KJP The Korean Journal of Pain
| Brief Report |
Korean J Pain 2015 January; Vol. 28, No. 1: 61-63
pISSN 2005-9159 eISSN 2093-0569
http://dx.doi.org/10.3344/kjp.2015.28.1.61

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

Department of Anesthesiology and Pain Medicine, School of Medicine, Ewha Womans University, Seoul, Korea

Jin Kim, Hahck Soo Park, Soo Young Cho, Hee Jung Baik, and Jong Hak Kim

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. (Korean J Pain 2015; 28: 61-63)

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 circum-

Received November 26, 2014. Revised December 9, 2014. Accepted December 10, 2014.
Correspondence to: Hahck Soo Park
Department of Anesthesiology and Pain Medicine, School of Medicine, Ewha Womans University, 911-1, Mok-5-dong, Yangcheon-gu, Seoul 158-710, Korea
Tel: +82-2-2650-2688, Fax: +82-2-2655-2924, E-mail: ingoo97@lycos.co.kr

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 each 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.

REFERENCES

1. Smoot B, Wong J, Cooper B, Wanek L, Topp K, Byl N, et al. Upper extremity impairments in women with or without lymphedema following breast cancer treatment. J Cancer Surviv 2010; 4: 167–78.
2. Kim HG, Kim K, Seo HG, Im CY, Kim TU, Chung SG, et al. Clinical outcomes of cervical stellate ganglion block in patients with secondary lymphedema: a pilot study. J Korean Acad Rehabil Med 2009; 33: 297–303.
3. Hinrichs CS, Watroba NL, Rezaishiraz H, Giese W, Hurd T, Fassl KA, et al. Lymphedema secondary to postmastectomy radiation: incidence and risk factors. Ann Surg Oncol 2004; 11: 573–80.
4. DiSipio T, Rye S, Newman B, Hayes S. Incidence of unilateral arm lymphoedema after breast cancer: a systematic review and meta-analysis. Lancet Oncol 2013; 14: 500–15.
5. McLaughlin SA, Wright MJ, Morris KT, Giron GL, Sampson MR, Brockway JP, et al. Prevalence of lymphedema in women with breast cancer 5 years after sentinel lymph node biopsy or axillary dissection: objective measurements. J Clin Oncol 2008; 26: 5213–9.
6. Ahmed RL, Prizment A, Lazovich D, Schmitz KH, Folsom AR. Lymphedema and quality of life in breast cancer survivors: the Iowa Women's Health Study. J Clin Oncol 2008; 26: 5689–96.
7. Moseley AL, Carati CJ, Piller NB. A systematic review of common conservative therapies for arm lymphoedema secondary to breast cancer treatment. Ann Oncol 2007; 18: 639–46.
8. Ancukiewicz M, Miller CL, Skolny MN, O'Toole J, Warren LE, Jammallo LS, et al. Comparison of relative versus absolute arm size change as criteria for quantifying breast cancer-related lymphedema: the flaws in current studies and need for universal methodology. Breast Cancer Res Treat 2012; 135: 145–52.
9. Granzow JW, Soderberg JM, Kaji AH, Dauphine C. An effective system of surgical treatment of lymphedema. Ann Surg Oncol 2014; 21: 1189–94.
10. Swedborg I, Arnér S, Meyerson BA. New approaches to sympathetic blocks as treatment of postmastectomy lymphedema. Report of a successful case. Lymphology 1983; 16: 157–63.
11. Woo JH, Park HS, Kim SC, Kim YH. The effect of lumbar sympathetic ganglion block on gynecologic cancer-related lymphedema. Pain Physician 2013; 16: 345–52.
12. Yokoyama M, Nakatsuka H, Itano Y, Hirakawa M. Stellate ganglion block modifies the distribution of lymphocyte subsets and natural-killer cell activity. Anesthesiology 2000; 92: 109–15.
13. Kim SH, Kim KN, Lee DG, Chae WS, Kim YI. Follow-up evaluation of the effect of stellate ganglion block using thermography. Korean J Pain 2006; 19: 115–8.
14. Park YJ, Woo NS, Lee YC. Thermographic follow-up of the stellate ganglion block. Korean J Pain 1994; 7: 258–62.