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CERVICAL SYMPATHETIC BLOCKS IN THE TREATMENT OF BRACHIALGIA

By

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The brachialgia syndrome presents a varying picture as to type, localisation, severity and duration of the symptoms. The outstanding symptom occurring in all cases, and sometimes the only one to present itself, is pain centered in the shoulder girdle and its vicinity. In most cases the pains are confined to the area over the posterior and superior aspects of the shoulder joint, the lateral aspect of the upper arm, and the neck. The pain is of a persistent, nagging type. Radiating pain down the forearm and hand is common and in a few of these cases the pain has a distinct neuralgic character, extending over the distribution of one or more nerve roots. Pain may also radiate from the neck up to the occiput and even forwards to the precordium. In addition, numbness, paresthesias, local tenderness and a sensation of cold may be present in various parts of the arm. Patients may also complain of headache, often one-sided, and nervous symptoms in the form of anxiety feelings and insomnia. The objective symptoms are as a rule slight. Only in a few patients with distinct pains of rhizopathic character can neurologic degenerative symptoms in the form of sensory and motor disturbances and paresis be shown to exist. In many cases a slight to moderate decrease in shoulder joint mobility may be found. Occasionally one encounters a diffuse swelling of hand and fingers together with tenderness and reduced mobility.

The clinical course may vary from the occasional, quickly subsiding attack to more or less regularly recurring painful periods and finally to a chronic painful condition that may totally disable the patient for years. Neither are severity and type of pain reliable criteria for an accurate prognosis in the individual case.

Although the etiology of the syndrome is still a controversial matter, most cases of brachialgia are thought to be of radicular origin. Great importance has been attached to narrowing of the intervertebral foramina as a result of degenerative changes in the cervical spine. Evidence of this phenomenon can often be found by roentgenography. On the other hand it has been established that a narrowed foramen often does not at all impair the normal function of the nerve root. Consequently it has been assumed that a traumatic or inflammatory process causing edema and stasis which further encroach on the space in the foramen must be partly responsible for the onset of the symptoms. A similar role may be attributed to tissue reactions near a disc affected by degenerative changes. The root-sleeve fibroses described by Frykholm, the equivalent of which are hardly to be found anywhere else in the spine, are of the same type.

There is no complete agreement as to significance and frequency of cervical disc protrusions, but they are probably the main factor underlying the small group of cases with distinct neuralgias and neurologic degenerative symptoms.

Vasomotor disturbances, notably redness, cyanosis, peripheral coldness, edema and skin atrophy have to some extent been observed in connection with brachialgia. In cases where reduced mobility of the shoulder joint is a feature, the picture merges into that of the "shoulder-hand syndrome" and other so-called reflex dystrophies in the arm.

This has directed attention to the role of the autonomic nervous system. Even if opinion is still divided about the occurrence of sympathetic fibres in the cervical roots, it is clear that the autonomic nervous system in the cervical spine is highly developed in comparison to the lumbar region.

The intervertebral canals and the region of the vertebral artery are abundantly supplied with sympathetic fibres which can be affected in the same way and to the same degree as the motor and sensory pathways. One might furthermore consider the possibility of an autonomic irritation resulting from a prolonged painful condition evoked by other factors. These observations have suggested that by treatment directed at the cervical sympathetics, and notably their central "switchboard", the stellate ganglion, it may be possible either to disrupt the transmission of painful stimuli along the autonomic pathways or to reduce the excessive irritability that may conceivably be present. Leriche recommended blocking the stellate ganglion by local anesthesia and this procedure has been adopted by Reischauer, among others. The paralysis

of the sympathetics achieved by this method is only of a temporary nature and in cases where this has proved to give insufficient relief, surgical sympathectomy and extirpation of the stellate ganglion have been adopted.

Although no definite statistical proof is available, there is no doubt that the incidence of brachialgia cases has increased in the last decade. If it is true that the autonomic nervous system is involved in producing the pain, it is conceivable that we are here confronted with another of the stress symptoms that have become increasingly common in other organic systems.

At the orthopaedic cinic of Uppsala we have through analysis of a number of brachialgia cases attempted to evaluate the effectiveness of cervical sympathetic blocks in this condition. Table I gives the data relevant to the cases studied:

Age	21–30	31–40	41–50	51–60	61–70	71–80	
Men		2	11	9	5	2	= 29
Women	2	13	7	7	2		= 31

Highly characteristic of the material was that the condition in all cases except three, where symptoms had been present for less than three months, had been of long standing. In 50 % symptoms had persisted for three years or longer and the patients had undergone therapy several times in the form of traction, roentgen treatment, physical therapy or ultrasonic therapy. In one case partial fusion of the cervical spine had been performed without effect on the pain. Roentgenographic changes in the cervical spine with decreased disc space height, sometimes in connection with reactive sclerosis, were found in 24 of the 29 men and 18 of the 31 women. The same frequency might be expected for an identical number of cases without any symptoms suggestive of brachialgia selected at random from among the same age groups.

TECHNIQUE

Injections were made partly by the medial approach with the needle inserted immediately laterally to the trachea but medially to the vessels, partly by the lateral approach with the site of injection behind the lateral aspect of the sternocleido muscle and the needle directed diagonally, medially, and dorsally. Injection was made two fingerbreadths over the clavicle. The needlepoint was then retracted some millimeters

and the site was aspirated to ascertain that the needle had not penetrated into a vessel or into the subarachnoid space. After that 10–15cc. of 1 % xylocain-adrenalin solution was injected.

Only if a complete Horner syndrome appeared within a few minutes of the injection was the treatment regarded as technically satisfactory. In most cases a pronounced rise in the temperature of the arm became evident while some effect on the brachial plexus with fairly pronounced paresis was not unusual.

The procedure is a technically simple one and can, if the injection is made with the patient lying down, be facilitated by turning the head in the opposite direction and placing a pillow under the upper part of the thoracic spine. The depth of the injection then is considerably less and orientation is easier. When injection is made by the medial approach it is often preferable to have the patient sit up.

Some literature is available on grave complications arising from perforation of the pleural sac or the subarachnoid space. A 2–4 % pneumothorax incidence has been mentioned. Intravascular injection is not considered to be free from danger in all cases.

In the present series none of these complications arose. Some of the patients complained immediately after the injection of an excruciating one-sided headache so distressing that the treatment had to be stopped. On an average each patient in the group was given three injections.

RESULTS

Lack of objectively recordable symptoms made the patients' own appraisal of the degree to which pain was relieved the only criterium for the success of the treatment. To be acceptable as a result of the injection and not as due to spontaneous recovery, any such alleviation of pain had to occur immediately after injection had been made. Another condition for the therapeutic effect to be considered satisfactory and the patient classified as recovered was that relief of pain should last for a sufficiently long period. Four months was decided upon as the minimum limit. The patients were therefore asked to give their opinion as to the effect of the injections on the pain both at the time of the treatment and at least four months after treatment had been concluded. Results are shown in table II:

	Complete relief	Marked improvement	No improvement
Men	5	6	18
Women	6	9	16

The above-mentioned requirements for a positive and satisfactory effect on the brachialgic pains were met in 40 %. Results appeared to be more favorable in cases where the condition had been present for a somewhat shorter time. Temporary relief following the injection, with pains recurring within a few days, could be recorded in 16 cases. Consequently, brachialgic pains could be relieved temporarily or more lastingly by a cervical block in a total of 70 %.

Five more patients showed improvement during the observation period, but as this occurred two weeks or longer after the injection series had been concluded, we could not be sure that it had any connection with the treatment.

DISCUSSION

The purpose of this investigation was to determine whether brachialgic pains could at all be affected by sympathetic blocks. Evaluation of the effect is hampered by the periodicity of the condition and its tendency to spontaneous recovery. The figures given above must therefore be judged with caution. Still, it should be stressed that in practically all cases of recovery the patients' symptoms had persisted over a number of years and had defied all earlier attempts at therapy. The significance of this treatment for the results obtained can therefore hardly be denied. In other investigations the incidence of recovered and improved patients has been considerably higher and figures of up to 75 % have been shown. However, no information is available on the type of cases in those groups and it is possible that they concern conditions of shorter standing which would not only respond more readily to treatment but also have a stronger tendency towards spontaneous recovery.

It is our opinion that the cervical sympathetic block is a technically simple and a safe method of treatment, effective to a sufficiently great extent to be considered a valuable alternative in the treatment of painful conditions in the shoulder girdle and arm.

SUMMARY

A short account is given of the theories underlying the adoption of cervical sympathetic blocks in the treatment of painful syndromes in the shoulder girdle and arm, so-called brachialgias. Results obtained in the treatment of 60 patients with persistent symptoms of several years

standing are reviewed. In 70 % of the cases pain was alleviated as a result of the injections and in 40 % relief of pain lasted at least four months. The method is considered a useful alternative in the treatment of this condition.

RESUME

Il est donné un compte rendu sommaire des théories appuyant l'adoption du blocage sympathique cervical dans le traitement de syndromes douloureux des épaules, de la taille et du bras, appelés brachialgies. Les résultats obtenus dans le traitement de 60 malades dont les symptômes avaient persisté plusieurs années sont examinés. Dans 70 % des cas, les douleurs ont été soulagées par les injections et dans 40 % le malade a été soulagé pour une période d'au moins quatre mois. Cette méthode est considérée comme une alternative utile dans le traitement de tels cas.

ZUSAMMENFASSUNG

Ein kurzer Bericht über die Theorien, die der Verwendung des cervikalen Sympatikus Blocks in der Behandlung des schmerzvollen Syndroms des Schultergürtels und 9rmes, der sogenannten Brachialgie, zugrunde liegen, wird gegeben.

Die Ergebnisse der Behandlung von 60 Patienten mit konstanten mehrjährigen Symptomen werden überprüft. In 70 % der Fälle waren die Schmerzen gemildert als eine Folge der Injektionen und in 40 % dauerte die schmerzstillende Wirkung zumindest 4 Monate. Die Methode wird als eine nützliche Möglichkeit in der Behandlung dieses Zustandes betrachtet.

LITERATURE

1. *Frykholm, R.:* Cervical Nerve Root Compression Resulting from Disc Degeneration and Root-Sleeve Fibrosis. Acta Chir. Scand. Suppl. 160, 1951.
2. *Hardt, H. O.:* Zur Entstehung und Behandlung des Zervicalen Vertebralsyndrom. Deutsche Medizinische Wochenschrift. 81: 2061–65, 1956.
3. *Reischauer, F.:* Die Zervikalen Vertebralsyndrome. Stuttgart, 1955.
4. *Walls, W. K. J.:* The anatomical approach in stellate ganglion injection. British Journal of Anaesthesia. 27: 616–621, 1955.