National Research University Higher School of Economics
A.V.Vyshnevsky Institute of Surgery

THE OPTIMAL APPLICATION OF ROBOTIC-SURGICAL COMPLEXES IN ABDOMINAL SURGERY: THE LOGICS AND METHODOLOGY OF RESEARCH

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History

1999 - Intuitive Surgical presented «da Vinci» robotic complex

07 September 2001
Advantages of RSC

EndoWrist technology

- 10 times zoom
- fixed camera and image
- highest precision
- work in hard-to-reach zones
RSC «da Vinci» in world
Robotic assisted operations in world

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**United States**

**International**

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>International</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>2007</td>
<td>100,000</td>
<td>20,000</td>
<td>120,000</td>
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<tr>
<td>2008</td>
<td>200,000</td>
<td>40,000</td>
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<td>2009</td>
<td>300,000</td>
<td>60,000</td>
<td>360,000</td>
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<tr>
<td>2010</td>
<td>400,000</td>
<td>80,000</td>
<td>480,000</td>
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<tr>
<td>2011</td>
<td>500,000</td>
<td>100,000</td>
<td>600,000</td>
</tr>
<tr>
<td>2012</td>
<td>600,000</td>
<td>120,000</td>
<td>720,000</td>
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</tbody>
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2012 Fcst: 25 - 27% Growth
The range of robotic assisted operations (Russia, 2012)
Robot-Assisted Minimally Invasive Distal Pancreatectomy is Superior to the Laparoscopic Technique.

Division of GI Surgical Oncology, General Surgery, Hepatobiliary, Pancreatic and Endocrine Surgery, Department of Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA; Division of General Surgery, Department of Surgery, University of Florida, Gainesville, FL.

The current state of robotic-assisted pancreatic surgery.

Winer J, Czei M, Bartlett DL, Zeh HJ, Zureikat AH.
Division of GI Surgical Oncology, Department of Surgery, University of Pittsburgh Medical Center, 5150 Center Avenue, Pittsburgh, PA 15213, USA.

Laparoscopic robotic-assisted gastrointestinal surgery: the Geneva experience

Claudio Soravia, Ian Schweiger, Jacques-Alain Witzig, Frank-Alain Wassmer, Thierry Vedrenne, Pierre Sutter, Jean-Philippe Dufour, Yves Racloz

Objective evaluation of expert performance during human robotic surgical procedures

Timothy N. Judkins, Dmitry Oleynikov, Nick Stergiou

Systematic review of robotic liver resection

Cheng-Maw Ho, Go Wakabayashi, Hiroyuki Nita, Naoko Ito, Yasushi Hasegawa, Takeshi Takahara

Robotic liver surgery: Results for 70 resections

Pier Cristoforo Giulianiotti, MD, FACS; Andrea Coratti, MD, Fabio Sbrana, MD, FACS; Pietro Addico, MD; Francesco Maria Bianco, MD; Nicolas Christian Buchs, MD; Mario Annecchiarico, MD; and Enrico Benedetti, MD, FACS; Chicago, IL, and Grosseto, Italy

Robotic colon surgery: is it advisable to commence a new learning curve?

Fung AK, Aly EL
Laparoscopic Colorectal Surgery & Training Unit, Aberdeen Royal Infirmary, Aberdeen, Scotland, United Kingdom.

Single-site robotic cholecystectomy: efficiency and cost analysis.

Texas Institute for Robotic Surgery and Austin Diagnostic Clinic, Austin, TX, USA.

Comparison of robotic adenectomy with traditional laparoscopic adenectomy with a lateral transperitoneal approach: a single-surgeon experience.

You YJ, Lee HY, Seo CH, Lee JB, Bae JW, Kim HY.
Department of Surgery, Korea University College of Medicine, Seoul, Korea.

An actuated force feedback-enabled laparoscopic instrument for robotic-assisted surgery.

Moradi Daiyand M, Shirinzadeh B, Shamiadah AH, Smith J, Zhong Y.
Department of Mechanical and Aerospace Engineering, Monash University, Melbourne, Australia.

Feasibility of robotic pancreaticoduodenectomy.

Division of General and Transplant Surgery, Pisa University Hospital, Pisa, Italy.
The goal of the current survey

- is to create a system of rules for taking decisions regarding the use of RSC in abdominal surgery
The following objectives

- identify the major reasons for selecting different techniques in conducting surgery on abdominal organs;
- compare results of application of open (hand-guided) technology versus laparoscopic (LA) and robot-assisted technology in abdominal operations;
- assess clinical and economic effectiveness of operations with the use of various techniques;
- create a system of rules of the rational selection of RSC in conducting abdominal operations.
Methodology of the survey

- The results of the analysis of RA operations performed in A.V.Vyshnevsky Institute of Surgery

- Analysis of medical articles dealing with the application of various techniques in conducting abdominal surgery

- The survey of the leading surgeons performing abdominal operations
The results of the analysis of RAO performed in Institute of surgery

- **Hypothesis 1** - the specifics of a patient, the diagnosis and pending operation should be taken into account;

- **Hypothesis 2** - low injury level (mini-invasiveness) and high level of precision

- **Hypothesis 3** - small neoplasms and localization of pathology in hard-to-reach zones

- **Hypothesis 4** - the optimal application zone for robot assisted surgery is determined by technological, financial, economic, and organizational aspects
Analysis of medical articles

**Content analysis (CA)** developed by the American scholars H.Lasswell and B.Berelson

The principal characteristic features:

- a clearly defined system of goals, which as a rule, does not concur with the goals of the authors of materials analyzed;

- predominant use of qualitative, specifically, textual information in the analysis, not quantitative data;

- possibility in conducting a survey to unify the works of different authors, their opinions and expertise.
Content analysis

Information base of the survey

2003-2013
344 clinical cases
130 specialists
Content analysis

Age: 25-85 years (59.8)

Localization (95.9%)
- Front segments 26.5%
- Back segments 73.5%

Size (79.4%)
- Less than 10 cm - 90.5%
- 10 cm - 9.2%
- More than 10 cm - 0.3%
The operation

- Anatomic resections 42.2%
- Right hemigepatectomy 19.5%
- Left hemigepatectomy 8.3%
- Resection of the past segments 10.4%
- Resection of the front segments 19.5%

The duration of operation
26-812 min. (278 min.)
1 - the number of postoperative complications depending on number of procedures;
2 - the average number of complications;
3 - the number of higher complexity procedures.
The survey of the leading surgeons performing abdominal operations
Thank you!