Robotic surgery: A new technology and future advancement.

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Abstract

In general surgery, the use of robotics and laparoscopic surgery is increasing. Robotic surgery, which requires minimal incisions, has advanced rapidly over the years, benefiting both patients and surgeons. Therefore, robotic platforms and tools are now being used and improved more frequently in general surgery. Robotic surgery is advancement on the minimally invasive spectrum and represents an evolution of practice across multiple disciplines. Surgical robotics is a promising new technology. Robotic surgery, often known as the new revolution, is one of the most discussed topics in surgery today. So far, however the willingness to develop and procure robotic devices has been largely driven by the market. It has undoubtedly become an important tool in surgical instruments, but its range of uses is still evolving.

Keywords: Robotic Surgery, Surgical Robots, Technology, Surgical Advances.

Introduction

The human-machine relationship raises various ethical issues that require a more serious evaluation. They were depicted in his sci-fi work of Isaac his Asimov, where robots were part of a tech-savvy and arrogant vision of a future in which robots would be of great help to mankind for generations [1].

Robotic surgery is performed by a surgeon rather than a robot. But instead of the traditional hand tools used in laparoscopic surgery, which involves small incisions or in open surgery, where the surgeon enters the body through large incisions, machines are used by doctors. The surgeon uses joysticks and foot switches to remotely control the machine's tools while viewing the surgical site on a high-definition monitor that provides a three-dimensional view of the surgery. Some surgeons believe these robots will improve precision during surgery, reduce recovery time and generally improve clinical outcomes for patients. However, in this review, a comparison of robotic and traditional methods showed that in many respects they were very similar [2].

In robotic surgery, the lack of force feedback makes it difficult for surgeons to maintain precise control without damaging tissue. Based on extensive experience in minimally invasive surgery, researchers at Central South University Xiangya Third Hospital have created a categorical database of patient physical characteristics, the interaction of surgical instruments with human soft tissue and the operator-instrument interface. The design criteria for surgical robots were established based on a careful study of this data, which was also reflected in the product safety and reliability rating system. These guidelines have produced designs that ensure clinical safety and efficacy while improving ease of use [3].

Although robotic surgery offers many advantages over traditional open surgery, surgeons face increased cognitive load during robotic surgery. There are visuospatial challenges for trainees that complicate the learning process. Another challenge trainee's face is the time constraint to use real robotic systems, such as the Da Vinci Her Robot, for training. These expensive systems are required for surgery and are often used in hospitals by advanced surgeons. This makes it difficult for students to gain experience with robotic surgical systems. A cost-effective robotic surgical training system was developed to meet these challenges [4].

Robotic surgery is still in its infancy, but it has already proven to be of great value, especially in areas inaccessible to conventional laparoscopic surgery. However, it remains to be seen whether robotic systems will replace traditional laparoscopy instrumentation for a less technically demanding procedure. In any case, robotic technology will revolutionize surgery by improving and expanding laparoscopic surgery, advancing surgical techniques and moving surgery into the digital age. Moreover, it has the potential to extend surgical treatments beyond the limits of human capabilities [5].

Conclusion

In a rapidly growing and dynamic research and development environment, the purpose of this review is to examine current and emerging robotic surgical technologies. Future advances in robotics will primarily focus on haptic and kinesthetic input, miniaturization, micro robotics, greater detail and augmented visual feedback and long-lived haptic systems that enable autonomous robots. Guess we recommend developing structured training courses with benchmarks for success and evidence-based training strategies. This typically includes incremental progress starting with observation, case assistance

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in programming and operating surgical instruments, learning fundamentals of robotics in dry and wet lab environments, individual, team and supervised non-technical skills. Mastery includes modular console training. Basic robotics skills and procedural activities as part of robotic surgery education must be safely and effectively performed before independent practice. We recommend using performance indicators and research-based teaching techniques to create a structured training program.

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