



Robotic Surgery

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December 9, 2020

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Introduction

The use of robots is rapidly increasing with a market growth worldwide from less than 5 billion in 2000 to an expected 25 billion in 2010.¹ Robotic technology offers the unique opportunity to control the operational process outside the actual location, with the skilled and often expert operators not necessarily being physically present.

Robotics in surgery:

- Urology

Radical prostatectomy has been the fastest growing application of robotic surgery in urology and becoming standard procedure in many centres in the United States.¹

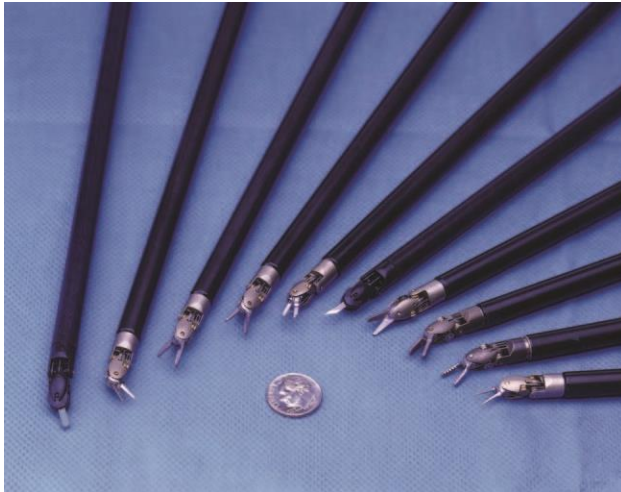


Figure 1. EndoWrist instruments belonging to the da Vinci Robotic system (²[2008] Intuitive Surgical, Inc.).

- **Reproductive surgery**

Although this microsurgical operation seems to suit the features of robotic surgery, there is not much literature available.

- **General surgery**

Robotic general surgery include cholecystectomies, gastric bypass surgery,².

Cost-effectiveness

An important issue in robotic surgery are the higher costs compared with regular surgery.

Training and education in robotics

With the implementation of robot-assisted laparoscopic surgery, there is also an increasing need for training. Conventional laparoscopic surgery requires different skills and training compared with open surgery. Basic laparoscopic skills can be obtained in a box trainer, in a cadaver or with virtual reality.³.

Litigation and ethical issues

The increasing complexity of modern surgical technology will require more stringent guidelines for operation and practice similar to the discipline exercised in aviation. Using a surgical robot implies that the surgeon is no longer in direct physical or visual contact with the patient.

Pros and cons

The robotic surgical system has some clear advantages compared with conventional laparoscopy. A summary of the advantages and disadvantages of robot-assisted laparoscopic surgery is given in Table 1.

Table 1. Advantages and disadvantages of robotic surgery

Advantage	Disadvantage
Surgical system advantages	High costs
Better InSite vision (3D)	Robotic system
Digital camera zoom	Maintenance system
Camera stability	
Greater dof (Endowrist)	Bulky size of the robotic system
Improved dexterity	Sometimes difficult access to patient
	Separation surgeon from the operating field
Elimination of fulcrum effect	No tactile feedback
Better ergonomics for surgeon	
Motion scaling	Chance of breakdown
Elimination of physiological hand tremor	Use of 8 mm ports
Telesurgery possible	Monopoly of single market leader
Telementoring possible	

Keywords

Gynaecology, robotics, robotic surgery, training, surgery, robots.

References

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