We read with great interest the article (August 2000) by Vasquez-Jimenez et al. [1]. They emphasized the cardiac lymph fluid as the most direct medium for analyzing metabolic changes in the myocardial cell.

The lymphatic drainage of the heart flows from subendocardial vessels to an extensive capillary plexus lying throughout the subepicardium [2]. The lymphatics begin in the tissues with blind-end lymphatic capillaries. These capillaries are very porous and easily collect large particles accompanied by interstitial fluid [3]. Endothelial cells of the venous microcirculation and lymphatic vessels provide the exit sites and also work as conduits for some metabolic end products of myocytes and some hormonal substances.

Endothelial cells of the lymphatic capillaries are anchored within the interstitium and to neighboring myocytes by a fibrillar collagen network. When the interstitial fluid volume rises, it serves to exert a tension on these collagen fibers and dilates lymphatic capillaries to foster the clearance of tissue fluid.

The extensive lymphatic circulation of the myocardium is responsible for returning tissue fluid and plasma protein that gained access to the interstitium to the systemic and osmotic pressures and the fluid volume of the extracellular space, while protecting against interstitial edema.

Cardiac lymph also contains hormones that were released into the interstitium from secretory granules (atrial natriuretic peptide) and adrenergic neurons (norepinephrine) [4]. These substances can have important systemic effects.

Another function of the cardiac lymph relates to the removal of cellular elements and tissue debris from the interstitium. This makes the lymphatic circulation an essential element in the myocardium’s response to injury and wound healing.

Because of these functions, the lymphatic system plays an important role for myocardial functions and cardiac lymph fluid can be used as markers for the myocardial edema, reperfusion injury and myocardial damage.

We have several concerns regarding the issue. We would like to ask the authors about the importance of lymphatic circulation on myocardial protection. As they know, we have to create external pressure on superior vena cava (SVC) (by using snare or vena cava clamp) for some open heart surgeries that require total cardiopulmonary bypass and total circulatory arrest (valve surgeries, congenital heart disease, arcus and ascending aorta surgery, etc.). We wonder, if the connection system and contractility might be affected with myocardial edema that caused by impaired lymphatic circulation, especially in the ‘right drainage types’. Do they advise using cuffed venous cannules to prevent this problem?

We understand that the researchers were snared SVC, while preparing the swine heart. Did they find any difference in flow rate on the ‘right drainage type’ compare with the other types?

Also, we want to learn if the impaired lymphatic circulation has any role on early graft failure of orthotopic and heterotopic heart transplantation and how the lymphatic system regenerates itself on these cases.

The knowledge on cardiac lymphatics is very limited and their importance is almost always neglected in cardiac surgery practice. So, we congratulate the authors for such a good paper related the subject. We think, Dr Vasquez-Jimenez and his colleagues deserve credits for their contributions on this unique subject.

References


[3] Mohrman DE, Heller LJ. Homeostasis and cardiovascular transport, 4...