The Effect of Stellate Ganglion Block on Intractable Lymphedema after Breast Cancer Surgery

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Lymphedema of the upper limb after breast cancer surgery is a disease that carries a life-long risk and is difficult to cure once it occurs despite the various treatments which have been developed. Two patients were referred from general surgery department for intractable lymphedema. They were treated with stellate ganglion blocks (SGBs), and the circumferences of the mid-point of their each upper and lower arms were measured on every visit to the pain clinic. A decrease of the circumference in each patient was observed starting after the second injection. A series of blocks were established to maintain a prolonged effect. Both patients were satisfied with less swelling and pain. This case demonstrates the benefits of an SGB for intractable upper limb lymphedema.

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Key Words: Autonomic nerve block; Breast cancer; Lymphedema; Mastectomy; Nerve block; Stellate ganglion.

Despite the decline in the incidence of lymphedema and the various treatments available to treat it, patients with lymphedema have a life-long risk and are nearly incurable once it occurs, making them vulnerable to numerous symptoms of lymphedema, such as chronic pain, heaviness, numbness and physically impaired arm function with a limited range of motion [1]. The consequences include a decreased quality of life, social activities and self-confidence, leading to negative emotions such as anxiety, frustration, sadness, anger and increased self-consciousness.

We hereby report two patients treated with stellate ganglion blocks (SGBs) for the treatment and maintenance of intractable lymphedema following by breast cancer surgery.

CASE REPORT

1. Case 1
The patient was a 59-year-old woman with right arm edema who had had a right breast wide excision with axillary lymph node dissection two years earlier. She had been visiting rehabilitation department for the previous two years to treat right arm edema, with medications and physical therapy such as compression bandages, without improvement. On the day of her first visit, the circumference...
ferences around the middle portion of her upper and lower arm were 32 and 28 cm, respectively. A right SGB was done with 5 ml of 0.5% mepivacaine by palpating the anterior transverse process from the C6 vertebra. During a follow-up four days later, her arm measured 31 and 27 cm respectively, but she did not feel much improvement. On the same day, a second block was done, and the corresponding circumferences decreased to 30 and 26.5 cm four days later with a markedly improved feeling of softness. The process was repeated after four days, seven days and then three times with a two-week interval, with corresponding results of 30 and 26.5 cm, 31 and 27 cm, 31 and 25 cm, and 30.5 and 25 cm. The difference in the interval period was due to the patient’s request for an earlier follow-up. Throughout the follow-up period, she expressed softness and was relieved from the sensation of edema.

2. Case 2

The patient was a 46-year-old woman who had right breast skin-sparing mastectomy with axillary lymph node dissection three months prior to reporting any pain. She was complaining of pain and edema in her right shoulder and arm. Under the impression of lymphedema with a frozen shoulder, an SGB with 0.5% mepivacaine and a suprascapular nerve block with a 10 ml mixture of 0.18% ropivacaine and 5 mg of triamcinolone were done. Upon a follow-up two weeks later, the circumference was reduced from 35 and 24 cm to 32.3 and 24 cm. The procedure was repeated for the next four consecutive weeks with the corresponding results being 32.3 and 25 cm, 33 and 23 cm, and 33 and 24.5 cm.

DISCUSSION

Several mechanisms are known to be related to the development of lymphedema. These include blockage of the lymphatic flow due to lymph node dissection, venous blockage due to strangulation, and thrombotic vasculitis or fibrosis combined with radiation therapy [2].

Although the incidence of intractable lymphedema after breast cancer surgery varies depending on its definition, it has substantially decreased over the past decades from 27% [3] to 16.6% [4], with the help of earlier diagnoses and advanced surgical operations, such as sentinel lymph node biopsy, and the avoidance of unnecessary axillary lymph node dissection [5].

However, Ahmed et al. [6] found that only 40% of breast cancer survivors with arm symptoms but not diagnosed with lymphedema had previously heard of lymphedema, and less than 2% of them had received any treatment. This indicates that many patients lack information about lymphedema.

There have also been more studies of conservative treatments such as complex physical therapy, manual lymphatic drainage, the use of pneumatic pumps, oral pharmaceuticals, low-level laser therapy, compression bandaging and garments, limb exercises and elevation, but the long-term benefits of these treatments remain controversial [7,8]. Surgical options are also available such as vascularized lymph node transfer, lymphaticovenous anastomosis and suction-assisted protein lipectomy, but these cannot be a complete solution considering their controversial outcomes, their invasive characteristics, and need for additional operations under general anesthesia [9].

From these two patients, we could observe an improvement of lymphatic drainage after a series of SGBs. The therapeutic use of an SGB for the treatment of lymphedema was introduced by Swedborg et al. [10] considering the theory that the block itself interferes with the sympathetic nervous system and thus relaxes the veins, thereby reducing the post-capillary resistance such that the accumulated interstitial fluid is released into the venous system [11]. A sympathetic ganglion block of the lumbar region has also been used in the same manner for the treatment of lower limb lymphedema after gynecologic cancer surgery [11]. A thoracic sympathetic ganglion block is an alternative procedure which uses a mechanism identical to that used in SGB, but because lymphedema requires a repeated process, an SGB offers more benefits than a thoracic sympathetic ganglion block, for several reasons. First, an SGB can be done more easily with or without the help of ultrasonographic guidance. A thoracic sympathetic ganglion block requires fluoroscopic guidance, which increases the degree of radiation exposure after the repeated process. Second, a thoracic sympathetic ganglion block introduces greater risks regarding major organs in the chest such as the lungs, heart, aorta and vena cava.

An SGB is also known to affect the immune system of the arm [12] and raise the skin temperature [13,14], resulting in a reduction of swelling and with the process
being similar to that of regional heat therapy. This leads to the near resolution of perivascular cellular infiltration, the disappearance of the lymph lakes, and the dilatation of capillaries [11]. From a psychosocial point of view, an SGB will improve the symptoms of lymphedema and thereby will eventually will lead to an improvement in the quality of life and the social activities of affected women thus affected while also reducing their psychological distress [6].

Therefore, we should educate breast cancer surgery patients and monitor them for with lymphedema more closely from an earlier stage to be able to provide better outcome through the active use of SGBs.

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