REFFERAL FOR LUNG TRANSPLANTATION

Farahnaz Sadegh Beigee M.D.

Assistant professor of thoracic surgery

Shahid Beheshti University of Medical Sciences

History

- Hardy performed the first human lung transplantation in 1963
- In the 1980s, the introduction of cyclosporine
- (HLTx) from 1981 , single lung transplantation

(SLT) from 1983, and bilateral lung transplat(BLTx) from 1985

- More than 40 attempts were undertaken

over a period of almost 18 yrs before the first long-term survivor was achieved

- reported 1-, 2- and 5-yrs survival of 80%, 72% and 54%, respectively

General candidacy considerations

- chronic, end-stage lung disease who meet all the following :

1. High(>50%) risk of death from lung disease within 2 years if lung transplantation is not performed.
2. High(>80%) likelihood of surviving at least 90 days after lung transplantation.
3. High(>80%) likelihood of 5-year post-transplant survival from a general medical perspective provided that there is adequate graft function.

WHEN?

- severe life threatening respiratory diseases refractory to conventional therapies
- when the patient is symptomatic during daily living activities
- survival is expected to be limited to 2–3 yrs, which represents

WHO?

- disparity between the number of potential recipients and the number of donor organs
- many patients dying on the waiting lists
- importance to identify those patients who have a better chance of a favorable outcome with transplantation
- Critically ill patients in desperate clinical situations are rarely appropriate candidates for LTx.
- In all, 37% of referred patients achieved active listing status
- 20% of whom died waiting for a donor

CONTRAINDICATIONS

Absolute contraindications

- Malignancy in the last 2 years, with the exception of cutaneous squamous and basal cell tumors. In general, a 5-year disease-free interval is prudent. The role of lung transplantation for localized bronchioalveolar cell carcinoma remains controversial.
- Untreatable advanced dysfunction of another major organ system (e.g., heart, liver, or kidney). Coronary artery disease not amenable to percutaneous intervention or bypass grafting, or associated with significant impairment of left ventricular function, but heart-lung transplantation could be considered in highly selected cases.

- Non-curable chronic extra pulmonary infection including chronic active viral hepatitis B, hepatitis C, and human immunodeficiency virus.
- Significant chest wall/spinal deformity.
- Documented no adherence or inability to follow through with medical therapy or office follow-up, or both.
- Untreatable psychiatric or psychological condition associated with the inability to cooperate or comply with medical therapy.
- Absence of a consistent or reliable social support system.
- Substance addiction (e.g., alcohol, tobacco, or narcotics) that is either active or within the last 6 months.

RELATIVE

– Age older than 65 years

Critical or unstable clinical condition

● Severely limited functional status with poor rehabilitation potential

● Colonization with highly resistant or highly virulent bacteria, fungi, or mycobacteria

● Severe obesity defined as a body mass index (BMI) exceeding 30 kg/m2

– Severe or symptomatic osteoporosis.

● Mechanical ventilation

- Other medical conditions that have not resulted in end-stage organ damage, such as diabetes mellitus, systemic hypertension, peptic ulcer disease, or gastroesophageal reflux should be optimally treated before transplantation.
- coronary artery disease: percutaneous intervention before transplantation or *concurrent* coronary artery bypass grafting

Interstitial lung disease
Timing of referral

- Histopathologic or radiographic evidence of usual interstitial pneumonitis(UIP)or fibrosis
- non-specific interstitial pneumonitis(NSIP),regardless of lung function.
- Abnormal lung function: forced vital capacity (FVC)< 80% predicted or diffusion capacity of the lung for carbon monoxide(DLCO) <40% predicted.
- Any dyspnea or functional limitation attributable to lung disease.
- Any oxygen requirement, even if only during exertion.
- For inflammatory interstitial lung disease (ILD), failure to improve dyspnea, oxygen requirement, and/or lung function after a clinically indicated trial of medical therapy.

Timing of listing

- Decline in FVC >10% during 6 months of follow-up (note: >5%decline is associated with a poorer prognosis and may warrant listing).
- Decline in DLCO >15% during 6 months of follow-up.
- Desaturation to <88% or distance <250 m on 6-minute-walk test or> 50 m decline in 6-minute-walk distance over a 6-month period.
- Pulmonary hypertension on right heart catheterization or 2-dimensional echocardiography.
- Hospitalization because of respiratory decline, pneumo-thorax, or acute exacerbation

COPD

- **Guidelines for Referral**
- Disease is progressive
- Is not a candidate for endoscopic or surgical LVRS
- PaCo2>50, PaO2<60
- FEV1<25%
- BODE index exceeding 5-6
- **Guidelines for Transplantation**
- ● Patients with a BODE index >7
- ● History of three or hospitalization for exacerbation during one year
- ● Pulmonary hypertension or corpulmonar, or both, despite oxygen therapy
- ● FEV1 of less than 20% and either DLCO of less than 20% or homogenous distribution of emphysema

CF

- Guidelines for Referral
- ● FEV1 below 30% predicted or a rapid decline in FEV1 in particular in young female patients
- ● Exacerbation of pulmonary disease requiring ICU stay
- ● Increasing frequency of exacerbations requiring antibiotic therapy.
- ● Refractory and/or recurrent pneumothorax.
- ● Recurrent hemoptysis not controlled by embolization.
- Guideline for Transplantation
- ● Oxygen-dependent respiratory failure.
- ● Hypercapnia.
- ● Pulmonary hypertension.

IPF

- **Guideline for Referral**
- ● Histologic or radiographic evidence of UIP irrespective of vital capacity.
- ● Histologic evidence of fibrotic NSIP.
- **Guideline for Transplantation**
- ● Histologic or radiographic evidence of UIP and any of the following:
  - ● A DLCO of less than 39% predicted.
  - ● A 10% or greater decrement in FVC during 6 months of follow-up.
- ● A decrease in pulse oximetry below 88% during a 6-MWT.
- ● Honeycombing on HRCT (fibrosis score of 2).
- ● Histologic evidence of NSIP and any of the following:
  - ● A DLCO of less than 35% predicted.
  - ● A 10% or greater decrement in FVC or 15% decrease in DLCO during 6 months of follow-up.

PAH

- **Guideline for Referral**
- ● functional class III or IV, irrespective of ongoing therapy.
- ● Rapidly progressive disease.
- **Guideline for Transplantation**
- ● Persistent NYHA class III or IV on maximal medical therapy.
- ● Low (<350 meter) or declining 6-MWT.
- ● Failing therapy with intravenous Epoprostenol, or
- equivalent.
- ● Cardiac index of less than 2 liters/min/m2.
- ● Right atrial pressure exceeding 15 mm Hg.

LYMPHANGIOLEIOMYOMATOSIS

- Guideline for Referral
- ● NYHA functional class III or IV.
- Guideline for Transplantation
- ● Severe impairment in lung function and exercise capacity (e.g., VO2 max 50% predicted).
- ● Hypoxemia at rest.

PULMONARY LANGERHANS CELL HISTIOCYTOSIS (EOSINOPHILIC GRANULOMA)

- Guideline for Referral
- ● NYHA functional class III or IV.
- Guidelines for Transplantation
- ● Severe impairment in lung function and exercise capacity.
- ● Hypoxemia at rest.

SARCOIDOSIS

- Guideline for Referral
- ● functional class III or IV.
- Guideline for Transplantation
- ● Impairment of exercise tolerance (NYHA functional class III or IV) and any of the following:
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– Severe or symptomatic osteoporosis.

● Mechanical ventilation

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- Guideline for Transplantation
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- ● Hypercapnia.
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