

Sympathectomy for Lymphedema: A Case Series

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Abstract

Breast cancer-related lymphedema (BCRL) is an increasingly common complication seen in the palliative care setting due to increased life expectancy of breast cancer survivors. It is an important determinant of the quality of life of breast cancer survivors, due to the functional impact that it has, apart from the pain and deformity associated with it. Conservative management of lymphedema with the help of physiotherapy, positioning, manual lymphatic drainage, and intermittent pneumatic compression is well known. Even then, there remains a subset of patients that fail to respond to conservative management. T2 sympathectomy is a technique which ablates the thoracic sympathetic chain and helps in improving the lymphatic drainage. We report a series of four cases of BCRL, which showed a significant reduction in the mid-arm circumference as well as pain scores after a T2 sympathectomy. We believe that T2 sympathectomy can be used as the second line of management in lymphedema patients in whom conservative treatment has failed.

Keywords: Breast cancer-related lymphedema, lymphedema, sympathectomy, T2 sympathectomy

BACKGROUND

Breast cancer is the most common cancer in Indian women.^[1] Due to advancements in medical science, the number of patients getting good-quality treatment has drastically increased in the last few decades. Thus, long-term complications of treatment are coming into focus as they are the major determinants of the quality of life of the survivors.^[2] Breast cancer-related lymphedema (BCRL) is an important long-term complication of breast cancer treatment, risk factors of which include axillary lymph node dissection and regional lymph node radiation. It occurs due to damage to the lymphatic vessels during surgery or radiotherapy, which results in extravasation and accumulation of the protein-rich lymphatic fluid in the interstitial space of the arm, neck, and upper back. It is one of the most common long-term complications of breast cancer treatment and affects almost 20% of the patients who have been treated for breast cancer.^[3] It has not only cosmetic implications but may also cause pain and limit the mobility of the affected limb, ultimately leading to a reduced quality of life.

BCRL treatment focuses on reducing the circumference and tissue volume of the affected arm, reducing pain and discomfort, and enhancing the quality of life. Conventional treatment options include decongestive physiotherapy, manual lymphatic drainage, compression bandaging and garments,

and benzopyrone administration. BCRL is a chronic and intractable condition, and is not typically cured by conservative modalities. Thoracic sympathetic ganglion block (TSGB) increases perfusion and reduces edema through vasodilation. Identification of a clinically significant effect of TSGB in lymphedema may indicate its potential as a treatment option.

We report a series of four cases of BCRL, in which we performed T2 sympathectomy, resulting in a significant reduction in the arm circumference as well as the pain related to the BCRL.

CASE REPORTS

Case 1

A 38-year-old woman post left-sided modified radical mastectomy and chemotherapy, with BCRL Stage 2, came to us after undergoing physiotherapy for her lymphedema for almost 3–4 months. She was referred to us as there was

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a progressive increase in her arm circumference despite conservative management.

Case 2

A 67-year-old nurse who had undergone treatment for breast cancer, including chemotherapy and surgery 6 years ago, came to us with right-sided Stage 2 lymphedema. Being in the medical profession, she was regularly monitoring her arm circumference and was piously doing the exercises that she was advised after the surgery. However, for 2 months, she was feeling heaviness and pain in her arm.

Case 3

A 54-year-old woman with BCRL Stage 3 was referred to us by her family physician. She was 2 years postsurgery, and had progressive lymphedema, tingling, and pain in her left upper limb.

Case 4

A 52-year-old woman presented with Stage 3 BCRL 4 years after surgery and radiotherapy. She had severe shooting pain in her right arm and hand.

All the four cases underwent T2 sympathectomy in the operation theater, with routine hemodynamic monitoring, under fluoroscopic guidance. After fluoroscopic confirmation of the needle position and ruling out intravascular, intrathecal, intrapleural, or epidural spread, T2 sympathectomy was performed by two lesions of conventional radiofrequency ablation with a 22G needle, 10-mm active tip at 80° for 90 s. This was followed by injection triamcinolone 40 mg + 4 ml 0.5% bupivacaine to avoid postablation neuritis. The patient was observed in the day-care unit for 6 h after the procedure. The mid-arm circumference and pain score were noted prior to the procedure. The pain score was monitored immediately after the procedure and at discharge. The mid-arm circumference was then monitored 2 weeks and 2 months after the procedure.

RESULTS

All the four patients showed a significant difference in the mid-arm circumference 2 weeks after the procedure, which remained sustained until the 2-month follow-up [Table 1]. We also observed better pain relief after the procedure with a dramatic reduction in the tingling and numbness.

DISCUSSION

Lymphedema is classified into four stages: Stage 0 indicates a clinically normal extremity with abnormal lymph transport;

Stage 1 is early edema, which improves with limb elevation; Stage 2 consists of pitting edema that is not resolved on limb elevation; and Stage 3 describes fibroadipose deposition and skin changes.^[4] Sympathectomy is thought to be effective in lymphedema by promoting dilatation of the precollector vessels. It also improves local vasodilation, thus reducing the load on the lymphatic system. Furthermore, there is believed to be a direct relation between the sympathetic and lymphatic systems, or the sympatho-afferent coupling, which may also contribute to the pain relief.^[5]

All these factors may have played an important role in the improvement in the arm circumference and pain score.

The hemodynamic mechanisms underlying the clinical effects of sympathetic blockade in BCRL patients include the relationship between the lymphatic and vascular system and the sympathetic nervous system. The lymphatic system comprises deep and superficial lymphatic channels. The superficial lymphatic system within the skin includes the small lymphatic capillaries and serves as the primary drainage route. The deep lymphatic system, with its larger precollector vessels, collects and discharges waste debris and fluid from the superficial lymphatic system into the systemic circulation.^[6] TSGB is thought to promote dilation of precollector vessels, which increases the drainage of excess fluids into the systemic circulation.

In BCRL patients, often, there is excessive interstitial fluid, and the small lymphatic capillaries enlarge to increase drainage, with the sympathetic response maintained throughout.^[7] Over time, the resistance of the lymphatic capillaries gradually decreases, which decreases skin elasticity and worsens lymphedema.

There also may be a direct interaction between the sympathetic and lymphatic systems. Sympatho-afferent coupling is a known contributor in the pathophysiology of complex regional pain syndrome, which also responds to TSGB.^[8] It involves activation of the sympathetic nervous system, which causes injury to the nociceptive nervous system. The sympathetic nervous system is also thought to directly regulate lymphatic flow.

This was a case series which needs to be followed up by a larger randomized control trial to know the exact efficacy of the treatment. Furthermore, we could have used other comprehensive scales such as the Lymphedema Breast Cancer Questionnaire which would have improved the results. However, the results of this series are encouraging for this very common condition of lymphedema, which we hope will play a major role in the improvement of the quality of life of a large number of patients.

Table 1: Effect of T2 sympathectomy on the mid-arm circumference and visual analog scale score

Stage of lymphedema	Mid-arm circumference - Baseline (cm)	VAS score - baseline	Mid-arm circumference - 2 weeks	VAS score - 2 weeks	Mid-arm circumference - 2 months	VAS score - 2 months
2	38	6	36	2	35	2
2	37	7	34	3	35	2
3	42	6	36	2	35	3
3	38	7	32	4	31	3

VAS: Visual analog scale

CONCLUSION

T2 sympathectomy may reduce the arm circumference in BCRL. It should be considered the second-line treatment in patients who do not respond to, or worsen in spite of conservative treatment.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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