The appearance of the median nerve during carpal tunnel release: Reliability of the surgeon’s grading of the degree of compression

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SJ McCabe. The appearance of the median nerve during carpal tunnel release: Reliability of the surgeon’s grading of the degree of compression. Can J Plast Surg 1994;2(4):169-170. The reliability of intraoperative grading of the degree of compression of the median nerve during carpal tunnel release has never been tested, even though the appearance of the median nerve at the time of release may contain valuable information regarding the degree of compression. This study used a survey design with high-quality colour photographs of the median nerve at the time of carpal tunnel release to test the reliability of 30 surgeons grading the degree of compression. An important degree of disagreement was found in 11% of the scores. The calculated reliability of 0.68, while not high enough to make individual treatment decisions based on the appearance of the nerve, is high enough to group patients for the purposes of clinical research.

Key Words: Carpal tunnel syndrome, Median nerve, Reliability

Aspect du nerf médian lors de la décompression du tunnel carpien : fiabilité de l’évaluation visuelle faite par le chirurgien

RÉSUMÉ : La fiabilité de l’évaluation peropératoire du degré de compression du nerf médian durant une intervention de décompression n’a encore jamais été mesurée, même si l’aspect du nerf médian au moment de la décompression pourrait révéler certains renseignements utiles à ce sujet. Cette étude se fonde sur un modèle de questionnaire, à l’aide de photographies couleur de grande qualité du nerf médian au moment de la décompression pour vérifier l’aptitude de 30 chirurgiens à mesurer avec précision le degré de compression. Une discordance marquée a été observée dans 11 % des scores enregistrés. La fiabilité calculée, de l’ordre de 0.68, quoique trop peu élevée pour prendre des décisions thérapeutiques individuelles sur la seule base de l’aspect du nerf, est suffisamment grande pour stratifier les patients à des fins de recherche clinique.

Before one can obtain evidence that an instrument is measuring what is intended, it is first necessary to gather evidence that the scale is measuring something in reproducible fashion” (1). This is the essence of reliability, which is expressed by the numbers 0 to 1.0, with 0 being no reliability and 1.0 indicating perfect reliability.

The degree of reliability required for a measurement instrument will depend on the intended use of the measurement. If the measurement score will be used to make decisions about individual patients, a very high reliability, approaching 0.9, should be achieved by the instrument (1). If, however, the scores will be used simply to compare groups for clinical research purposes, a measurement system with a much lower reliability can be accepted. At the time of carpal tunnel release, the appearance of the median nerve contains potentially valuable information regarding the degree of compression of the nerve. Such information could be useful for verification of the diagnosis of carpal tunnel syndrome, planning of the operative procedure, and predicting the prognosis following release. In addition, if the physician was evaluating a patient with a failed carpal tunnel release, a clear report of the degree of compression seen in the operating room could aid in subsequent management.

Typically, surgeons make an intraoperative estimate of the degree of compression of the nerve during carpal tunnel release. If the surgeon’s intraoperative grading of the degree of the compression was a reliable measure, this potentially useful information could be of great clinical and research value.

The purpose of this study was to determine if different
surgeons, looking at identical, high-quality photographs of
the median nerve at the time of carpal tunnel release, would
grade the nerve as having the same degree of compression.

MATERIALS AND METHODS

The Christine M Kleinert Institute for Hand and Micro
Surgery has developed a national network of hand surgeons
to coordinate and perform clinical research in the areas of
hand and microsurgery. This network currently involves
about 200 former hand surgery fellows of the institute. From
the network, 30 hand surgeons were randomly chosen for this
study.

Each of the 30 surgeons was mailed an identical series of
13 high-quality 5 x 7 colour photographs of the median nerve
during 13 different carpal tunnel procedures. The photo-
graphs were chosen to represent the range of compression
seen in the clinical situation. Each surgeon was then asked to
score the degree of compression seen for each median nerve
as ‘none’, ‘mild’, ‘moderate’, ‘severe’ or ‘extreme’. These
terms were chosen because they are commonly seen in opera-
tive reports of carpal tunnel release. No definition for these
terms were included, just the terms themselves.

The scores were tabulated, and analysis of variance
(ANOVA) was used to calculate the reliability using a standard
formula.

RESULTS

A response rate of 100% was achieved. Several partici-
pants, however, did not grade all photographs. The scores of
three surgeons not grading more than two photographs were
excluded, leaving 27 for the final analysis.

Not surprisingly, frequent disagreement was found among
the surgeons on the degree of compression shown in the
photographs. Importantly, assuming that disagreement by
two levels or more is significant, of the 4563 possible com-
parisons, there was significant disagreement in 11% of the
scores. Examples of such disagreements included ratings of
the degree of compression of a photograph of the same nerve
as none and moderate, mild and severe, or moderate and
extreme. There was disagreement on the ratings by three or
four levels in only 1% of the responses. In this situation, the
same photograph would be rated as none and severe by
different surgeons.

Most of the disagreement in grading was evident in the
central range of the scale, with more agreement when the
nerve seemed to be significantly constricted or essentially
normal. The reliability coefficient for the grading scale was
0.68.

DISCUSSION

Clearly, the reliability of 0.68 noted in this study is not
high enough for the intraoperative appearance of the nerve to
be used to direct the need for a modification of the surgical

ACKNOWLEDGEMENTS: The participation of surgeons in the
Christine M Kleinert Institute Former Fellows Research Network is
gratefully acknowledged.

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