

Pianists with carpal tunnel syndrome: Conservative versus surgical treatment

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We studied retrospectively 18 patients, all professional pianists or advanced piano students, who had presented with carpal tunnel symptoms in the past and had undergone surgical or conservative treatments. We found that delayed diagnosis was more likely to lead to surgical treatment and that fear of diagnosis and fear of surgery prevented early treatment. Although surgical release was successful in 50% of the patients, re-education was essential to maintain good results according to long follow-up. Finally, medical practitioners are in a better position to help pianists when they make consideration of the demands and technical peculiarities of this profession.

Keywords: carpal tunnel syndrome; pianists' hand pain; pianists' finger numbness; pianists' finger weakness; nerve entrapment

Carpal tunnel syndrome is the most common cause of entrapment neuropathy in the upper limb. Compression of the median nerve within the carpal tunnel may be caused by an increase in the volume of its contents either due to local events such as tenosynovitis of the tendons within the tunnel or due to general disease such as diabetes, myxoedema, or rheumatoid arthritis. Compression of the median nerve gives rise to symptoms of numbness, pain, or weakness (clumsiness) in the affected hand. When a patient visits the medical practitioner complaining of symptoms suspicious of carpal tunnel syndrome, the clinical examination—comprising of specific diagnostic tests—may be able to confirm the condition and to some extent its severity. In cases of doubt, further electrophysiologic tests (electromyography and nerve conduction studies) may become necessary, where the prolongation of distal motor latency will confirm the presence of median nerve compression. It is,

however, worth mentioning that a normal result on electromyography does not rule out the diagnosis.

The treatment of carpal tunnel syndrome has been traditionally either conservative (rest, splints, oral or injectable anti-inflammatories), surgical (division of flexor retinaculum with or without neurolysis or tenosynovectomy), or both, depending on the severity of the symptoms. There is, however, a natural progression of the condition, with deterioration over time, and this becomes essential in the awareness that the patient should have in order to identify the early symptoms. Particularly for pianists—who are among the professionals more prone to develop carpal tunnel syndrome due to the repetitive tasks they perform—early diagnosis is crucial for the successful outcome of their treatment. In this study, we tried to detect how the time of diagnosis affected the treatment and outcome of carpal tunnel syndrome in the pianists studied. We also aimed to examine the progress of the condition in the pianists who received conservative treatment and the pianists who received surgical treatment. The surgeon-patient relationship was studied in an effort to establish potential correlation between the medical approach to the condition and the awareness of the particular technical issues of the pianist when making management decisions.

METHOD

Participants

Fifteen female and three male pianists, aged between 17–57 years, participated. They all studied or worked at the National Music Conservatory in Athens and their treatment—surgical or conservative—was also provided in Athens. The diagnosis had been made on the basis of clinical presentation, and on six patients, nerve conduction and electromyographic studies were also performed. Twelve patients had undergone surgical decompression and six had had non-surgical treatment with a combination of advice on modifying their practice, physiotherapy, splints, local anti-inflammatory injections, and oral anti-inflammatories.

Procedure

To assess the patients' follow up we distributed medical as well as practice questionnaires to collect information on pre- and post-treatment symptoms. In the pre-treatment period, the time of initiation of symptoms was studied in relation to the subsequent type of treatment and the relation of patterns and habits of practicing, as well as adverse psychology in relation to carpal tunnel

symptoms. In the post-treatment period (follow-up 4-14 years), the results of the pianists' progress were grouped into poor, good, and excellent according to specified criteria and assessed in relation to the treatment received.

RESULTS

In the pre-treatment period, our results showed that the early diagnosis was followed with relief of the symptoms without the need for surgery. Most delayed diagnoses were either due to fear of diagnosis or due to fear of potential surgical treatment (see Table 1). We found a correlation between symptomatology and technical difficulties in practice or occasions where low morale and social or career pressures were prominent (see Table 2).

In the post-treatment period, we defined our results according to the outlined criteria (poor: no change/possible deterioration, good: improvement/possible relapse, excellent: improvement/no relapse) for both conservatively and surgically treated pianists (see Table 3) and found that although surgical treatment had been of good initial relief in 50% of the patients, a further re-education of practicing was essential in order to maintain the outcome.

In the evaluation of this result, it is difficult accurately to detect retrospectively the surgeon/physician's familiarity/awareness with the particular technical issues that affect the pianists. In our questionnaire, we asked whether the patient felt that "the medical practitioner was able to discuss and understand the pianistic demands and peculiarities of their technique," and we based our results on their replies (see Table 4). It could be said that, the less aware the surgeon, the more his/her inclination toward surgical treatment.

DISCUSSION

Peripheral nerve entrapment syndromes of the upper extremities are well documented in musicians. Lederman (2004) evaluated 226 instrumentalists for playing-related disorders and found that 29% had a peripheral nerve disorder. Gohl *et al.* (2006) studied 19 pianists and concluded that 16% had early evidence of median neuropathy and that by completing a thorough medical history, good physical examination, and nerve conduction testing, early neuropathy may be detected.

In our present study, we found that the early diagnosis was followed with relief of the symptoms without the need for surgery. Most delayed diagnoses were either due to fear of diagnosis or due to fear of potential surgical treatment. It is essential that the pianists learn to identify early symptoms. During the early stages one can reflect upon the actual technique and postural ad-

Table 1. Pre-treatment period: time of diagnosis and subsequent treatment.

	<i>Diagnosis <3 months</i>	<i>Diagnosis 3-6 months</i>	<i>Diagnosis >6 months</i>
Conservative	1 (5.5%)	5 (27.7%)	0 (0.00%)
Surgical	2 (11.1%)	2 (11.1%)	8 (44.4%)
Fear of diagnosis	1 (5.5%)	2 (11.1%)	6 (33.3%)
Fear of surgery	2 (11.1%)	0 (0.00%)	7 (38.8%)

Table 2. Pre-treatment period: symptoms and associated circumstances.

	<i>Pain</i>	<i>Weakness</i>	<i>Paresthesiae</i>	<i>Other</i>	<i>Total</i>
No technical difficulties	2	2	2	1	7 (38.8%)
No adverse psychology	0	0	1	1	2 (11.1%)
No career pressures	1	1	1	0	3 (16.6%)
Technical difficulties	4	2	3	1	10 (55.5%)
Low morale	4	2	4	2	12 (66.6%)
Career pressures	4	3	4	4	15 (83.3%)

Table 3. Post-treatment period: outcome of treatment.

	<i>Poor</i>	<i>Good</i>	<i>Excellent</i>
Conservative	2 (33.3%)	2 (33.3%)	2 (33.3%)
Surgical	3 (25.0%)	6 (50.0%)	3 (25.0%)

Table 4. Post-treatment period: patient/surgeon relationship.

	<i>Surgeon aware</i>	<i>Surgeon unaware</i>
Conservative	3 (50%)	3 (50%)
Surgical	3 (35%)	9 (75%)

justments in order to reverse and further prevent compression of the median nerve in the carpal tunnel. Early signs should not be neglected by pianists as during these times one may not seek medical help; it relies on the musician to consider modification in their practice. If, however, symptoms and signs deteriorate, medical help should be sought without delay. Conservative treatment may come to benefit and treat the condition without need for surgery. It is also recognized that from some point onwards the damaged median nerve

will not recover with conservative means and surgery will become unavoidable.

We also found a correlation between symptomatology and technical difficulties in practice or occasions where low morale and social or career pressures were prominent. It has been discussed that misuse of the tendons and/or excessive wrist flexion are contributing factors to the development of carpal tunnel syndrome. It may also be the case that psychological matters that give rise to tension in the upper limbs play some role in this or other conditions that affect piano players. Further studies should be conducted to determine the statistical significance of the psychological effects.

We found that although surgical treatment had been of good initial relief in 50% of the patients, a further re-education of practicing was essential in order to maintain the outcome. This is either because the pianist had not modified their practice during the earlier stages of the condition or because the relief from the acute symptoms following surgery gave the freedom and reassurance to the pianist to practice without deliberating their technique. It is therefore essential for any re-education to happen soon after the operation and to be maintained during the rehabilitation period and beyond in order to prevent reoccurrence.

It could be said that, the less aware the surgeon, the more his/her inclination toward surgical treatment. This we cannot prove with this study, as due to its retrospective nature it cannot reflect accurate assumptions. However, we do take the opportunity to highlight this issue and emphasize that as the pianist needs to be aware of the early warnings of a possible carpal tunnel syndrome, the surgeon should be also aware of the possible technical aspects that can contribute to this condition and be in a position to discuss them with his patient before applying treatments.

We conclude that it is of major importance to maintain the clinician's awareness of the particular demands that the pianists have from their hands all the way through the diagnostic and treatment process. The debate of surgical versus conservative management still remains open, as there are cases that do equally well with either type of care. Carpal tunnel syndrome should be broadly made known to piano players, and the early clinical symptoms should be highlighted and possibly taught to the pianists early in their studies and careers. Whether the symptoms are due to wrong technical habits or whether they are due to unavoidable pathologies, it is crucial to understand that early diagnosis and management can relieve the pianist from the anxiety that carpal tunnel syndrome may cause.

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