External respiratory function in a patient after removal of the middle and lower lobes of the right lung (pulmonary compensatory possibilities of ventilation lung function)

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INTRODUCTION:
Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases*. The chronic airflow limitation that is characteristic of COPD is caused by a mixture of small airways disease (e.g., obstructive bronchiolitis) and parenchymal destruction (emphysema), the relative contributions of which vary from person to person.

*GOLD, updated 2016
## Combined Assessment of COPD

<table>
<thead>
<tr>
<th>Patient</th>
<th>Characteristic</th>
<th>Spirometric Classification</th>
<th>Exacerbations per year</th>
<th>CAT</th>
<th>mMRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Low Risk, Less Symptoms</td>
<td>GOLD 1-2</td>
<td>≤ 1</td>
<td>&lt; 10</td>
<td>0-1</td>
</tr>
<tr>
<td>B</td>
<td>Low Risk, More Symptoms</td>
<td>GOLD 1-2</td>
<td>≤ 1</td>
<td>≥ 10</td>
<td>≥ 2</td>
</tr>
<tr>
<td>C</td>
<td>High Risk, Less Symptoms</td>
<td>GOLD 3-4</td>
<td>≥ 2</td>
<td>&lt; 10</td>
<td>0-1</td>
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<tr>
<td>D</td>
<td>High Risk, More Symptoms</td>
<td>GOLD 3-4</td>
<td>≥ 2</td>
<td>≥ 10</td>
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</tr>
</tbody>
</table>
Classification of Severity of Airflow Limitation in COPD

IN PATIENTS WITH FEV$_1$/FVC < 0.70:

GOLD 1: MILD  \hspace{1cm} \text{FEV}_1 \geq 80\% \text{ PREDICTED}

GOLD 2: MODERATE \hspace{1cm} 50\% \leq \text{FEV}_1 < 80\% \text{ PREDICTED}

GOLD 3: SEVERE \hspace{1cm} 30\% \leq \text{FEV}_1 < 50\% \text{ PREDICTED}

GOLD 4: VERY SEVERE \hspace{1cm} \text{FEV}_1 < 30\% \text{ PREDICTED}
OUR PATIENT

PATIENT BOREC. T.V.

• 61 YEARS OLD
• ENGINEER
• CITY RESIDENT
• DATE OF ADMISSION: 07/12/2016

COMPLAINTS

❖ Recurrent dry cough
❖ Shortness of breath
❖ Headache
❖ Dizziness
❖ Fatigue
❖ Weakness, decreased resistance to physical stress
Anamnesis Morbi

- Patient notes recurrence of obstructive bronchitis since birth. At the age of 14 bronchoscopy was performed, year later - right-sided bilobectomy was held in connection with congenital bronchiectasis. Consequently, with a diagnosis of chronic bronchitis she was observed by the pulmonologist, during exacerbations – inpatient treatment at the hospital.

- The patient didn’t follow prescribed treatment, used drugs irregularly.

- In December 2016, suffered a sore throat, running nose, cough and fever till 38.5 for 3 days. Further joined the above symptoms. She was admitted to day hospital of policlinic 24 for diagnosis: Chronic obstructive pulmonary disease (COPD). Chronic diffuse bronchitis in remission, condition after right-bilobektomia (1970) due to congenital bronchiectasis.

- Patient received mucolytics (pectolvan C), antiviral drugs (amizon)
Anamnesis Vitae

- Infections, injuries, tuberculosis, sexually transmitted diseases were denied.
- Hereditary diseases are not identified.
- Allergological history is not burdened.
- Smoking denies but her husband is smoker.
- Using chemical agents for cleaning house
OBJECTIVE STATUS

- General condition: moderate, conciseness - clear, posture - active. Patient can orientate herself in place, time, personality.
- Height – 168cm, weight – 57 kg, BMI – 20,28
- Skin and mucosae are pale, moist, clean.
- Thyroid: no pathological changes.
- Skeleto-muscular system: deformity of the chest after sternotomy.
- RR – 20 /min.
- Lung percussion: pulmonary below scapula angles from both sides
- Lung auscultation: decreased vesicular breathing, wheezing in inferior parts of both sides of lungs
- Borders of the heart: left border shifted to the left on 4 cm
- Heart auscultation: heart tones rhythmic, clear
- Pulse – rhythmic, 65 bts/min
- BP 130 / 80 mm Hg.
- Abdomen: symmetric
- Liver: +2sм.
- Spleen: not palpable
- Edemas: absent.
- Varicose vein disease of lower extremities – absent.
- Pasternatskiy sign is negative on both sides. Urination is free, painless.
- **CLINICAL BLOOD TEST (CBT) AND URINE ANALYSIS** - ALL PARAMETERS WITHIN THE NORMAL RANGE

- **BIOCHEMICAL PANEL** - ALL PARAMETERS WITHIN THE NORMAL RANGE

- **LIPID PROFILE** - ALL PARAMETERS WITHIN THE NORMAL RANGE

- **ELECTROCARDIOGRAPHY (ECG)** - SINUS RHYTHM, SIGNS OF RIGHT VENTRICULAR HYPERTROPHY

- **ULTRASOUND** -
Conclusion:
A diffuse fibrosis. The contour of the diaphragm on the right flattened, sinus obliterated by spikes. COPD. Condition after surgery on right lung. Spirography (2002): ventilation lung function is not impaired.
Spirography

Conclusion:
Ventilation lung function is not impaired
Final diagnosis

Main disease:

Concomitant diseases:
NON-PHARMACOLOGIC:
- RECOMMENDATIONS TO MAINTAIN HEALTHY LIFESTYLE, DECREASE SODIUM INTAKE, LIPID LOWERING DIET, AEROBIC NON STRENUOUS EXERCISES
- FLU VACCINATION
- PNEUMOCOCCAL VACCINATION

PHARMACOLOGIC:
- TIOTROPIUM 18 MCG (SPIRIVA HANDIHALER) 1 TIME PER DAY FOR A LONG TIME
- SALBUTAMOL 100 MCG (VENTOLIN INHALER) 3-4 TIME AND WHEN NECESSARY
- LISINOPRIL 10 MG IN THE MORNING UNDER BLOOD PRESSURE CONTROL;
- ASPIRIN 75MG ONCE DAILY CONTINUOUSLY;
- REPEAT SPIROGRAPHY AFTER 3 MONTHS
- REPEAT VISIT TO PNEUMONOLOGIST, ENDOCRINOLOGIST AFTER 3 MONTHS.

EXACERBATION:
- OXYGEN (TARGET SATURATION OF 88-92%)
- SYSTEMIC CORTICOSTEROIDS (40 MG PREDNISONE PER DAY FOR 5 DAYS)
Summary and recommendation

Despite of compensatory possibilities of lungs of external respiration function is not enough for compensation of lost lung volume and the patient must be considered as a whole.

References

1. COPD. A spirometry guide for general practitioners and a teaching slide set I available: http://www.goldcopd.org


3. American Thoracic Society
http: www.thoracic.org/adobe/statements/spirometry