EDITORIAL

Carpal tunnel syndrome

The term 'carpal tunnel syndrome' was first proposed by Paget in 1854. Initially all the cases were due to trauma around the wrist, notably distal radius fracture. It was not until 1938 when Moersch published a report on a patient with symptoms unrelated to trauma, hence the term idiopathic carpal tunnel syndrome. Carpal tunnel syndrome is the most common form of peripheral neuropathy, affecting around 0.1 to 1%[1] of the population with an estimated lifetime risk of 10%.[2] For any middle-aged woman who develops insidious onset of tingling and numbness of one or both hands that disturbs sleep at night, carpal tunnel syndrome stands high on the list of differential diagnoses.

Despite 70 years of intensive research and investigation, it remains unclear why the transverse carpal ligament arching the carpal tunnel should become abnormally thickened. Although the classical symptoms of carpal tunnel syndrome involve the radial three and half digits of the hand, patients often complain of numbness of the whole hand including all digits. It has been postulated that the Guyon canal, which is adjacent to the carpal tunnel and bounded by the hook of hamate and pisiform, may also be involved but to a lesser degree. Apart from expansion of the carpal tunnel, surgical decompression leads to similar pressure and morphological (shape and volume) changes in the Guyon canal, that have also been confirmed by magnetic resonance imaging.[3,4] The high prevalence (up to 80-94%) of communicating branches of the common digital nerves supplying the 3rd and 4th web space may also account for the variation of sensory symptoms in some individuals.[5]

For symptomatic cases resistant to conservative treatment or those with severe symptoms with objective motor and/or sensory deficit, surgical decompression would be the treatment of choice. Since Learmonth performed the first carpal tunnel decompression by dividing the transverse carpal ligament in 1933 and its subsequent popularisation by Phalen in 1950s, carpal tunnel release has become one of the most popular forms of hand surgery with high success rates of 70 to 98%.[6,7] However, scar morbidity such as prolonged tenderness and hypersensitivity accounts for most of the reported complications (up to 36%). This is due to the presence of rich cutaneous nerves across the palm, which are susceptible to iatrogenic injury or post-surgical scar entrapment.[8] Immediately after skin incision, surgeons should therefore look carefully for these tiny nerve twigs (using loupe magnification) and safeguard them before exploring the deeper transverse carpal ligament.

Recent advances in minimally invasive surgical techniques employing dedicated endoscopic instruments or special mini-open techniques aimed at avoiding or minimising surgical scars in the palm, curtailing postoperative pain, and reducing scar morbidity, whilst enabling better hand grip and earlier return to daily function and work. Endoscopic techniques were developed simultaneously in Japan and the United States in the late 1980s and first reported in the western literature in 1989. Such techniques were first introduced into Hong Kong in 1992, and after 15 years, they have become common procedures in almost all orthopaedic departments. However, there is still considerable controversy regarding the best form of surgical treatment, as several recent major meta-analyses have not revealed conclusive evidence as to the merit of any one technique. Boeckstyns and Sorensen[9] reported an incidence of major nerve injury of 0.3% and 0.2% after endoscopic and open carpal release, respectively; other complications occurred at about the same rate. Vasen et al[10] adopted a societal approach in analysing data, and concluded that endoscopic carpal tunnel release becomes more costly, only if: (1) the complication rate exceeds 6.2%, (2) the time-off work exceeds 15.5 months, and (3) the difference in time interval for returning to work is less than 21 days. A comprehensive review showed no difference in symptom relief and permanent nerve injury between the two techniques and concluded that endoscopic release might be associated with more reversible nerve injury but left patients with better grip strength and less scar tenderness.[11] We have conducted a prospective randomised controlled study comparing endoscopic release and mini-open carpal tunnel release in patients with bilateral carpal tunnel syndrome receiving simultaneous surgery on both hands. The latter resulted in marginal benefit; lesser postoperative pain and higher patient satisfaction, whilst major complication rates were similar in both groups.[12] However, after our paper was published, we encountered three major complications involving flexor tendons and median nerves in the mini-open technique group. This sobering experience reminds us that surgery still appears to be much safer if the entire ligament cutting process takes place under direct vision, as during endoscopic release. Thereafter, we have selected the endoscopic treatment as our preferred option. Thus it appears that the choice of surgery is still largely based on any given surgeon's experience and patient preference.

One of the difficulties in comparing surgical

techniques is the lack of consensus about the methodology and instrumentation employed for outcome measurement. Evaluation should not be based just on physical parameters; after all in most instances the symptoms perceived by patients are largely subjective. A globally accepted assessment system could avoid the barriers of geography, culture, and language. In this issue of the Journal, a paper by Fok et al[13] attempted to validate a widely accepted patient self-administered questionnaire for assessing symptom severity and functional status in carpal tunnel syndrome. This carefully conducted study involved a forward-backward translation of the questionnaire from English to Chinese (Hong Kong) and vice versa. Adaptation and modification was based on local patient characteristics and on a final validation test conducted in 50 patients with typical carpal tunnel syndrome. They achieved very good conceptual equivalence, reproducibility, reliability, and internal consistency.

Outcome of surgical treatment is compromised in long-standing cases of carpal tunnel syndrome with marked thenar muscle wasting. As thumb action generally constitutes 50% of overall hand function, daily activities are often limited by severely hampered hand functions. Every day tasks such as chopstick use, buttoning, and shoe-lacing can be affected. In another paper in this issue, Wan et al[14] report a series of elderly patients with severe carpal tunnel syndrome treated with the Camitz operation, who achieved satisfactory outcomes. This well-established operation involves the harvesting of the vestigial tendon of the palmaris longus, which is then transferred to the new position over the dorsal radial aspect of the thumb in order to augment the loss of palmar abduction and opposition of the thumb. They reported significant improvement in power, Kapandji score, and hand function test results with no major complication. Although the surgical idea is not novel, its use in our local population has not been published before. So this study provides concrete information for both clinicians and patients. The study also pointed out that in this group of patients with severe disease and delayed consultation time (mean, 14 months), recovery from sensory symptoms was not satisfactory, notwithstanding a well-conducted operation. The important message to all clinicians is that treatment of carpal tunnel syndrome should be started early, so as to avoid late complications and unsatisfactory treatment outcomes.

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