International Journal of Swarm Intelligence and Evolutionary Computation

OPEN ACCESS Freely available online

Editorial

Robot Assisted Surgery and Uses

Chanel Bhatter*

Department Engineering, K.N.Toosi University of Technology, Tehran, Iran

DESCRIPTION

Robotic surgery is types of surgical procedures that are done using robotic systems. Robotically-assisted surgery was developed to try to overcome the limitations of pre-existing minimally-invasive surgical procedures and to enhance the capabilities of surgeons performing open surgery.

In the case of robotically-assisted minimally-invasive surgery, instead of directly moving the instruments, the surgeon uses one of two methods to administer the instruments. These include using a direct telemanipulator or through computer control. A telemanipulator is a remote manipulator that allows the surgeon to perform the normal movements associated with the surgery. The robotic arms carry out those movements using end-effectors and manipulators to perform the actual surgery. In computer-controlled systems, the surgeon uses a computer to control the robotic arms and its end-effectors, though these systems can also still use telemanipulators for their input. One advantage of using the computerized method is that the surgeon does not have to be present, leading to the possibility for remote surgery.

Robotic surgery has been criticized for its expense, with the average costs in 2007 ranging from $5,607 to $45,914 per patient. This technique has not been approved for cancer surgery as of 2019 as the safety and usefulness is unclear.

USES

Thoracic

Robotic surgery has become more widespread in thoracic surgery for mediastinal pathologies, pulmonary pathologies and more recently complex esophageal surgery. The da Vinci Xi system is used for lung and mediastinal mass resection. This minimally invasive approach as a comparable alternative to video-assisted thoracoscopic surgery (VATS) and the standard open thoracic surgery. Although VATS is the less expensive option, the robotic-assisted approach offers benefits such as 3D visualizations with seven degrees of freedom and improved dexterity while having equivalent perioperative outcomes.

Gynecology

The first report of robotic surgery in gynecology was published in 1999 from the Cleveland Clinic the adoption of robotic surgery has contributed to the increase in minimally invasive surgery for gynecologic disease. Gynecologic procedures may take longer with robot-assisted surgery and the rate of complications may be higher, but there are not enough high-quality studies to know at the present time. In the United States, robotic-assisted hysterectomy for benign conditions was shown to be more expensive than conventional laparoscopic hysterectomy in 2015, with no difference in overall rates of complications.

This includes the use of the da Vinci surgical system in benign gynecology and gynecologic oncology. Robotic surgery can be used to treat fibroids, abnormal periods, endometriosis, ovarian tumors, uterine prolapse, and female cancers. Using the robotic system, gynecologists can perform hysterectomies, myomectomies, and lymph node biopsies. The Memic robotic system is aimed to provide a robotic platform for natural orifice transluminal endoscopic surgery for myomectomy through the vagina.

Spine

Robotic devices started to be used in minimally invasive spine surgery starting in the mid-2000s. As of 2014, there were too few randomized clinical trials to judge whether robotic spine surgery is more or less safe than other approaches.

As of 2019, the application of robotics in spine surgery has mainly been limited to pedicle screw insertion for spinal fixation. In addition, the majority of studies on robot-assisted spine surgery have investigated lumbar or lumbosacral vertebrae only. Studies on use of robotics for placing screws in the cervical and thoracic vertebrae are limited.

Transplant surgery

The first fully robotic kidney transplantations were performed in the late 2000s. It may allow kidney transplantations in people who are obese who could not otherwise have the procedure. Weight loss however is the preferred initial effort.

Correspondence to: Chanel Bhatter, Department of Systems and Control Engineering, K.N.Toosi University of Technology, Tehran, Iran, E-mail: Bhatter12@gmail.com

Received date: June 7, 2021; **Accepted date:** June 21, 2021; **Published date:** June 28, 2021

Citation: Bhatter C (2021) Robot Assisted Surgery and Uses. Int J Swarm Evol Comput.10: e222

General surgery

With regards to robotic surgery, this type of procedure is currently best suited for single-quadrant procedures, in which the operations can be performed on any one of the four quadrants of the abdomen. Cost disadvantages are applied with procedures such as a cholecystectomy and fundoplication, but are suitable opportunities for surgeons to advance their robotic surgery skills.