Editorial

ROBOTIC SURGERY - ECONOMIC IMPACT IN UNDERDEVELOPED COUNTRIES

Binafsha Manzoor Syed
Medical Research Center, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan

Correspondence:
Binafsha Manzoor Syed,
Medical Research Centre, Liaquat University of Medical & Health Sciences, Jamshoro, Pakistan
Email: binafsha.syed@lumhs.edu.pk

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ABSTRACT
Robotic surgery also known as robot-assisted surgery is a type of minimally invasive surgery, which uses high technology computer system for surgical procedures. The robotic surgery is associated with high range of motion leading to high visibility resulting in low rate of per-operative complications and shorter hospital stay. Though it shows high success rate with low rate of complications but the cost of the robotic system and recurring cost is a challenge. The developing countries where basic health facilities are a challenge for government, installation of such high technology system may appear fancy without any great community benefit.

Key Words: Robotic surgery, Minimal invasive surgery, low middle income countries

INTRODUCTION

Robotic surgery, also known as robot-assisted surgery, is a type of minimally invasive surgery that utilizes robotic system to assist surgeons in performing surgical procedures. The primary goal of robotic surgery is to enhance the capabilities of surgeons, increased precision, flexibility, and control as compared to traditional surgical approaches.

The robotic surgery fundamentally involves use of a Robotic Surgical System, which typically consists of a console where the surgeon sits, a patient-side cart with robotic arms, and a high-definition 3D vision system. The surgeon controls the robotic arms from the console, manipulating specialized instruments with precision. The robotic arms hold and manipulate surgical instruments. These arms can mimic the hand movements of the surgeon in the conventional system with a high degree of precision and a range of motion. Specialized instruments are attached to the robotic arms. These instruments can be interchangeable and tailored for different types of surgeries. The commonly used tools include those used for cutting, suturing, and cauterizing tissues. The system also provides the surgeon with a high definition three-dimensional view of the surgical site. This enhanced visualization helps the surgeon to navigate complex anatomical structures with greater accuracy, thus reducing the risk of per-operative complications.

BENEFITS OF ROBOTIC SURGERY

The robotic system allows for precise movements with reduced hand tremors, enabling delicate procedures in confined spaces. Robotic surgery is often performed through small incisions, leading to less scarring, reduced pain, and faster recovery as compared to conventional open surgery. The 3D vision system provides a detailed view of the surgical site, allowing for better identification of structures and improved decision-making. Thus in general lesser risk of damage to the surrounding structures. It can be used for a wide range of procedure including but not limited to urological, gynaecological and biliary surgeries.

LIMITATIONS OF ROBOTIC SURGERY

As mentioned earlier robotic surgery has many benefits but it is also associated with a number of limitations, where the cost of equipment and the need for specialized trained staff to operate the robotic system are the major challenges. The equipment installation involves huge amount of investment, then there is the maintenance cost further adds to the recurring cost. Moreover, the trained staff can manage the equipment properly otherwise mishandling of the system can lead to further cost of repair and potential harm to the patient.

ECONOMIC IMPACT OF ROBOTIC SURGERY IN UNDERDEVELOPED COUNTRIES

The economic impact of robotic surgery in underdeveloped countries is a complex and multifaceted issue. While robotic surgery offers potential benefits, it also comes with challenges that may limit its widespread adoption in resource-constrained settings. On one hand shorter hospital stay, fewer complications and faster recovery save cost of each surgical procedure. The high initial cost is a significant barrier for underdeveloped countries with limited healthcare budgets. In addition training healthcare professionals to use and maintain the technology can be resource-intensive and may be challenging in regions with limited access to education and training facilities. From perspective of Pakistan, where there are limitations of infrastructure and basic healthcare facilities in many regions, installation of robotic surgery would not be a great idea to handle. As the system required constant power supply and high speed internet which is again a challenge in limited resource countries. In limited resource countries it raises an ethical issue for the decision makers that where they prioritize primary and basic health care system to improve needs such as immunization, maternal care, and infectious disease control, then investing in advanced surgical technology. One the other hand developing countries may attract patients from other regions seeking advanced medical treatments. This could potentially boost the healthcare sector and generate revenue. The implementation of robotic surgery may create job opportunities in various sectors, including healthcare, technology, and support services. This could have a positive impact on employment rates. Collaborations with international manufacturers of robotic surgical systems could facilitate technology transfer and promote innovation within the country. This, in turn, may boost the technological sector and foster research and development.

CONCLUSION

In summary, it is multifactorial to make a decision of introducing robotic surgery in a limited resource country where risk and benefits may be compared with great care. However, it may further compromise the budget spent on provision of basic health facilities. Thus may raise an ethical issue.