Raynaud’s phenomenon in idiopathic carpal tunnel syndrome
POSTOPERATIVE ALTERATION IN ITS PREVALENCE
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In a previous study the prevalence of Raynaud’s phenomenon (RP) in patients with idiopathic carpal tunnel syndrome (CTS) was found to be 60% which is much higher than that in the general population. We undertook a further study of the same cohort of patients who had both CTS and RP and who had an open release of the carpal tunnel, to observe the effects of the operation on RP. We observed whether the symptoms of RP improved, and repeated the cold provocation tests to see if the arterial pulse which was decreased before operation would recover. We rated the outcome as good when the patients showed both an improvement of the symptoms of RP and a normal pulse amplitude as observed before operation. Of the 18 patients with both conditions, ten (56%) had good and four (22%) fair results, with a mean recovery time of 4.2 months (6 weeks to 1 year) after operation.

If the vasospasm seen in RP is an expression of vasomotor irritation in the carpal tunnel, these findings suggest that local compression of vasomotor fibres in the carpal tunnel can also be relieved by the release of this structure. Careful consideration, however, is still required in treating patients with both conditions since in some cases RP may be superimposed or it may have other origins.

Patients and Methods

We studied 18 patients diagnosed as having both idiopathic CTS and RP. They all had symptoms of CTS, such as paraesthesia, numbness and nocturnal pain in the fingers, more than one of the clinical signs of CTS such as the Tinel or Phalen, atrophy of the thenar muscles, and abnormal electromyographic (EMG) readings such as delayed nerve conduction distal to the wrist. The conduction time on the EMG was considered to be prolonged if the terminal latency of the motor impulse exceeded 4.5 ms or if the sensory antidromic latency was greater than 3.5 ms. All underwent surgery to release the volar carpal ligament and have been followed for more than a year.

This is the same cohort of patients which was studied in our previous report.1 The mean duration of symptoms of CTS was 5.7 years (2 months to 20 years). The condition was bilateral in 11 patients and unilateral in seven, but RP was present in both hands of all patients.

We performed carpal tunnel release in the affected hands of these patients, using the same open surgical procedure with a midpalm curved longitudinal skin incision, under local anaesthesia and pneumatic tourniquet. The palmar sensory branch of the median nerve was preserved. There were no complications such as wound infection. A cold provocation test for RP using photoplethysmography1,3 was performed at six weeks, three months, six months, and one year after the operation. We observed whether the symptoms of RP, particularly the hypersensitivity to cold exposure, improved, and we repeated cold-provocation tests to see if the amplitude of the arterial pulse which was decreased before operation would recover.

We rated the outcome as good in patients showing both an improvement of the symptoms of RP and a normal pulse amplitude after cold exposure, and fair in those with a considerably recovered pulse amplitude, i.e. more than two-
thirds of that before exposure. A result was considered poor when the patient persistently complained of cold hyper-
sensitivity or showed the same degree of decreased pulse
amplitude as observed before operation. The final grading
was given after an interval of at least a year. We defined the
recovery time as the interval between the operation and the
day when the patient first described his condition as better
than fair.

Results

Of the 18 patients, ten had good, four fair, and four poor
results. Ten patients (56%) were therefore regarded as
having recovered from RP and 14 (78%) improved at least
in the cold-provocation test. The mean time to recovery
was 4.2 months (6 weeks to 1 year). All 11 patients with
bilateral symptoms of CTS showed improvement of RP in
both hands but four patients out of seven with unilateral
involvement did not show recovery. The other three
patients with unilateral CTS differed in regard to their RP;
one showed recovery in the operated hand only and the
other two had improvement in both hands. The duration of
symptoms of CTS showed no significant correlation with
the recovery time of RP.

Discussion

The pathogenesis of RP remains unclear. The local or
systemic sympathetic nervous system, however, has been
considered to play a significant role in the constriction of
the digital arteries. The mechanism of RP in patients with
CTS is also uncertain. Vasomotor sympathetic fibres to the
fingers are mainly conducted through the median nerve, and
therefore the vasospasm seen in RP may be an expres-
sion of irritation of vasomotor fibres. This hypothesis is
relevant to the pathogenesis of RP. In this study, 56% of
patients with both conditions showed recovery from RP and
78% improved to some degree.

These results lend some support to the hypothesis that
RP may be caused by compression of the median nerve.
The surgical response of the patients who showed unilateral
involvement of the CTS and RP in both hands fails to
confirm this. Some patients with RP have improvement in
both hands, although only one hand was operated on, and
some showed no recovery at all. These findings suggest that
constitutional or systemic factors are also important.

If CTS and RP are not causally related, i.e., when the onset of RP precedes that of CTS, or RP occurs incidentally
with CTS, the results of carpal tunnel release are quite
different from those in this study. We attempted to dis-
tinguish between the onset of each condition in order to rule
out cases of superimposition, but in practice the patients
were not able to separate the date of onset of the two
conditions.

We have been encouraged that, in contrast to the double-
crush syndrome in which carpal tunnel release may have
less satisfactory results, we can expect a reasonable out-
come in patients suffering from both conditions (CTS and
RP) after simple decompressions of the carpal tunnel.

Our findings suggest that local compression of vaso-
motor fibres in the carpal tunnel can also be relieved by
release of the carpal tunnel. Careful consideration, how-
ever, is still required in treating patients with both condi-
tions since in some cases, RP may be superimposed or it
may be caused by other systemic conditions.

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