Pulmonary edema

Pulmonary edema (American English), or oedema (British English; both words from the Greek οἴδημα), is fluid accumulation in the air spaces and parenchyma of the lungs.

It leads to impaired gas exchange and may cause respiratory failure. It is due to either failure of the left ventricle of the heart to adequately remove blood from the pulmonary circulation ("cardiogenic pulmonary edema"), or an injury to the lung parenchyma or vasculature of the lung ("noncardiogenic pulmonary edema").

Treatment is focused on three aspects: firstly improving respiratory function, secondly, treating the underlying cause, and thirdly avoiding further damage to the lung. Pulmonary edema, especially acute, can lead to fatal respiratory distress or cardiac arrest due to hypoxia. It is a cardinal feature of congestive heart failure.

Fatal pulmonary edema and hemorrhage are significant complications of endovascular treatment in steno-occlusive carotid artery disease; a rational mechanism has not been adequately examined in the literature so far.

Arslan et al. investigated if cervical sympathetic ganglia ischemia prevents pulmonary vasospasm on the prognosis of bilateral common carotid artery ligation (BCCAL). Twenty-three adult New Zealand rabbits ($4.2 \pm 0.3 \text{ kg}$) were randomly divided into three groups: the control group (G1, n = 5), the sham group (G2, n = 6), and the BCCAL group (G3, n = 12). Common carotid arteries were dissected bilaterally in G2/G3, and permanent BCCAL was applied to only in G3. All animals were followed for 3 weeks and decapitated under general anesthesia. Histopathological changes in stellate ganglia and severity of pulmonary vasospasm-related lung edema and hemorrhage were investigated. Results were analyzed by the Kruskal-Wallis test. Two animals of G3 dead within three weeks and the remainder were sacrificed three weeks later. Subpleural petechial foci and an endotracheal bloody fluid collection were grossly observed in the lungs. Histopathologically, pulmonary artery vasospasm, perivascular and subintimal edema, interalveolar hemorrhage, and alveolar wall destructions were observed with less ischemic-degenerated neuron density-determined stellate ganglia animals. Neurodegeneration of stellate ganglia may have a beneficial effect on the prevention of lung injury during steno-occlusive carotid artery disease ¹⁾.

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Arslan R, Aydin ME, Karadag MK, Caglar O, Karadeniz E, Aydin MD. Stellate ganglion ischemia on the prevention of pulmonary vasospasm during bilateral carotid artery ligation: The first experimental study [published online ahead of print, 2020 Jul 16]. Neuropathology. 2020;10.1111/neup.12655. doi:10.1111/neup.12655

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