



THE SURGERY OF THE FUTURE IS HERE: CAPABILITIES OF THE DA VINCI SURGICAL SYSTEM

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Article history:	Abstract:
Received: 20 th February 2026 Accepted: 14 th March 2026	This article examines the development of modern surgery, focusing on the implementation of the robotic Da Vinci Surgical System. Its key advantages are highlighted: high precision, minimal invasiveness, reduced complications, and accelerated patient recovery. The operating principles of the technology and prospects for its further development, including the integration of artificial intelligence, are briefly described. A conclusion is drawn regarding the significant role of robotic surgery in shaping the medicine of the future.
Keywords: Robotic surgery, Da Vinci Surgical System, minimally invasive surgery, innovative technologies, telemanipulation, 3D visualization, surgery of the future	

INTRODUCTION:

Modern medicine is rapidly evolving, integrating innovative technologies aimed at improving the accuracy, safety, and effectiveness of treatment. One of the most significant achievements of recent decades has been the emergence of robot-assisted surgical systems, among which the Da Vinci Surgical System holds a special place. This technology has opened new possibilities for performing complex surgical procedures with minimal tissue trauma and improved clinical outcomes. [1]

Traditional surgical methods, despite their effectiveness, have several limitations related to the human factor, restricted instrument mobility, and the risk of postoperative complications. In contrast, robotic systems significantly expand the surgeon's capabilities through enhanced precision of movements, three-dimensional visualization of the surgical field, and elimination of physiological hand tremor. This is especially important in minimally invasive procedures, where maximum accuracy and control are required. [2] The Da Vinci Surgical System is already widely used in various medical fields, including urology, gynecology, cardiac surgery, and general surgery. Its implementation contributes to reduced hospital stay, decreased pain syndrome, and faster patient recovery. [3]

Thus, robot-assisted surgery represents an important stage in the evolution of medical science and practice, forming the foundation for the further development of high-tech medicine. Studying the capabilities and prospects of the Da Vinci Surgical System is a relevant task in modern surgery and opens new horizons in patient treatment. [4]

OBJECTIVE:

To study the capabilities and clinical significance of the robot-assisted surgical system Da Vinci Surgical System, as well as to assess its role in improving the efficiency, safety, and quality of surgical interventions at the current stage of medical development.

MATERIALS AND METHODS:

The study was conducted at Shox International Hospital and had a clinical-analytical design.

Materials:

The study included patients who underwent surgical interventions using the Da Vinci Surgical System. The following data were analyzed:

- patients' medical records;
- results of preoperative and postoperative examinations;
- intraoperative data;
- indicators of postoperative recovery (length of hospital stay, severity of pain syndrome, presence of complications).

METHODS:

The following methods were used in the study:

- clinical analysis of treatment outcomes;
- comparative analysis (when available — comparison with traditional or laparoscopic procedures);
- statistical processing of the obtained data;
- descriptive method to evaluate the effectiveness of the Da Vinci Surgical System.

RESULTS:

The study conducted at Shox International Hospital demonstrated that the use of the Da Vinci Surgical System ensures high precision in surgical interventions and reduces tissue trauma.



The postoperative period was favorable in patients: a reduction in pain syndrome and shorter hospital stay were observed. No intraoperative complications were reported.

Thus, robot-assisted surgery demonstrates high efficiency and safety, improving clinical treatment outcomes.

Statistics of Performed Surgeries:

General surgery	54,9%
Urology	33,0%
Otolaryngology	7,0%
Gynecology	3,2%
Thoracic surgery	1,5%
Cardiac surgery	Less than 1%

Comparison of Patients Operated Using the Da Vinci Surgical System and Traditional Surgery:

	Robot-assisted surgery	Traditional surgery
Average blood loss	120 ml	350 ml
Postoperative complications	3%	12%
Length of hospital stay	2-5 days	5-7 days
Pain intensity (1-10)	2/10	5/10
Full recovery	92%	75%

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CONCLUSION (FINDINGS):

The use of the Da Vinci Surgical System reduces tissue trauma, shortens hospital stay, decreases the risk of complications, and accelerates recovery compared to traditional surgery.

Final Conclusion:

The results of the study demonstrate that robot-assisted surgery using the Da Vinci Surgical System ensures high precision of surgical procedures, reduces tissue trauma, and lowers the rate of postoperative complications.

Patients recover faster, with a reduction in both the length of hospital stay and the severity of postoperative pain compared to traditional surgical methods.

Thus, the Da Vinci Surgical System represents a significant stage in the evolution of surgery, opening new opportunities for safe and effective treatment and forming the foundation of future high-tech medicine.

REFERENCES