

Brachial Neuralgia and the Carpal Tunnel Syndrome

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Brit. med. J., 1968, 3, 470-471

Summary: The carpal tunnel syndrome can cause severe pain and disability, both of which are avoidable if the condition is diagnosed and treated early in its course. Two sets of circumstances—delay in the correct diagnosis and recurrence of symptoms after an apparently successful operation—may give rise to problems in these aspects of management and delay recovery.

Introduction

Cannon and Love (1946) and Brain, Wright, and Wilkinson (1947), by correlating a characteristic symptom complex with a compression lesion of the median nerve within the confines of the carpal tunnel, firmly established the carpal tunnel syndrome as a clinical entity. Since then it has come to be recognized that this condition is probably the commonest single cause of brachial neuralgia. The clinical features, the several possible causes of compression, and the relative merits of conservative and surgical treatment have been fully discussed elsewhere and are not considered here. Most patients with this disease present no difficulties in either diagnosis or treatment, but there are some with whom problems do arise, and they fall into two groups. In the first group the diagnosis is not readily apparent and the pain is attributed to other causes. As a result there may be months or even years of continuing disability before the correct diagnosis is made and effective treatment instituted. In the second group, though there seems to be no doubt about the diagnosis or the adequacy of the surgical decompression, the patients continue to complain of pain.

Patients and Results

In order to discuss these two not uncommon findings the case histories of 140 patients have been reviewed. All these patients were suffering from the carpal tunnel syndrome and were treated by flexor retinaculotomy during the four-year period 1964-7. According to his overall clinical course, each patient has been placed into one of four groups.

Group 1

Eighty-six patients (61.5%) form this group. Each one related the classical story of the syndrome and obtained immediate relief by the operation. Although their management was straightforward, two points of secondary interest emerge from the review:

(1) Twenty-eight of them—that is, almost one-third of the group—had suffered symptoms for six months or more, often severely and with considerable disability, before their referral to hospital. In almost every case the delay was the result of unfamiliarity with the condition by the patient's medical practitioner.

(2) Several months after an apparently successful operation six of the patients experienced a return of the same symptoms. For each of them a second retinaculotomy together with the

removal of part of the retinaculum has afforded lasting relief. At these second operations it was noted that the retinacula were very thickened and showed no signs of their previous slitting. Nevertheless, there is no reason to suppose that the original operations had been other than technically satisfactory, for an incomplete retinaculotomy affords no more than a few days of relief from symptoms. It would seem that in a few instances healing of the retinaculum can be followed by a true recurrence of the syndrome.

Group 2

The 21 patients (15%) in this group had been diagnosed initially as suffering from brachial neuralgia due to causes other than the carpal tunnel syndrome. They had all complained of pain extending from the neck down to the hand and fingers, and in all but two, in whom the pain was attributed to the presence of cervical ribs, cervical spondylosis had been diagnosed. The usual conservative methods of treatment for this condition, such as collar immobilization, traction, and heat, had all been tried without effect. Two patients had undergone cervical laminectomy and two others a facetectomy, but again without benefit. Eighteen of the patients showed radiological changes of degenerative spondylosis in the cervical spine, but in 12 of these the changes were no more than minimal.

Case 1.—The patient was a man aged 45. Five years previously he had had an accident at work in which he fell on to his outstretched right arm. Within two days of this accident he began to experience pain in the right arm extending from the neck to the hand. X-ray examination revealed the changes of spondylosis in the lower cervical spine, with narrowing of the C 5/6 disc interspace. The pain steadily became worse, and within three months he was unable to continue with his job as a joiner. For the following two and a half years he was unable to work, and all attempts at treatment were unavailing. Myelography showed some degree of compression of the right seventh cervical nerve root, and a facetectomy decompression of this root was performed. This operation brought no improvement. He was then referred for a further opinion, when it was noted that prominent features of the symptoms throughout his illness had been nocturnal paraesthesiae with early morning stiffness of the hand and numbness of the index and middle fingers. He also complained that pain was constantly precipitated or aggravated by attempts to hold his joiners' tools. Retinaculotomy was followed by immediate relief of all symptoms. He resumed his work two weeks later and has now been free of pain for two and a half years.

Case 2.—A woman aged 61 had for many years suffered from progressive pulmonary fibrosis and emphysema of unknown origin. For three years she had also been complaining of severe bilateral brachial neuralgia extending from the cervical region down to the fingers. X-ray examination showed extensive and gross changes of degenerative cervical spondylosis with narrowing of the C 5/6 and C 6/7 disc spaces and foraminal encroachment by osteophytes at the same levels. Facetectomy had been considered but then rejected because her respiratory state precluded general anaesthesia. When she was referred for a further opinion it was noted that many of her symptoms were those of the carpal tunnel syndrome. With the hope of relieving at least some of her suffering, both carpal tunnels were decompressed under local anaesthesia. The result was that her pains disappeared completely save for a minimal aching in the cervical region, which she said she had had for several years before her neuralgia began. She remained free of symptoms until she died 18 months later from her pulmonary disease.

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Between them these two histories contain all the important features of the group. Pain not only affected the whole arm but was often more severe in the cervical and shoulder girdle areas than in the forearm and hand. Seven of the male patients related the onset of their trouble to a fall on to the outstretched hand or the point of the shoulder. Movements of the head and neck did not affect, and, moreover, never had in any way affected, the pain in the arm, a feature that is felt to be very significant in diagnosis. Each patient's symptoms and signs in the forearm and hand in no way differed from those of the carpal tunnel syndrome, and all the patients obtained complete relief by carpal tunnel decompression.

Group 3

Twenty-eight patients (20%) presented with symptoms which immediately suggested the carpal tunnel syndrome, and in several of them this diagnosis was supported by delay in median nerve conduction velocities. Retinaculotomy seemed to be successful inasmuch as it promptly relieved the nocturnal paraesthesiae in the fingers, but shortly after starting to use the hand once more each of the patients complained that either he was no better or his pain had quickly recurred. Closer questioning revealed, in fact, that the present pain was not exactly the same as before, and, in particular, the nocturnal paraesthesiae and cramp were no longer felt. Examination showed that a second condition was now present. In 22 patients this second lesion was a de Quervain's stenosing tendonitis; in three it was an ulnar compression neuritis at the elbow; in two it was an acute tenosynovitis of the flexor pollicis longus; and in one it was an epicondylitis (tennis elbow). Treatment appropriate to the second lesion resulted in relief of pain and full use of the hand.

Group 4

Five patients (3.5%) complained of pain for which no cause could be found, and for which all attempts at conservative treatment had failed. Because of the unexpected yet complete response to carpal tunnel decompression observed in those in Group 2, the same procedure was carried out on these patients, but without success. In two cases it has since been discovered that the complaints were psychogenic, following on unsuccessful claims for compensation for relatively minor accidents at work. In the other three patients the nature of their condition remains unknown.

Discussion

The subjective symptoms in the carpal tunnel syndrome may range from an intermittent paraesthesia in the fingers to a persistent neuralgia affecting the whole arm. Moreover, in the latter case the patient may complain more of the pain in his neck and shoulder than of that in the forearm and hand.

Such an extensive distribution of pain has been noted before, but it has never received the emphasis it deserves, and the factors that determine the extent of pain in a particular patient are not known. It might be that the entrapment results in changes throughout the whole length of the involved axones, and these fibres then become subjected to pressure at other sites. Russell (1956) suggested that the essential change was located in the nerve sheaths, but he made no attempt to define its nature. Brain *et al.* (1947) described the naked-eye appearances of swelling of the median nerve immediately proximal to the carpal tunnel, and thereby started a controversy over the presence or absence of truly demonstrable changes in the nerve as a whole which has never been resolved. Whatever the reason, in brachial neuralgia from any cause there often is no correlation between the site of the lesion and the distribution of the pain, a conclusion also reached by Lishman and Russell (1961). Russell (1956), Miller (1956), and Wilkinson (1960) have warned against too readily implicating cervical spondylosis as the cause of a brachial neuralgia. The findings in the 21 patients of group 2 suggest that retinaculotomy should be considered in any patients with an extensive brachial neuralgia to which the carpal tunnel syndrome seems to be contributing in any degree.

That the quality of a pain is difficult not only to describe but also to remember is well illustrated by the 28 patients in group 3. They all complained of a recurrence or a persistence of their pain after operation, and it was only on careful questioning about the distribution and quality of the present pain that a second lesion was shown to exist. The most significant difference from the preoperative condition was that nocturnal paraesthesiae in the fingers no longer occurred, yet only a few patients volunteered this information. One of the causes of the carpal tunnel syndrome is a degenerative thickening of the flexor retinaculum, and it is not remarkable that similar changes should occur in retinacula elsewhere in the arm, thereby resulting in further stenosing tendonitides or nerve entrapments. It is well known that such conditions are particularly apt to cause trouble following a period of excessive unaccustomed activity or the resumption of activity after a period of immobilization. Most of the patients in this group had, in fact, been symptom-free after retinaculotomy until they started to use the hand once more.

I thank the several neurologists and neurosurgeons at the Newcastle Regional Neurological Centre who allowed me to treat these patients, and Dr. J. B. Foster for his helpful advice in this study.

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