

Causes and Treatment of Inguinal Lymphadenopathy: Literature Review

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Abstract

Objective. To summarize the causes and treatment of inguinal lymphatic leakage, and to provide references for clinical treatment of inguinal lymphatic leakage. **Methods.** The literatures on the inguinal lymphatic leakage in recent years were reviewed. The main research contents and results of each literature were summarized, and the causes and treatment progress were summarized. **Results.** There is no uniform standard for the diagnosis of inguinal lymphadenopathy and there are no standardized guidelines for treatment, but there are many reported treatments. **Conclusion.** The occurrence of lymph leak in the groin area is inevitable, and attention must be paid to prevention. The treatment is difficult, and both the doctor and the patient must be fully prepared before surgery. Treatment should be proactive, flexible selection according to the situation, and a combination of multiple treatment methods can achieve better treatment results.

Keywords

Inguinal Region, Lymphatic Leak, Cause, Treatment, Research Progress

1. Background

Lymphatic leakage in the groin area is a common complication after surgery in the groin area, and the incidence is between 5% and 87% [1,2]. The treatment of inguinal lymphadenopathy is difficult and the treatment effect is not good, which often leads to prolonged hospital stay, increased treatment costs, increased complications, patient suffering, and difficult treatment. At present, there is no uniform standard for the diagnosis of lymphatic leakage, there is no uniform diagnostic standard for lymphatic leakage, and there is no comprehensive treatment guideline [3]. This review attempts to summarize the causes of inguinal lymphadenopathy and current treatment methods by reviewing literature reports, analyzing the advantages and disadvantages of various methods, providing a reference for clinicians' treatment, and hoping to help shorten the treatment time and improve the treatment effect.

2. Materials and Methods

Due to the abundance of lymph nodes and lymph vessels in the groin area, in theory, any lymphatic inguinal area may be damaged by surgery. However, only lymphatic leaks that require special clinical treatment are diagnosed separately. It has been reported that since day 3 after lymph node dissection, the drainage tube drains >100 ml of light yellow liquid for more than 2 consecutive days, which can be defined as lymphatic leakage [4], which has certain clinical reference value. The following is a summary of the causes and treatments of inguinal lymphatic leakage according to literature reports: Anatomical characteristics of the groin area.

3. Causes of Lymphatic Leakage

The anatomical structure of the groin region has certain specialities and can involve multiple specialties in clinical surgery [5]. The saphenous vein and femoral arteriovenous diseases belong to the category of vascular surgery [6], inguinal lymph node dissection belongs to gynecology or male reproductive surgery [7], local soft tissue malignant tumors of the groin can be classified as tumor surgery, and hip surgery belongs to orthopedics [8]. The primary lesions of various specialized diseases are mostly unrelated to lymph, and are easily ignored by the surgeon. At the same time, the lymphatic vessels and lymph nodes in the groin area are densely distributed, and the specific location is difficult to determine. There are many small lymphatic vessels, which are colorless and transparent. They form lymphatic fat masses in the femoral triangle. They are easily damaged during surgery, and it is difficult to be accurate and complete. Ground ligation, leading to lymphatic leakage [9]. In addition, when the lymphatic reflux in the groin area is damaged, it is difficult to establish other reflux channels in a short time, and there is a certain reflux pressure in the lymphatic stump. In addition, if the groin is large or deep, such as a malignant tumor Lymph node dissection is required, usually requiring extensive separation of the subcutaneous tissue around the incision to form a large wound. Subcutaneous space is easy to remain after surgery, and lymphatic vessels lose compression, resulting in difficulty in closing the lymphatic vessels [10,11]. In addition, the body mass index (BMI) and the extent of the resected lymph tissue have statistical significance for the incidence of lymphatic leakage. Obese patients and patients with a large lymphadenectomy have a higher incidence of inguinal lymphatic leakage [12]. The above reasons require the operator to fully understand and consider before the operation, which helps to avoid or reduce the occurrence of postoperative lymphatic leakage, and has certain reference value for the treatment of postoperative lymphatic leakage.

4. Choice of Treatment and its Role

4.1 Lymphatic Leakage Treatment Principles

The lymphatic vessels are continuously open and cannot be closed. Under the pressure of lymphatic reflux, the lymph fluid continues to leak into the wound cavity. Therefore, patients with inguinal lymphadenopathy should avoid frequent walking to the ground and reduce exercise to reduce the return of lymph fluid and reduce the force. The accumulation of lymph fluid within the wound increases the risk of infection, the wound becoming chronic and requiring additional surgery [13]. If the wound is closed, a lymph cyst is formed. Without complications, there is no inflammatory or granulomatous reaction at the leak site [14,15]. Lymph cysts usually occur within 3 to 8 weeks or 1 year after surgery. Most postoperative lymph cysts can be absorbed by themselves and can heal without any treatment [16]. Only 4% -7% of lymphatic cysts are symptomatic and have The average diameter of symptomatic lymphadenopathy is usually greater than 5 cm [17]. Interventions are needed when pain, infection or compression of important structures occurs.

Lymphatic leakage is a postoperative complication of controversial treatments. To date, there is no uniform treatment guideline [18]. A more reliable method is to individually evaluate each patient after fully considering the length of hospital stay, patient tolerance, compliance with treatment options, health status, and wound infections, while continuing to continue during the treatment process. Observe and adjust. Second, treatment should include a combination of methods ranging from weeks to two months of conservative treatment to surgical intervention [19]. Most patients can be successfully treated with conservative methods [20].

4.2 Negative pressure wound therapy (NPWT) and sclerosing agents

It has been reported that lymphatic leakage after vascular surgery, such as femoral artery and femoral vein surgery, often requires vacuum sealed drainage (NPWT). This treatment can avoid and reduce the accumulation of lymph fluid [21]. According to animal experiments, NPWT can increase the granulation tissue in wounds by $103.4\% \pm 35.3\%$. NPWT is believed to promote wound healing by increasing blood flow, removing wound fluid, and reducing the number of bacteria [22]. Authors describe the successful use of NPWT 11 to 19 days after femorotomy and inguinal lymphadenectomy [23,24]. Conversely, some authors believe that the routine use of negative pressure drainage in groin wounds is unnecessary [25], and may even cause lymphatic aggravation.

Drainage can alleviate symptoms by reducing the accumulation of lymph fluid. It is commonly used for most lymphatic leaks [26]. Drainage is also an important indicator for assessing the condition and formulating the

patient's next treatment plan. Percutaneous drainage is a safe method to treat lymphatic leakage, but the recurrence rate can be as high as 50% [27]. Percutaneous drainage combined with sclerosing agents can significantly reduce the recurrence rate, including Etilefrine, Octreotide, Doxycycline, ethanol, Lipiodol, etc. [28-30]. The success rate of sclerotherapy in the literature is 88% -100% [31]. The success criteria were the recovery of clinical signs and symptoms, as well as a maximum drainage of 10 ml / day, and the disappearance of lymphocysts.

Contrast agents, such as Lipiodol, patent blue V dye and Floseal, indocyanine green fluorescence [32-35], are injected into the lymphatic vessels of the dorsal foot. Lymphangiography can be used for diagnosis and treatment to close the leak [36]. The cause may be fibrosis and lymphatic occlusion caused by the inflammatory response caused by the contrast agent. Lymphangiography has reported several complications, including tissue necrosis, fat embolism, and allergic reactions [37], with some limitations. Radiotherapy has been shown to promote the recovery of inguinal lymphadenopathy and may be related to tissue sclerosis [38].

4.3 Intrawound adhesives and other non-surgical treatments

If it is difficult to determine the specific location and extent of the leak, try extensively using adhesives in the wound, such as Tachosil, Fibrin glue, fibrin sealant combined with fibrinolysis inhibitor, Bioglue [39-44], etc., to cure all potential leaks during surgery. Fibrin glue has been used clinically for nearly 40 years, but some research results have shown that in the treatment of lymphatic leakage in other parts, it can not reduce the drainage of lymphatic leakage or shorten the time of catheterization [45]. Lymphatic bioprotein gel embolization has been reported to be effective in the treatment of lymphatic leakage [46,47]. Studies have shown that infrared irradiation or radiation treatment of tissues around the wound can reduce the amount of lymphatic leakage and effectively improve the treatment effect. There is a statistical difference [48].

4.4 Surgery treatment

Some authors believe that surgical intervention for lymphatic leakage should be performed first, because ligation or suture of the leaked site early can help reduce leakage and promote wound healing and shorten the length of hospital stay [49]. Refractory leakage can be repaired with more aggressive methods, including microsurgical anastomosis of lymphatic vessels and veins, which can significantly improve the treatment of lymphatic leakage [50,51]; Ligation of lymphatic vessels [52], and wound suture combined with fibrin glue in the wound can improve the treatment effect [53].

5. Conclusions

If analyzed from the perspective of anatomical structure, the cause of inguinal lymphadenopathy is clear, but it is difficult to prevent it on a clinical basis. In other words, it is difficult for the surgeon to determine whether lymphatic leakage will occur after surgery [54]. Only through intraoperative management can minimize the chance of postoperative lymphatic leakage. If lymphatic leakage occurs after surgery, the treatment methods include pressure bandaging, non-invasive percutaneous suture, expanded wound suture, sclerosant injection in the soft tissue at the edge of the wound, contrast agent or other drugs intralymphatic embolization, Lymphatic stump and venous anastomosis, infrared treatment of the wound, radiation treatment, etc. have been performed in micro-surgery. A variety of methods have been proven to achieve results. The doctor can make an appropriate choice based on the wound situation and his own conditions.

Authors' contributions

Zhuang YQ and Fu XK participated in the analysis, and writing of the manuscript. Fu XK contributed to the project conception, study design, and writing of the manuscript. All authors read and approved the final manuscript.

Conflicts Of Interest

The authors declare that they have no conflicts of interest with the contents of this article.

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