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Lung Diseases

Common Indications for Single Lung Transplantation:

Idiopathic Pulmonary Fibrosis – is a group of diseases of the lower respiratory tract that leads to the loss of the functional alveolar (air sac) units and a limit in the transfer of oxygen from air to blood. There is widespread inflammation and deposition of scar tissue within the lung tissue.

Bronchiolitis Obliterans – is an inflammation of the bronchioles usually due to a viral infection. The peripheral airways are primarily affected; the arterial PO2 will be low because of mismatching of air movement (ventilation) and blood flow (perfusion).

Lymphangioleiomyomatosis (LAM) – is a disease characterized by an unusual type of muscle cell that invades the tissue of the lungs, including the airways, and blood and lymph vessels. Over time, these muscle cells form into bundles and grow into the walls of the airways, causing them to become obstructed. Although these cells are not considered cancerous they grow without the usual controls within the lungs. Over time, the muscle cells block the flow of air, blood, and lymph to and from the lungs, preventing the lungs from providing oxygen to the rest of the body.

Sarcoidosis – is a disease of unknown origin (although generally thought to be an auto-immune disease), which occurs when areas of inflammation grow in different organs of the body. Very small growths, called granulomas, are associated with it and occur in the lungs, lymph nodes, eyes, skin, and spleen. These growths may clear up on their own or cause permanent damage. The pulmonary dysfunction may be obstruction, restriction, and impairment of diffusion or any combination of the three.

Severe Obstructive Pulmonary Disease:

Asthma – characterized by an increased responsiveness of the trachea and bronchi to various stimuli, and manifested by widespread narrowing of the airways, that changes in severity.

Emphysema – begins with the destruction of air sacs (alveoli) in the lungs where oxygen from the air is exchanged for carbon dioxide in the blood. Damage to the air sacs is irreversible and results in permanent "holes" in the tissues of the lower lungs. As air sacs are destroyed this results in hyperinflation and the lungs are able to transfer less and less oxygen to the bloodstream, causing shortness of breath. As a result of hyperinflation, the total lung capacity (TLC) is greater than normal and the vital capacity

(FVC) is reduced because of hyperinflation and the FEV1 is reduced due to obstruction of airflow.

Alpha$_1$-antitrypsin Deficiency (sometimes called Genetic Emphysema) – is a genetic disease that is caused by an inherited lack of a protective protein called alpha$_1$-antitrypsin (AAT). AAT protects the lungs from a natural enzyme (neutrophil elastase) that helps fight bacteria. This enzyme, which is normally helpful, will attack the walls of alveoli causing destruction. The lungs lose their elasticity, causing patients great difficulty in exhaling.

Primary Pulmonary Hypertension – is a rare obliterative disease of unknown cause involving the medium and small pulmonary arteries. Causes a decrease in the diffusion of oxygen across the alveoli and causes right-sided heart failure.

Common Indications for Double Lung Transplantation:

This is often reserved for those patients with end-stage infectious lung diseases and for those where there is significant risk that the native lung would adversely affect the newly transplanted lung. In addition to cystic fibrosis and bronchiectasis, some transplant programs prefer to transplant both lungs in patients with primary pulmonary hypertension, lymphagioleimyomatosis, alpha$_1$-antitrypsin deficiency, and idiopathic pulmonary fibrosis.

Cystic Fibrosis (CF) – is a common fatal genetic disease. The basic defect in CF cells is the faulty transport of sodium and chloride (salt) within epithelial cell – which line organs such as the lungs and pancreas – to the cells outer surfaces. CF causes the body to produce abnormally thick, sticky mucus. This abnormal mucus clogs the lungs and leads to fatal infections. The thick CF mucus also obstructs the pancreas, preventing enzymes from reaching the intestines to digest food.

Bronchiectasis – is a chronic disease that damages the muscle and elastic tissue of the airways within the lungs. Permanent dilation of the airways can be a result of the damaged bronchial wall. Dilation can be a uniform enlargement or irregular and result in the formation of pouches. The pouches in the airways are susceptible to infection because bacteria thrive in these warm, dark and moist areas.

Common Indications for a Combined Heart-Lung Transplantation:

Eisenmenger's Syndrome (in cases where the heart defect cannot be repaired) – is a congenital heart defect consisting of ventricular septal defect, pulmonary hypertension with pulmonary artery enlargement and increased size of the right ventricle.

Patients with severe heart disease in conjunction with the lung disease due to any of the conditions listed above.

Common Indications for a Living-Related Lung Transplantation:

Patients, who, due to their declining lung function, will not survive the wait for a cadaver organ.