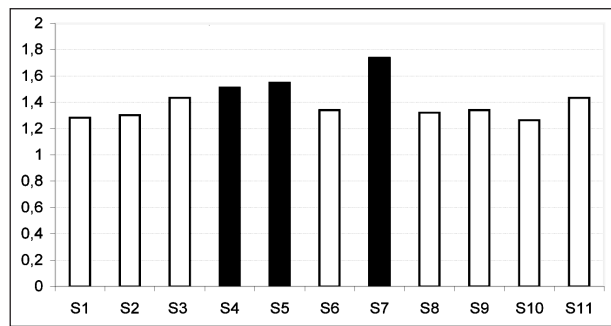
asurements of a patient's opinion are more sensitive to clinical changes after treatment than data provided by physical examination performed by the surgeon him/herself (17,20,21,23).

The Boston questionnaire was employed, which also provided a standardization of those subjective outcomes, due to its reproducibility, coherence, validity and sensitivity to clinical changes. We noticed that there are scarce studies in literature making a long-term postoperative evaluation employing the Boston questionnaire.

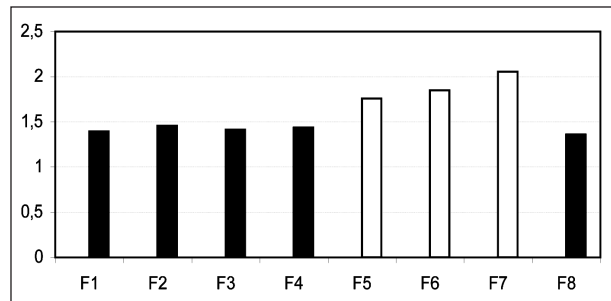
In one of the comparative studies, the Boston questionnaire was used to compare electrophysiological results in a carpal tunnel syndrome postoperative follow-up(14). A similar study was published in 2002 by another author (12). Both could not find any correlation between nervous sensitive conduction speed and the Boston questionnaire.

One hundred fourteen patients were assessed, by comparing the Katz-Stirrat(25) hand diagram, in which the patient him/ herself marks the areas of symptoms distribution on a diagram, classifying the disease into Classic or Probable, possible and unlikely, with the results of the Boston questionnaire. Patients categorized as Classic or Probable achieved a symptoms severity score higher than the scores for possible and unlikely categories(24).

We conducted a comparative study on scores found in other studies, including the results by Levine, regarding postoperative follow-up



Graph 1 – Analysis of Questions - Symptoms.



Graph 2 – Analysis of Questions - Functions.

during the day S4, time of pain episodes during the day S5) and muscle weakness (presence of muscular weakness S7), and, concerning the functional status, activities related to strength (housekeeping F5, open a glass vial cap F6, and carry market bags F7). Anyway, scores were overall low, indicating a non-severe picture.

During questionnaire application, we observed that the patients were in doubt to answer questions especially regarding pain, because, in the majority of the

cases, they experienced other kinds of pain, such as arthrosis, trigger or tendonitis, which could confuse answers.

In our study, a lot of difficulty was seen on understanding the labels of the functional status evaluation, requiring the investigator to repeat the explanation many times. Another important difficulty seen was in the moment of evaluating the degree of difficulty for

	EGS	EEF
Padua et al.	1,5±0,6	1,5±0,6
Mumcu et al.	2,1±0,7	1,9±1,0
Levine et al.	1,9±1,0	2,0±1,1
Meirelles et al.	1,41±0,59	1,59±0,93

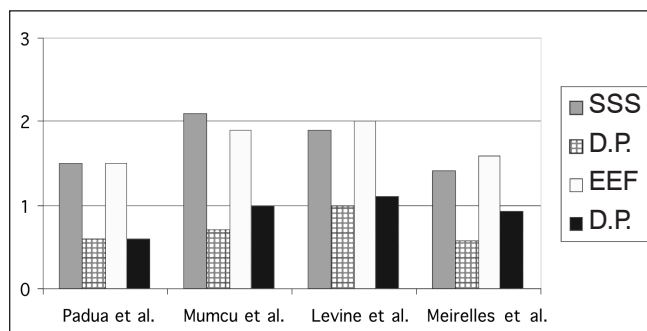


Table 4 – Comparison of studies.

## ANNEX 2

### COMPARISON BETWEEN BOTH LABELS (A AND B)

ACTIVITY	DEGREE OF DIFFICULTY				
Writing	1	2	3	4	5
Buttoning clothes	1	2	3	4	5
Holding a book while reading	1	2	3	4	5
Holding the telephone hang	1	2	3	4	5
Housekeeping	1	2	3	4	5
Opening a glass vial cap	1	2	3	4	5
Carrying market bags	1	2	3	4	5
Bathing and dressing	1	2	3	4	5
No difficulty .....	1				
Little difficulty .....	2				
Moderate difficulty .....	3				
Intense difficulty .....	4				
Cannot perform the activity at all due to hands and wrists symptoms .....	5				

**A** – Validated by Campos et al.

Activity	No Difficulty	Mild Difficulty	Moderate Difficulty	Severe Symptoms	Cannot Do at All Due to Hand or wrist
Writing	1	2	3	4	5
Buttoning of clothes	1	2	3	4	5
Holding a book while reading	1	2	3	4	5
Gripping of a telephone receiver	1	2	3	4	5
Opening of jars	1	2	3	4	5
Household chores	1	2	3	4	5
Carrying of grocery bags	1	2	3	4	5
Bathing and dressing	1	2	3	4	5

**B** - Original by Levine et.al

item 'writing', because, when the dominant hand was not to be evaluated, it was impossible to answer, with two patients leaving the answer in blank and the others giving random answers.

In this last question concerning functional status, the questionnaire originally describes the label above each number, while at validation, the label was exhibited at the end of the question, which, in our opinion, made its comprehension difficult (Annex 2).

## CONCLUSION

Patients operated through palmar port technique using the Paine retinaculotome remain happy with their surgical outcomes, even after a long follow-up time, according to the results of the Boston questionnaire.

The last portion of the questionnaire was shown to be confused and difficult to understand in what concerns to functional status.

## REFERENCES

- Tanzer RC. The carpal - túnel syndrome: a clinical and anatomical study. *J Bone Joint Surg Am.* 1959; 41:626-34.
- Cobb TK; Dalley BK; Posterapo RH, Lewis, RC. Anatomy of the flexor retinaculum. *J Hand Surg Am.* 1993; 18:91-9.
- Phalen GS. The carpal tunnel syndrome. *J Bone Joint Surg Am.* 1966; 48:211-28.
- Omer GE Jr. Median nerve compression at the wrist. *Hand Clin.* 1992; 8:317-24.
- Seradge H, Seradge E. Pilo-triquetral paqin syndrome after carpal tunnel release. *J Hand Surg Am.* 1989; 14:858-62.
- Zumiotti AV, Ohno PE, Prada FS, Azze RJ. Complicações do tratamento cirúrgico da síndrome do túnel do carpo. *Rev. Bras Ortop* 1996; 31:199-202.
- Kluge W, Simpson RG, Nicol AC. Late complications after open carpal tunnel decompression. *J Hand Surg Br.* 1996; 21:205-7.
- Agee JM, McCarroll HR, Tortosa RD, Berry DA, Szabo, RM, Peimer CA. Endoscopic release of the carpal tunnel: a randomized prospective multicenter study. *J Hand Surg Am.* 1992; 17:987-95.
- Chow JCY. Endoscopic release of the carpal ligament: a new technique for carpal tunnel syndrome. *Arthroscopy.* 1989; 5:19-24.
- Levine DW, Simmons BP, Koris MJ, Daltroy LH, Hohl GG, Fossel AH, et al. A self-administered questionnaire for the assessment of severity of symptoms and functional status in carpal tunnel syndrome. *J Bone Joint Surg Am.* 1993; 75:1585-92.
- Campos CC, Manzano GM, Andrade LB, Castelo A, Nóbrega JAM. Tradução e validação do questionário de avaliação de gravidade dos sintomas e do estado funcional da síndrome do túnel do carpo. *Arq Neuropsiq.* 2003; 61:51-5.
- Mumcu EF, Heybeli N, Kutluhan S, Demirci S, Kerman M. Assessment of outcome of carpal tunnel syndrome: a comparison of electrophysiological findings and a self-administered boston questionnaire. *J Hand Surg Br.* 2002; 27:259-64.
- You H, Simmons Z, Freivalds A, Kothari MJ, Naidu SH. Relationship between clinical symptom severity scales and nerve conduction measures in carpal tunnel syndrome. *Muscle Nerve.* 1999; 22:497-501.
- Padua L, Mondelli M, Reale F, Sicurelli F. Relationship between the self-administered boston questionnaire and electrophysiological findings in follow-up of surgically-treated carpal tunnel syndrome. *J Hand Surg Br.* 2000; 25:128-34.
- Cseuz KA, Thomas JE, Lambert EH, Love JG, Lipscomb PR. Long-term results of operation for carpal tunnel syndrome. *Mayo Clin Proc.* 1966; 41:232-41.
- Paine KWE, Polyzoidis KS. Carpal tunnel syndrome: decompression using the paine retinaculotome. *J Neurosurg.* 1983; 59:1031-6.
- Amadio PC, Silverstein MD, Ilstrup DM, Schleck CD, Jensen LM. Outcome after Colles fracture: the relative responsiveness of three questionnaires and physical examination measures. *J Hand Surg Am.* 1996; 21:781-87.
- Glowacki KA, Breen CJ, Sachar K, Weiss AP. Electrophysiological testing and carpal tunnel release outcome. *J Hand Surg Am.* 1996; 21:117-22.
- Hudak PL, Amadio PC, Bombardier C. The upper extremity collaborative group. Development of an upper extremity outcome measure: the DASH (disabilities of the arm, shoulder, and hand (sic)). *Am J Ind Med.* 1996; 29:602-8.
- Lohr KN. Advances in health status assessment: overview of the conference. *Med Care.* 1989; 27 (Suppl.):1-11.
- Katz JN, Gelberman RH, Wright EA, Lew RA, Liag MH. Responsiveness of self-reported and objective measures of disease severity in carpal tunnel syndrome. *Med Care.* 1994; 32:1127-33.
- Atroshi I, Johnsson R, Sprinchorn A. Self administered outcome instrument evaluated in carpal tunnel syndrome. *Acta Orthop Scand.* 1998; 69:82-8.
- Atroshi I, Breidenbach WC, McCabe SJ. Assessment of the carpal tunnel outcome instrument in patients with nerve-compression symptoms. *J Hand Surg Am.* 1997; 22: 222-7.
- Katz JN, Stirrat CR. A self-administered hand diagram for the diagnosis of carpal tunnel syndrome. *J Hand Surg Am.* 1990; 15:360-3.