PriMera Scientific Surgical
Research and Practice
Volume 1 Issue 5 May 2023
ISSN: 2836-0028

PriMera Scientific Publications

Telesurgery in Developing Countries

Type: Editorial
Received: March 16, 2023
Published: April 18, 2023

Citation:
Sie Thu Myint., et al. "Telesurgery in Developing Countries". PriMera Scientific Surgical Research and Practice 1.5 (2023): 01-02.

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Telesurgery uses wireless networking and robotic technology to allow surgeons to operate on patients who are distantly located. This technology not only benefits today's shortage of surgeons, but it also eliminates geographical barriers that prevent timely and high-quality surgical intervention, financial burden, complications, and often risky long-distance travel [1].

Benefits of remote robot-assisted surgery are multiple. Geographic constraints will no longer determine the type of treatment the patient receives because of lack of surgical expertise. Ideally, any patient can receive the form of treatment more appropriate for his or her condition or more advantageous, such as new minimally invasive techniques. This may have an even more profound impact on developing countries, where healthcare is often provided by volunteers who do not necessarily have expertise in all fields of medicine and surgery [2].

Telemedicine is now widely used in surgery from performing operations to teaching and can be divided into three main components; telesurgery, tele-mentoring and teleconsultation. Developments across these fields have led to remarkable achievements such as intercontinental telesurgery and tele-mentoring [3].

Due to the limitation of special regions and unbalanced development of medical technology, many patients lost the best opportunity for operation. The idea of telesurgery robot was proposed for the first time to quickly and safely treat trauma patients in the rear hospital in the wartime. With the development of medical and remote communication technology, the demand of telesurgery has increased. Laparoscopic and endoscopic technology changed the previous operation mode that operated under direct vision. By presenting the operation vision through video images, tele-present surgery came into reality, and it was early used for remote surgery guidance and education of complex operation and emergency trauma cases [4].

Patients far away from hospital, can consult with their doctors easily with teleconsultation and can reduce the number of hospital visits. Patients can have teleconsultation for follow-up.

During the covid error, surgeons need to take care of surgical patients, and operate on covid-positive patients. Surgeons also take care of covid-positive non-surgical patients as the medical staffs are not enough to take care of the rising number of patients. Health-care personnel have to attend

patients both personally and on-line. Many patients consult with medical professionals via tele-consultation, video-calling by using viber, messenger, etc...

Doctors with busy schedule can have multidisciplinary meeting via online. Doctors perform continue medical educations in the form of webinars.

Surgeons can also use video-calling to discuss about the patients during ward-round and also during operation. Surgeons from different places can collaborate without long travel.

Surgeons can perform surgery and broadcast so that doctors from remote areas can view the live surgery on-line and can do questions and answers in real time.

Senior surgeons can supervise the operations of juniors by video-call. Seniors can see both the intraoperative findings and the skills and handicrafts of juniors. Seniors can also do the tele-mentoring.

There are many advances and benefits, due to improvement of communication media.

The biggest challenge of telepresence system at present is not to compromise the optimal balance of remote operation process due to excessive occupancy of available bandwidth when meeting the quality requirement of real-time medical image and video [4].

Telesurgery benefits not only the developed countries but also the low and middle-income countries by facilitating in the areas of patient consultation, pre-operative preparation, operation and follow-up. It also aids in training of juniors, supervision of juniors, mentoring the juniors and collaboration between doctors. Doctors should make the best use of telesurgery to get quality care in medical practice.

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