

Secondary lymphedema after high ligation of the great saphenous vein surgery

A case report

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Abstract

A 56-year-old male patient with secondary lymphedema in a single lower extremity presented to our hospital.

He received high ligation of great saphenous vein 3 years ago. Severe infection was observed in affected limb on postoperative day 10, and rapidly progressive pain and erythema spreading to inguinal region. He was diagnosed with secondary lymphedema after 3 years of high ligation of great saphenous vein. Compression treatment was given in affected limb to promote the lymphatic return.

The patient was followed up for 3 months now, the edema in right leg showed attenuation compared with before.

Keywords: great saphenous vein, high ligation, lymphedema, surgery

1. Introduction

Lymphedema is featured by abnormal accumulation of macromolecules in the interstitial space.^[1] Many patients present limb enlargement due to lymphatic fluid deposition.^[2] High ligation of the great saphenous vein has been commonly used for treating lower extremity varicosities. The postoperative complications included infection, injury of saphenous nerve, deep venous thrombosis, and pulmonary embolism. In this case, we present a patient who showed secondary lymphedema after high ligation of great saphenous vein.

2. Report

A 56-year-old male patient presented to our hospital with a 3-year history of secondary lymphedema in a single lower limb in April 2017. On physical examination, skin color of the right leg

was in a slightly red color, with slightly high temperature in local region. The circumference was about 2.5 cm longer than that of the left leg in affected area. Swelling was noticed in the right inguinal lymph nodes. Written informed consent was obtained from the patient. The study protocols were approved by the Ethical Committee of the Yantai Vocational College.

Three years ago, he received high ligation of the great saphenous vein, and severe infection was observed in the affected limb after surgery. Bacterial culture based on the dermatic secretion from the affected limb indicated acute lymphangitis, and antibiotic treatment was given using penicillin G (*Streptococcus* positive). Later, the erythema showed attenuation. He had ipsilateral lymphedema after treatment.

The patient was initially followed up after discharge, and he reported light edema in the operated shank and feet. In the recent follow up (3 years after discharge), aggravation was noticed in the edema in affected limb (Fig. 1). Then he was diagnosed with secondary lymphedema after high ligation of the great saphenous vein. Compression treatment by using 20–30 light stroking movements per minute in the edema region was used to stimulate the lymphatic backflow.

In the 3-month follow-up, edema in the right leg showed attenuation, and the circumference showed obvious decrease (about 1.5 cm) compared with before. In addition, the lymphatic edema showed decrease. No recurrence or progression of edema was observed in the right lower limb.

3. Discussion

There are many complications after varicose veins surgery, including deep venous thrombosis, haematomata, and saphenous nerve lesion.^[3] Secondary lymphedema is rarely reported and the pathogenesis is still unclear. There are many lymph vessels and nodes distributing along the great saphenous vein, especially the position near inguinal region. These lymph vessels are distributed along with the great saphenous vein within the crural portion, and finally reached the inguinal region. Thus, surgery for the varicose veins extraction may trigger injury of the lymph vessels. This will foster iatrogenic injuries in the higher risk zones, and finally may lead to secondary lymphedema. The

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What unique educational message is provided and why is it relevant?

Secondary lymphedema is a rare condition after high ligation of the great saphenous vein. The appropriate treatment involves careful dissection and minimizing the injury to the surrounding tissues.

Ethics approval and consent to participate: The study protocols were approved by the Ethical Committee of the Yantai Vocational College. The authors declare that they have no competing interests.

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Figure 1. A 56-year-old male patient showed significant swelling in the circumference in the right lower limb. He was diagnosed with secondary lymphedema after high ligation of the great saphenous vein.

lymph flow is based on load and clearance. Perhaps, the male may present hypoplasia of lymphatic vessels after birth. At first, he showed no lymphedema symptoms at the early age due to compensation. In cases of lymphatic vessel injuries after surgery, disruption in the compensation of the lymphatic vessels may occur.

In this case, the secondary lymphedema may be associated with lymphangitis in lower limb as he showed serious erysipelas in his affected limb. It may result in injury of more lymphic vessels. In the follow-up, the patient had been suffering from continuous potential infection in his affected limb because of stubborn tinea pedis. All these factors caused lymphokinesis decompensation.

High ligation of the great saphenous vein may induce several intra- and post-surgical complications.^[4,5] Secondary lymphedema is a rare visible complication following varicose veins surgery. There is no such case of secondary lymphedema after high ligation of the great saphenous vein after a comprehensive literature research using the following keywords of “saphenous vein stripping”, “postoperative”, “complication”, “lymphedema”. “saphenous” and “limb” from the MedLine, PubMed, and Embase databases. We only identified one study reporting a case with secondary malignancy saphenous venectomy rather than lymphedema.^[6] We firstly reported a patient with secondary lymphedema after high ligation of the great saphenous vein and

summarized our clinical experiences. On one hand, special cares should be given to avoid lymphic vessel injuries during vein resection. Upon dissociation of the great saphenous vein and the varicose veins, we should be cautious to decrease the potential injury to surrounding tissues. On the other hand, we should recognize the possible anomalies in the common anatomical passage of the lymphic vessels and lymph nodes during varicose veins extraction, in order to prevent iatrogenic injuries within higher risk zones.

4. Conclusion

Secondary lymphedema is a rare condition after high ligation of the great saphenous vein. The appropriate treatment involves careful dissection and minimizing the injury to the surrounding tissues.

Author contributions

PC wrote the manuscript; HC revised the manuscript; XW did the data analysis.

Data curation: Xuan Wang.

Funding acquisition: Mu Yang.

Investigation: Mu Yang.

Methodology: Mu Yang.

Software: Xuan Wang.

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Writing – review & editing: Hui Chen.

References

- [1] Lee B, Andrade M, Bergan J, et al. Diagnosis and treatment of primary lymphedema. Consensus document of the International Union of Phlebology (IUP)-2009. *Int Angiol J Int Union Angiol* 2010;28:454–70.
- [2] Schook CC, Mulliken JB, Fishman SJ, et al. Primary lymphedema: clinical features and management in 138 pediatric patients. *Plast Reconstr Surg* 2011;127:2419–31.
- [3] Uhl JF, Gillot C. Anatomy and embryology of the small saphenous vein: nerve relationships and implications for treatment. *Phlebology* 2013;28:4–15.
- [4] Lacroix H, Nevelsteen A, Suy R. Invaginating versus classic stripping of the long saphenous vein. A randomized prospective study. *Acta Chirur Belg* 1999;99:22–5.
- [5] Goren G, Yellin AE. Minimally invasive surgery for primary varicose veins: limited invaginated axial stripping and tributary (hook) stab avulsion. *Ann Vasc Surg* 1995;9:401–14.
- [6] Baroni A, Russo T, Piccolo V, et al. Opportunistic metastatic porocarcinoma after saphenous venectomy for coronary bypass surgery. *Clin Exp Dermatol* 2013;38:507–10.