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PERMANENCY OF RESULTS OBTAINED BY SYMPATHETIC SURGERY IN THE TREATMENT OF PHANTOM PAIN

BY

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Ever since 1937, when *Leriche* stated that it is possible to cause phantom limb pain and often the entire phantom to disappear by sympathetic surgery, the method has been used with increasing interest. Information concerning late results obtained by this method of treatment is, however, remarkably scanty.

The few reports which I have been able to find in the literature are rather varied. So far as I can find, the largest follow-up so far published has been *Wertheimer*'s. It included twenty-seven cases. Stellate infiltration in 3 cases gave a negative result in one, improvement in one and cure in one. Two stellectomies gave good results; in one of these the result was good "even after half a year". One stellectomy led to a thoracic sympathectomy, and the improvement was confirmed one and a half years later. Even after four years the result was fairly good in a case of peribrachial sympathectomy. Out of twelve cases of lumbar infiltration three gave negative results, seven improved slightly, and two led to a sympathectomy, with improvement of one. The results of perifemoral sympathectomy were good in two cases, even after 6-12 years. *White* had complete success in four out of eight cases, in which, it is true, the pain was localized in the stump, and in the remaining four the symptoms were alleviated, though only for a few months. In *Sicard*'s three cases the phantom pain recurred at latest a year after lumbar sympathectomy,

but *Leclerc* had five good results from sympathectomy even after 4-10 years, and a "lasting success" in four cases treated by infiltration. However, he also had two negative results, even though the sympathetic operation was combined with resection of the peripheral nerve. *Fontaine* and *Frank* reported twelve cases of phantom pain which, with one exception, had been operated on by Leriche 8-20 years ago; in all of them the immediate results were good, but in eight the pains returned gradually. These writers consider that sympathectomy early after the amputation would give better results.

Thus, the above survey shows only twenty-four cases (*Wertheimer, Leclerc, Sicard, Fontaine* and *Frank*) which have been followed for at least one year. This suggests that experience concerning the treatment of these conditions by sympathetic surgery is still far too limited to enable us to evaluate its practical importance.

In order to throw some light on this matter, I have followed up 68 cases. A questionnaire was sent to all disabled soldiers who had been treated for phantom pain by sympathetic surgery in our hospital between one and four years previously. The series included fifteen cases which were reported three years ago, when the follow-up period was only two to four months (*Ellonen*). In 65 cases the pain was located in the phantom limb, and in six of these it was felt simultaneously in the stump. In the remaining three cases the pain was felt only in the stump. In all cases where the upper limb was affected stellate infiltration was first attempted several times and sympathectomy was not performed if novocaine had no effect. In the beginning the same procedure was also used in cases where the lower limb was affected. In the upper limb cases, which were all operated upon by myself, a stellectomy of the classical type, with removal of the first thoracic ganglion, was performed, except in the first two operations, which were less radical. At lumbar sympathectomy usually the two lower lumbar ganglia were removed.

There were twenty upper limb cases; in fourteen the upper arm and in six the fore-arm was concerned. In thirteen the

treatment had no effect, not even temporarily. In one, the pain moved from the phantom limb to the stump. In four the relief of the phantom limb pain after sympathectomy lasted for only a few weeks, and in another case a good result after infiltration ended in recurrence after half a year. On the other hand, one patient reported three years after the operation that the phantom pain had continued to be milder, and one reports that he is still perfectly well. In this case a stellectomy had been done four years after the amputation. The pain as well as the phantom disappeared immediately after operation and are still absent after one and a half years. In this connection I should like to report another stellectomy with a successful result which I performed 6 months ago.

There were seventeen cases of thigh amputation. 16 suffered from phantom limb pain alone and one also from pain in the stump. Lumbar sympathectomy was done in fourteen cases. In six, of which three had only an infiltration, there was no improvement. In nine all pain, and in three also the whole phantom limb, disappeared after the operation, but the improvement lasted only 3-30 days. In some cases both the pain and the phantom disappeared for 18 months and then recurred in a still worse form. In two cases of phantom pain treated by sympathectomy the result was perfect three years and three months respectively after the operation: both pain and the phantom limb had disappeared, and this favourable result is still lasting after three years.

There were thirty cases of pain following below-knee amputations. The pain was located in the phantom in twenty-six, in the stump in two, and in both the phantom and the stump in two. Lumbar sympathectomy was done in twenty. In ten the operation did not even give passing relief; on the contrary, it made the pain worse. Previously, attempts had been made to treat the persistent pain by removing the neuroma; in one case the removal of the neuroma was, as recommended by *Fontaine,* performed at the same time as the sympathectomy. In ten cases the pain disappeared and even the phantom limb disappeared completely in three, and parti-

ally in another three. Unfortunately the condition recurred in five cases within 6 months and in three cases after 1-2 years. Only two said that they were completely cured, but not more than a year had elapsed since the operation. In addition, there was one patient who recovered after two novocaine infiltrations: the pain disappeared completely and left behind the phantom limb. This result, so easily obtained, has lasted for four years. This was the only positive result in ten cases treated by infiltration. There was one case of foot amputation, in which neither the pain in the stump nor that in the phantom foot improved after sympathectomy.

Thus in the majority of cases (39 out of 68) sympathetic surgery did not cause even temporary relief, and in one case it even made the pain worse. Yet the surgeon who treated these cases had at first favourable impression of the results because in a large proportion of the cases (29 out of 68) the immediate results were quite good. An adequate follow-up, however, was disillusioning: the successes proved to be only temporary (21 out of 29) and in most cases lasted only a very short time, usually six months or less (16 out of 21). In five cases the pain was absent for 1-2½ years. It is probable that even in the best cases of my series, i.e., where treatment resulted in complete cure, the end results will be less favourable than expected. Although in three of these patients the improvement has been maintained for 3-4 years, the observation time of the others has been only 1-1½ years. The fifteen cases of this series who were reported by *Ellonen* provide an excellent illustration of how easy it is to overestimate the value of sympathetic surgery in treatment of phantom pain when the observation time is too short. *Ellonen* stated after an observation time of 2-4 months that the pain had disappeared completely in seven and was relieved in two cases, but now only one of these patients is still satisfied with the result.

The results did not seem to depend on the length of the interval between amputation and sympathetic surgery, as maintained by *Fontaine* and *Frank*. The operation was com-

pletely successful in four cases treated as late as 3-5 years after the loss of the limb, while on the other hand, it was quite ineffective in some cases treated only one month after the amputation.

The sympathetic operations used may be discussed here. Though, in practice, stellectomy has been considered the method of choice, the anatomy suggests that removal of the second and third thoracic ganglia (*White*) might have given more positive results. Likewise, it might have been advisable to include higher lumbar ganglia at lumbar sympathectomy. However, though the number of each positive results might have been increased, it is doubtful whether there would have been any improvement in the end results. Besides, there is a great deal of evidence that in these cases success does not generally depend on the extent of the sympathetic resection (*Wertheimer, Leclerc, Fontaine* and *Frank*).

To sum up, I should like to say that, in the treatment of phantom limb pain, sympathetic surgery fails in a large proportion of cases to yield the desired result, and that in the numerous cases where the immediate result is favourable pain often recurs even as early as 1-4 years after the operation.

SUMMARY

The subject referred to in the title of this article has been little studied so far. The present writer followed up 68 cases, including 8 stellectomies, 34 lumbar sympathectomies, and 26 infiltrations. In the majority of the cases (39) sympathetic surgery was found to have no effect, and in one case it made the pain worse. In 29 cases the immediate results were good, but after 1-4 years only 6 patients reported that they were completely cured, and one said that the pain was less severe than before. The writer finds that the value of sympathetic surgery in the treatment of phantom limb pain has been overestimated.

RESUME

Le sujet indiqué par le titre de cet article a été très peu étudié jusqu'ici. L'auteur a suivi 68 cas, comprenant 8 stellectomies, 34 sympathectomies lombaires et 26 infiltrations. Dans la majorité des cas (39) la chirurgie sympathique n'a produit aucun effet et dans un cas les douleurs ont été même aggravées. Dans 29 cas les résultats immédiats ont été bons, mais au bout d'une durée variant entre 1 et 4 ans, 6 malades seulement ont été signalés comme entièrement guéris et l'un déclarait que les douleurs étaient moins fortes qu'auparavant. L'auteur trouve que la valeur de la chirurgie sympathique dans le traitement du fantôme douloureux a été surestimée.

ZUSAMMENFASSUNG

Der Frage, die in dieser Arbeit untersucht wurde, ist bisher wenig Aufmerksamkeit geschenkt worden. Der Verfasser hat 68 Fälle nachuntersucht, die 8 Ganglion stellatum Exstirpationen, 34 lumbale Sympatektomien und 26 Sympatikus Infiltrationen umfassen. In der Mehrheit der Fälle (39) war Sympatikus Chirurgie wirkungslos und in einem Fall nahmen die Schmerzen nach der Operation zu. In 29 Fällen war der unmittelbare Erfolg gut, aber nach 1—4 Jahren erwiesen sich nur 6 Patienten als vollständig geheilt, und ein Patient sagte, dass seine Schmerzen weniger ausgesprochen als vor der operation waren. Der Autor findet, dass der Wert der Sympatikus Chirurgie in der Behandlung von Phantomschmerzen der Extremiteten überschätzt worden ist.

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