ENDOSURGERY IN PEDIATRIC ONCOLOGY

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What do you need to develop endosurgery in pediatric oncology?

- Large experience in conventional surgery
- Standardization of surgery in multimodal treatment approach
- Large endosurgery experience in adults
Peculiarities of endosurgery in children

- small volume of abdominal and pleural cavities
- small size of all anatomical structures
- prolonged pneumoperitoneum
- impossible to separately intubate bronchi when performing thoracoscopic operations in children under 6 years old
Endoscopic operations per year (n=309)
Kinds of endoscopic interventions (n= 309)

- 165, 53% laparoscopic
- 144, 47% thoracoscopic

Age 3 weeks – 18 y (med 7.9y)
Time 28 min – 390 min (med 95 min)
Blood loss 10 ml – 1800 ml (med 120 ml)
Types of thoracoscopic interventions (n=144)

- Lung resections: 60
- Biopsy: 40
- Removal of mediastinal tumors: 31
- Diagnostic examination: 10
- Lower lobectomy: 2
- Mature teratoma of esophagus: 1
Types of laparoscopic interventions (n=165)

- Biopsy: 63
- Nephrectomy: 30
- Adrenalectomy: 27
- Liver resections: 13
- Tubovarectomy: 9
- Diagnostic examinations: 5
- Splenectomy: 5
- Partial nephrectomy: 3
- Adrenal gland resection: 1
- Spleen resection: 2
- Resection of pancreas: 1
- Partial gastrectomy: 1
- Removal of pelvic tumor: 1
- Appendectomy: 1
- Excochleation of S1: 1
Hepatic resections (n=13)

- 1; 7%
- 5; 38.5%
- 7; 54.5%

- fissural right hemihepatectomy
- anatomical right hemihepatectomy
- resection II - III
Case # 1: 2.5 y.o. male
Diagnosis: Hepatoblastoma. 3 courses of chemotherapy (SIOPEL 2, high risk), POSTEXT II. Tumor shrinkage – 80%
In 2008 y

- Laparoscopic right hemihepatectomy
- Blood loss 90 ml
- Duration 240 min
- ICU stay - 2 days
The foto of the patient on the 1\textsuperscript{st} day after operation

- Antibiotics for 3 days post surgery
- Drainage was removed on the 2\textsuperscript{nd} day after surgery
- The chemotherapy was begun on the 7\textsuperscript{th} day
The combined using endosurgery and conventional surgery (n=3)
Localizations:

- Posterior mediastinum tumors with the spread to the retroperitoneal space
- Tumors of aperture with the spread on the neck
- Tumors of anterior mediastinum crossing the midline
**Case # 2:**

4 y.o. male.

**Diagnosis:** neuroblastoma of aperture with the spread on the neck

**Pathology:** Mixed variant of ganglioneuroblastoma. No N-myc amplification.

No radiological response after chemo, but positive MIBG response.
Operation time (two stages) - 300 min

Blood loss – 100 ml

Drainages were removed on 2\textsuperscript{nd} day

Horner’s syndrome: no change
The combination of conventional surgery and videosurgery allows to optimise operations and to avoid thoraco- or laparotomy.
### Complications and Conversions

<table>
<thead>
<tr>
<th>Complications</th>
<th>Number</th>
<th>Conversions or reoperations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bleeding</strong></td>
<td>7</td>
<td>6 (aorta, suprarenal vena, IVC, SVC, liver)</td>
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<td><strong>Eventration</strong></td>
<td>4</td>
<td>Closure of the defect in the aponeurosis</td>
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<tr>
<td><strong>Postoperative pancreatitis</strong></td>
<td>3</td>
<td>Choledocheal stricture, hepaticojejunostomy</td>
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<tr>
<td><strong>Ureteral injury</strong></td>
<td>1</td>
<td>Nephrectomy in 2 months</td>
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<tr>
<td><strong>Crossing of iliac vessels</strong></td>
<td>1</td>
<td>Prosthetic of iliac artery</td>
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Disease progression (2 cases)

- In 6 months after liver resection (multifocal tumor at presentation)
- In 9 months local relapse in retroperitoneal space of malignant shwannoma
INDICATIONS FOR ENDOSURGERY

1. Nephroblastoma – *Stage I, without cystic components in the tumor*
2. Hepatoblastoma – *PRETEXT I, POSTEXT I/II*
3. Neuroblastoma – *depends on localization and ratio of cavity size and the size of the tumor*  

*(What exact criteria? Personal experience?)*
Endosurgery can develop successfully in case of:

In accordance with oncological principles

Surgeons at any stage of operation should be ready for conversion

Videosurgical interventions should be carried out in clinics having sufficient experience of conventional surgery