

## Adverse Effects of Lymphatics in Heart Failure

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### DESCRIPTION

Lymphedema refers to tissue swelling caused by the accumulation of protein-rich fluid that is normally drained through the body's lymphatic system. The lymphatic system collects excess fluids, proteins, and toxins from cells and tissues and returns them to the bloodstream. When the lymphatic system is not working well, the body retains water and begins to swell. Swelling usually affects the arms and legs, but it can also affect other areas of the body. A variety of conditions can lead to peripheral edema, like deep vein thrombosis, cellulitis, venous insufficiency and congestive heart failure. Edema in heart failure patients reflects the inability of the lymphatic system to remove excess water from tissues. Lymphatic contractility or anatomical lymphatic variants may influence the clinical presentation of heart failure. Alteration of lymphatic flow is a potential therapeutic approach for treating heart failure. Tissue edema in congestive heart failure occurs only when the lymphatic system fails or is occupied by fluid leaving the vascular space across the wall of the capillaries into the interstitial space. People with heart problems, especially congestive heart failure, can develop lymphedema. Lymphatic ducts carry lymph back to the heart. If the heart is not working properly, people may notice gaining weight and have swollen legs. Blood vessels carry 80% to 90% of the fluid throughout the body. Chronic vascular problems can occur when something affects the blood vessels (vascular system). Chronic vascular problems can lead to lymphedema.

Lymphedema can also occur after specific surgeries or due to certain medical or genetic conditions. Lymph nodes are an important part of the lymphatic system. Lymphedema can also

be occurred by cancer treatments that remove or damage the lymph nodes. Any kind of problem that blocks the flow of lymph can lead to lymphedema. The person may develop lymphedema naturally as it occurs for an unknown cause. Symptoms of lymphedema may be mild, causing slight swelling and discomfort. However, at times lymphedema can cause severe swelling which gives more pain that can lead to skin infections and wounds, heaviness or tightness, limited range of motion, recurring infections, and hardening or thickening of the skin. If the person has lymphedema, the arms, legs, feet, and other parts of the body may look and feel swollen. Lymphedema is painful and interferes with the daily life activities. In Stage 0, the affected area may feel swollen, tight, and heavy, but there are no signs of swelling on the outside. In Stage I, upraising the affected area may relieve the swelling. In Stage II, the affected area is almost swollen always and the skin in that area may feel tighter than the surrounding area. In stage III, the affected area is very swollen and skin changes such as changes in colour and texture. One of the early signs of congestion in patients with chronic heart failure is peripheral edema. Under normal conditions, cardiac lymphatic flow varies greatly with changes in heart rate and contractility. The increased interstitial fluid inhibits with the systolic and diastolic myocardial function and thus may contribute to worsening heart failure. New imaging techniques have the potential to provide new insights into lymphatic contribution to tissue edema in the heart failure. Lymph is passively drained into the heart, relying entirely on the powerful cardiac muscular contraction and relaxation. Active lymph pumping has emerged as an important mechanism for lymphatic drainage in other tissues.

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