Summary of “Current Status of Robotics in General Surgery”

L. William Traverso, M.D.

The invited speakers overall believed that robotics provided technical advances for operations to treat gastrointestinal diseases. This developing technology requires a close collaboration between engineers and surgeons to utilize this modern machinery, but in a way that is cost-effective for our health care system.

Currently there are but a few gastrointestinal operations where the robotic technology has allowed surgeons to provide better operations. A good example is the Heller myotomy, with the virtual elimination of esophageal perforations. The robot was designed to work through laparoscopic trocars. However, this does not mean that the advantages of this technology could not be used during open procedures. An example was the reconstruction of the tiny pancreatic duct to the jejunum during reconstruction after pancreaticoduodenectomy.

The robot offers the surgeon the following advantages: instant ambidexterity, much greater magnification than surgical loupes, reclaiming additional movement (wrist action), and the ability to tie sutures with only several inches of suture material. The downside of the technology includes the following: the lack of haptic feedback to tie sutures without breaking them (the robot is very strong and can break even a

2-0 suture with ease), the bulkiness of the equipment hinders access to the patient by the anesthesiologist, and a surgical assistant that is at the patient's side among the arms of the robot. Another limitation is that the operation must be performed in a small area of the abdomen because moving the instrument arms from the upper to the lower abdomen is currently impossible.

Therefore a good example of a great application is exemplified by the Heller myotomy—fine movement in a confined space under greater magnification with minimal chance of esophageal perforation.

Discussion from the audience following the lectures was interesting. In addition to assessing the robot as allowing a surgical procedure, it was suggested that the robot could be used to record the performance of the surgeon. The new robotic technology could be looked on as a “source of information” on surgical ability. Finally, it was noted that residents in training, although enamored of any new technology, have very little “hands-on” learning opportunity. There is only room for one surgeon at the control station. A resident's discomfort with this new technology is best exemplified by a new term. Because the surgeon is remote from the patient, the new term for the assistant is the “patient-side assistant.”

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From the Department of General Surgery (L.W.T.), Virginia Mason Medical Center, Seattle, Washington.

Correspondence: L. William Traverso, M.D., Virginia Mason Medical Center, 1100 Ninth Ave., C6-SUR, Seattle, WA 98101.