BELGIAN RESPIRATORY SOCIETY

Guidance to Belgian referral criteria for lung volume reduction and lung transplantation in patients with severe emphysema-COPD

ENDORSED BY THE BERS SCIENTIFIC COUNCIL

PRELIMINARY NOTE

The following document presents referral criteria for lung volume reduction (LVR) and lung transplantation (LTx).

These criteria should be understood as guidance. In case of doubt, we suggest to refer to the expert centers.

Once patients referred, the expert centers are discussing the indication of treatment options within multidisciplinary meetings.

This discussion may lead to the request for additional tests and sometimes to repeat tests already performed.

The goal of the process is to come to a final decision and to state whether the patient is a candidate for endoscopic and/or surgical LVR and/or LTx.

For some patients, LTx might be the preferred option when there is no indication for LVR. For the younger patients, LVR might be proposed as a bridge to LTx.

On the opposite, for patients over the age of 60, the improvement that a LVR procedure can afford and its maintenance over time could rule them out of a future LTx option because of the age limit.

This will be discussed with them at the expert center.

In some patients who are candidates for LVR, with no obvious contra-indication for LTx, an additional pre LTx workup might be requested before the LVR procedure.

This is particularly the case for patients with very severe impairment. In these patients, knowing that LTx may or not be a future option is important information in the event LVR does not provide the expected improvement.

LUNG VOLUME REDUCTION FOR SEVERE EMPHYSEMA

REFERRAL CRITERIA FOR LUNG VOLUME REDUCTION

COPD patients that should be referred for LVR are stable patients with

- emphysema,
- severe hyperinflation and
- disabling dyspnea despite optimal medical treatment.

Hyperinflation and emphysema heterogeneity are **key selection criteria.** The latter will be assessed in detail during multidisciplinary meetings in the expert center.

More precisely, candidate patients should meet the following criteria:

- **Disabling dyspnea (mMRC ≥ 2) despite optimal medical therapy including**
  - o Smoking cessation;
  - o LABA-LAMA
  - o ICS and/or azithromycin, when appropriate;
  - o Pulmonary rehabilitation. For patients not yet included in a rehabilitation program, motivation, willingness and ability to engage in a pulmonary rehabilitation program is a prerequisite;
  - o Long-term oxygen therapy, when appropriate.
- **PFTs criteria:**
  - Post-bronchodilator FEV1 ≤ 50% pred (GLI ref. equation)*;
  - Severe hyperinflation defined as
    - o RV ≥ 175% pred (GLI ref. equation), measured by body plethysmography*;
    - o RV/TLC > 0.55.

** Reimbursement criteria for endobronchial valves.*

- **Imaging criteria**

Presence of moderate to severe emphysema on lung CT scan.

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CONTRAINDICATION FOR LUNG VOLUME REDUCTION

COPD patients with the following characteristics are not good candidates for LVR and should not be referred if at least one of the following criteria is met in stable state and under optimal therapy

- Severe chronic hypoxemia i.e., PaO2 breathing room air < 45 mmHg*;
- Severe chronic hypercapnia i.e., PaCO2 > 60 mmHg*;
- Significant pulmonary hypertension confirmed by right heart catheterization (PAPm > 30 mmHg)*,§;
- Bronchorrhea (need for daily or regular chest drainage)*;
- Uncontrolled asthma*;
- ILD*;
- Active lung parenchymal disease, whether inflammatory* or infectious;
- Active lung cancer;
- Diaphragm paralysis;
- Patients with pulmonary nodule without proof of prolonged stability, unless discussed for LVRS allowing for resection of the nodule (to be assessed at the expert center);
- Chronic heart failure with left ventricular ejection fraction < 40%.

** These patients might be candidates for LTx.*

§ Right heart catheterization can be performed after referral, at the treating center.

LUNG TRANSPLANTATION FOR COPD

REFERRAL CRITERIA FOR LUNG TRANSPLANTATION IN COPD PATIENTS

- **BODE score ≥ 5-6 under optimal medical therapy including**
  - o Smoking cessation;
  - o LABA-LAMA;
  - o ICS and/or azithromycin, when appropriate;
  - o Pulmonary rehabilitation. In patients not yet included in a rehabilitation program, motivation, willingness and ability to engage in a pulmonary rehabilitation program is a prerequisite;
  - o Long-term oxygen therapy, when appropriate.
- **AND the presence of additional factor(s) suggestive of increased risk of mortality**
  - o History of exacerbation with the need for assisted ventilation (including noninvasive ventilation), or a history of frequent exacerbation (> 2/year);
  - o Increase in BODE score > 1 over the past 24 months;
  - o Main pulmonary artery to aorta diameter > 1 on CT scan and/or evidence of significant pulmonary hypertension (PAPs > 45 mmHg);
  - o FEV1 ≤ 25% predicted;
  - o TLCO ≤ 30% predicted.

These criteria are for guidance. In case of doubt, patients should be discussed with the LTx center before referral, particularly for those who do not quite meet the criteria but with rapid deterioration and/or poor quality of life deemed unacceptable by the patient.
The indication for LTx is usually not discussed in an acute setting. There are, however, rare cases in which LTx might be discussed in an acute situation. These should be discussed before referral with the LTx center.

CONTRAINDICATION FOR LUNG TRANSPLANTATION

Some situations are **absolute contraindications** for LTx and when present, patients should not be referred to expert centers:

- Age > 70 years. Patients over 65 years are usually not candidates for LTx but may be referred in the absence of any significant comorbidity;
- Lack of patient willingness or acceptance of LTx;
- Malignancy with high risk of recurrence or death related to cancer. In case of remission of malignancy that is shorter than 5 years, this should be discussed before referral with the LTx center;
- Irreversible left heart failure with left ventricular ejection fraction < 40% despite optimal treatment unless being considered for heart + LTx;
- Glomerular filtration rate < 40 mL/min/1.73m2 unless being considered for kidney + LTx;
- Liver cirrhosis with portal hypertension or chronic liver synthetic dysfunction unless being considered for liver + LTx;
- Active tuberculosis infection;
- HIV infection with detectable viral load;
- Limited functional status (e.g., non-ambulatory patient) with poor potential for post- LTx rehabilitation
- Progressive cognitive impairment;
- Repeated episodes of non-adherence without evidence of improvement;
- Active substance use or dependence including current tobacco use, vaping, cannabis smoking, or IV drug use < 6 months before referral;
- Other severe uncontrolled medical condition expected to limit survival after transplant.

Besides these absolute contraindications, a series of **relative contraindications** (medical and psychosocial) also exists. These are taken into consideration during multidisciplinary meetings at the LTx center. The integration of all data can lead to not proposing a LTx despite the absence of absolute contraindication.

Please note that a previous LVR (surgical or endoscopic) is NOT a contraindication for LTx.

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