

TRENDS IN THE DEVELOPMENT OF HIGHER MEDICAL EDUCATION THROUGH THE INTRODUCTION OF DIGITAL ONLINE CONSULTATIONS IN SURGERY

Ulugbek K. Kasimov¹, Fayzrakhmon M. Abdurakhmanov²,
Azam R. Bobobekov³, Diyora U. Sultanova⁴

1 PhD, Assistant Professor, the Department of General and Pediatric Surgery №1,
Tashkent Medical Academy, Tashkent, Uzbekistan
E-mail: kas-ulug@mail.ru

2 Assistant, the Department of General and Pediatric Surgery №1,
Tashkent Medical Academy, Tashkent, Uzbekistan
E-mail: sardorruss@mail.ru

3 Senior Lecturer, the Department of General and Pediatric Surgery №1,
Tashkent Medical Academy, Tashkent, Uzbekistan
E-mail: azam1963@mail.ru

4 Student at the Tashkent Medical Academy, Tashkent, Uzbekistan

ABSTRACT

The digitalization of medicine has been actively introduced into medicine in recent decades. Telemedicine is a variation of this area. It has prospects in the form of conducting various online consultations of specialists in all corners of our Republic, when the use of electronic information, integrated digital and telecommunication technologies creates conditions for the exchange of data between doctors, as well as for management in the field of medical education and healthcare. With the help of telemedicine technology, doctors can urgently consult with each other. In serious cases, doctors themselves sometimes need the help of a more qualified specialist. If there is no such thing nearby (for example, if we are talking about remote medical institutions), then the only way out is a video call to an experienced colleague. Doctors can also send patient data to each other to view their medical history. Live broadcasts of surgical operations, during which doctors and students can ask their questions, which will qualitatively improve the educational process.

Key words: telemedicine, surgery, information technology.

INTRODUCTION

Digitalization is being introduced widely into all areas of health care, and telemedicine was the first of its kind. Despite the common perception that

telemedicine is young and not yet common in practice, it began long before the computer, in the days of the telegraph. Consultations with specialists by phone can also be classified as telemedicine. At the same time, the first videoconferencing session as a telemedicine tool was conducted in 1965. It was a broadcast of an aortic valve replacement operation on an artificial heart assisted by the eminent cardiac surgeon Michael DeBakey [2,5].

Since the 1960s there has been a significant increase in the use of videoconferencing amongst medical personnel including surgeons [7]. In recent years, the cost of equipment for this has become cheaper and high technical skills are not required to use the system. In 2004, the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) introduced its definitions of telemedicine [8]. Videoconferencing is defined as a real-time, interactive programme in which one group of participants is at one or more locations and another group of participants is at another location. Videoconferencing permits interaction, including audio and/or video, and possibly in other ways, between at least two specialists [8]. A similar definition is used in Telemedicine Journal and e-Health [3].

The US Department of Health and Human Services defines telehealth as "the use of electronic information and telecommunication technologies to support and promote clinical care at a distance, patient education and professional medical education, public health and health care management" [4]. The Agency for Healthcare Research and Quality classifies telemedicine into 3 separate categories:

1. real-time telemedicine between patient and health care provider;
2. storing and forwarding telemedicine services, such as the exchange of medical images or data between service providers;
3. telehealth home monitoring, involving the use of telehealth to remotely monitor patients and their health status, also known as remote patient monitoring [4].

The greatest concern in the current pandemic is the enormous workload, psychological stress, emergencies and, even worse, transmission among health-care workers. As of 8 May 2020, 90 000 health workers were infected with the severe disease COVID-19 and many countries have reported a large number of deaths of health workers [13]. One potentially useful tool to reduce the aforementioned risks to the health system is the digitalization of medicine. Many surgical pathologies are known to have negative outcomes due to delayed treatment, leading to worse outcomes and increased patient mortality [3, 9].

Education and training is an important aspect of the practice of the academic surgeon. Residency training is hampered by reduced operating room hours, patients in clinics, and individual surgical training. Virtual learning environments via

videoconferencing have been used successfully for training trainees and students, as well as for tele-rehabilitation [10]. Distance learning is considered to be as effective as traditional instructor-led methods [11]. This method of teaching provides theoretical knowledge, but does not allow residents and medical students to acquire technical and surgical skills. Virtual patient cases have been studied as a substitute option for some patient meetings, and they have shown a moderate improvement in knowledge and appear to be useful for preparing or reinforcing face-to-face patient meetings [12].

A unified communication and information service for emergency medical care, comprising several levels and structural components, has been set up in the Republic. Transforming primary health care for the population, developing an emergency medical service and ensuring access to highly specialized medical care for the population remain priorities in the reform of the health-care system.

This service aims to provide the population with qualified specialized, high-tech emergency, urgent and emergency care, to organize a system of emergency medical care in line with international standards and to establish close cooperation with foreign specialized institutions. It is here that the implementation of digitalization for accessibility of medical services and training is relevant [6].

Air ambulance is one of the structures of emergency services, particularly surgery, where specialists need help in solving difficult and controversial clinical cases in a collegial way. Of course, this emergency service is relevant in all branches of modern health care, but when it comes to the economic efficiency of this service, here it is necessary to modernize it by implementing digitalization in the air ambulance service.

Material and methods. We analyzed the calls of employees of Department of general and pediatric surgery #1, based in department of purulent surgery and surgical complications of diabetes mellitus of multidisciplinary clinic of TMA in the year of 2020. A total of 109 patients were consulted, of whom the main contingent was 88 patients in whom surgical infection developed against the background of diabetes mellitus, less frequent were 16 patients with lung suppurative diseases and 9 patients with surgical soft tissue infections.

Table 1

Distribution of patients by nosology

Nosology	Amount	
	n	%
Acute purulent-destructive lung diseases	16	14,7
Soft tissue infections	9	8,3
Soft tissue infections due to diabetes mellitus	40	36,7
Diabetic gangrene of the lower limbs	44	40,3
	109	100

Results.

An analysis of the distribution of patients by regions of the Republic showed that patients from Tashkent and Tashkent province were consulted, patients from other provinces were consulted less frequently, while the number of patients with surgical infections in the regions of the Republic remained at a high level.

Table 2**Distribution of patients by regions of the Republic**

Provinces	Number of calls	(%)
Tashkent city	55	50,5
Tashkent	24	22,1
Syrdarya	8	7,4
Jizzakh	7	6,4
Namangan	5	4,6
Andijan	2	1,8
Bukhara	1	0,9
Navoiy	3	2,7
The Republic of Karakalpakstan	2	1,8
Samarkand	2	1,8
Total	109	100

In reviewing the care provided to these patients, it was found that in 88.9% of cases the conservative treatment was corrected or the patients were subsequently transferred to our department and only 12 patients underwent surgery locally.

Table 2**Volume of care provided**

Provinces	Correction of treatment	%	Operation	(%)
Tashkent city	52	47,8	3	2,7
Tashkent	19	17,4	5	4,6
Syrdarya	8	7,5	-	
Jizzakh	7	6,5	-	
Namangan	3	2,7	2	1,8
Andijan	2	1,8	-	
Bukhara	1	0,9	-	
Navoiy	3	2,7	-	
The Republic of Karakalpakstan	1	0,9	1	0,9
Samarkand	1	0,9	1	0,9
Total	97	89,1	12	10,9

Discussion.

To call a specialist to a distant facility requires the involvement of many specialists, in particular the consultant, dispatcher, driver and their financial incentives accordingly. Of course, if it is necessary and possible to carry out various types of surgical interventions on site, visiting of specialists is obligatory. But, today, the question is about the accessibility of specialists at all levels locally in the early stages of the disease, and here the main role is assigned to the digitalization. There are situations where doctors need help, because severe and complex cases are everywhere. At the same time, transporting the patient to a clinic in the capital or to a medical centre is not possible or not reasonable. The only option is an urgent video call, which can help you get the advice you need as quickly as possible, avoiding valuable time being wasted.

Digitization in this area allows trainees to see clinical situations clearly and to analyse complex cases together so that they can actually follow the patient's treatment online. In contrast to watching video recordings, the trainees can ask questions and receive detailed explanations, and can analyze difficult situations. In addition, it can display all of the patient's data, from clinical and laboratory tests to complex instrumental studies, which enables data transfer at any distance, long-term preservation and eliminates the paperwork that is ubiquitous today.

Conclusions.

Thus, the relevance of the emergency medical service and its structural subdivision - air ambulance - is beyond doubt, but there is a need for widespread implementation of digitalization in the form of preliminary online consultations, where all patient data and treatment performed will be demonstrated. This requires the improvement of the digital base and the involvement of specialist engineers who will create the software for the service. The special features of this digitalization are urgency, unlimited number of consultants, with consilium, accessibility and high cost-effectiveness.

REFERENCES

1. Agency for medical research and quality health information technology. 2017. [2017-01-07].<https://healthit.ahrq.gov/key-topics/telehealth>;
2. Bashshur R.L., Sanders J.H., and Shannon G.W. (eds.) Telemedicine: Theory and Practice. Springfield: Charles C. Thomas, Publisher, Ltd., 1997. DeBakey M. Telemedicine has now come of age // Telemedicine Journal.-1995.-Vol.1, N1.
3. COVID Surg Collaborative. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery

plans. *Br J Surg.* 2020 Oct;107(11):1440-1449. doi: 10.1002/bjs.11746. Epub 2020 Jun 13. PMID: 32395848; PMCID: PMC7272903.

4. Healthcare resource and service management telemedicine programs. 2015. [2017-01-03] <https://www.hrsa.gov/ruralhealth/telehealth/> website

5. <https://link.springer.com/article/10.1007/s00268-009-0036-0/ref-CR2>

6. <https://mineconomy.uz/ru/info/1631>

7. Jarvis-Selinger S., Chan E., Payne R., Plohman K., Ho K. (2008) Clinical telemedicine by discipline: lessons learned. *Telemed J E Health* 14:720-725.

8. S.A.G.E.S Society of American Gastrointestinal and Endoscopic Surgeons (January 2009) Surgical practice guidelines for telemedicine; practice/clinical guidelines. <http://www.sages.org/publication/id/21>

9. Shin D.W., Cho J., Kim S.Y., Guallar E., Hwang S.S., Cho B., Oh J.H., Jung K.W., Seo H.G., Park J.H. *Ann Surg Oncol.* 2013 Aug; 20(8): 2468-76.

10. The impact of e-learning on medical education. Ruiz JG, Minzer MJ, Leipzig, RM *Acad Med.* 2006 Mar; 81(3): 207-12.

11. Videoconferencing for distance learning in orthopedics. Baruffaldi F, Giangiaco L, Paltrinieri A, Tony A *J Telemed Telecare.* 2003; 9 (4): 241-2.

12. Virtual patient case evaluation for diagnostic and management training in internal medicine: a mixed methods study. Jamie S., Wang J.J., Richardson L. *BMC Res Notes.* 5 June 2018; 11 (1): 357.

13. Weide A. Becker Hospital review. 90000 healthcare workers worldwide infected with coronavirus. 8th of May 2020. Available from: <https://www.beckershospitalreview.com/workforce/90-000-healthcare-workers-infected-with-coronavirus-worldwide.html> [as of 23rd of July 2020].