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LETTER TO THE EDITOR

The use of da Vinci Xi and the increased surgeon's experience could change the perspective over the cost–benefit ratio of robot-assisted surgery

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To the Editor:

We read with great interest the article by Khorgami et al. entitled "The cost of robotics: an analysis of the added costs of robotic-assisted versus laparoscopic surgery using the National Inpatient Sample" [1] recently published on Surgical Endoscopy.

The introduction of robotic systems in surgery was intended to overcome the known limitations of conventional laparoscopic surgery, while preserving the advantages of the minimally invasive surgery [2], justifying the growing interest in robotic technology for abdominal surgery worldwide. However, the costs of robot-assisted surgery (RAS) still represent a critical issue for its widespread adoption.

The study of Khorgami et al. is a very well structured retrospective analysis of the 2012–2014 Healthcare Cost and Utilization Project-National Inpatient Sample which is the largest inpatient health care database in the United States, collecting data from more than 7 million hospital admissions annually. A total of 91,630 abdominal major and minor surgeries (87,965 laparoscopic, 3665 robotic) were analyzed, including cholecystectomy, ventral hernia repair, right and left hemicolectomy, sigmoidectomy, abdominoperineal resection, and total abdominal hysterectomy. The average cost for the laparoscopic group was \$10,227 ± \$4986 versus \$12,340 ± \$5880 for the robotic cases ($p < 0.001$), suggesting that RAS is more costly when compared to conventional laparoscopic surgery. However, robotic total abdominal hysterectomy showed the lowest increased cost and was the only procedure to be performed more often robotically. This suggests that although RAS costs are higher, the difference may be offset with more routine performance of procedures using the robot.

Some recent published studies of our group on rectal surgery [3, 4] support this theory, showing a significant decrease of RAS overall variable costs with surgeon's experience. This means that a possible major bias of the current economic evaluations such as those of this article, unfavorable to RAS when compared to standard laparoscopy, is that they are referred mainly to results obtained by comparing expert laparoscopists with novice robotic surgeons.

A second possible bias is that the study of Khorgami et al. refers to the years 2012–2014, when the new da Vinci Xi robotic platform was not available yet. Indeed, recent works have reported that the use of the new da Vinci Xi represents an improvement on its Si predecessor in robot-assisted colorectal resections, being associated with shorter operative time, reduced docking time and higher full robotic resection rates and significantly reducing RAS-associated costs [3–5].

In conclusion, the article by Khorgami et al. deals with a very interesting topic analyzing a huge sample size. However, the use of the new da Vinci Xi platform, as well as of new robots, by robotic surgeons with an adequate experience could nowadays change the perspective over the cost–benefit ratio of RAS.

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Compliance with ethical standards

Conflict of interest Dr. Desirée Gianardi, Dr. Matteo Palmeri and Prof. Luca Morelli have no conflicts of interest or financial ties to disclose.

Research involving human participants and/or animals This article does not contain any studies with human participants or animals.

Informed consent For this type of study informed consent is not required.

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