

Dear Sir or Madam,

Thank you very much for your review and the comments, which were very valuable to us for the revision. We have fully revised the text as you have advised and have indicated the issues we addressed with red font in the body of the article. Additionally, we have extended the list of references. The issues are discussed directly in the article, rather than point-by-point discussion.

We hope that the revisions are satisfactory for the acceptance.

Review comments:

This is an introductory paper on an important telemedical use of Telekap. General statements about the utility of the telestroke program were presented. The paper could be strengthened in the following ways: 1. Describe the telestroke system in more details in terms its benefits for diagnosis, treatment, referral, and follow-up of patients. 2. Insert new information about how users' perception of the system. 3. Show how patient outcomes are optimized with the information provided by the telemedical system. 4. Identify the uniqueness of the telestroke system in use. 5. Document if this telemedical system could be replicated in other critical care areas.

Answer: In Slovenia there are two referral tertiary neurosurgical centres for 1.8 million population. Due to the specifics of neurosurgical pathology, the paucity of neurosurgery experts in peripheral emergency departments and the lacking availability of a range of effective treatments there, the patients with corresponding pathology and in need of emergency treatment are transferred for the specialist management to the either centre always when possible. On some occasions, the worsening clinical condition would direct immediate action and preclude the transport. In these sceneries, the Telekap is particularly valuable. Numerous factors have all contributed to optimal conditions for Telekap implementation in Slovenia, including the opportunity to improve access and quality of care, narrow window of

time frame and treatment efficacy, the resources required for ground and helicopter medical transportation and the expansions and improvements of the medical care dedicated information-communication technology. As a result, the Telekap is being used extensively in the national health care and its use is still rising.

On some occasions, the surgeons in local hospitals are capable of exerting and immediate neurosurgical treatment in the patients, that need urgent action and where transport would deteriorate the worsening condition due to the time required for reaching neurosurgical department [11-13]. These are in the most cases the trauma settings with intracranial pressure (ICP) monitor placement and operations where evacuation of acute blood is needed from the brain in order to prevent a high rise of ICP and brain herniation. In such cases, only immediate surgical decompression can save the patient [14-16]. Mostly these emergency procedures in Slovenia are connected with acute subdural, epidural and rare superficial intracerebral hematomas and decompressive craniectomies as well as when there are difficulties encountered with the subsequent postemergency neurosurgical care.

The Telekap has been designed to provide any patient with symptoms and signs consistent with acute neurosurgical pathology a quick expert clinical evaluation, a review of diagnostic findings, a diagnosis, decision making, emergency treatment recommendations and postoperative advice. It is the most reasonable to perform the Telekap consultation in collaboration with the treating physicians and nurses, as they are the ones that know the patient's condition in details.

The Telekap can be used regardless of the hospital location, emergency department versus other unit, time of day, and proximity to the nearest neurosurgical centre.

The process is still ongoing and we are expected further expansion, modifications of the system and its improvements in the following years.

Decision making is a central function of a telestroke network. In hospitals without neurosurgical experience and neurocritical care units, the surgeon on call may perform the initial intervention. In such typical neurosurgical setting taking part in the Telekap service, medical consultations are delivered to local hospitals from specialists in the referral centre who are located at distant sites and they have

unusually no connection with the patients and their treatments in the local hospitals. The referral centre is frequently an academic medical centre and provides the neurosurgical Telekap services to distant sites within its geographic region. The most numerous emergencies are those related to the high ICP for various reasons. It is essentially to release this high ICP in order to assure the best possible recovery for the patient. With the Telekap network, the operating surgeon in a distant hospital may sometime be guided with the audio-video support of a neurosurgeon. Late on, when the decompression is achieved, the ICP rescued and the patient stable, a transport into the tertiary centre, may be organised in order to completely accomplish the surgical procedure. In case the patient requires a higher level of care following the Telestroke evaluation, a transfer to the corresponding neurosurgical center is facilitated. When the transfer is indicated, the referral centre typically receives the patient from the local hospital and can provide continuity of care, having already observed the patient virtually. Alternatively, the neurosurgeon may be transferred to the local hospital. In our clinical practice, the latter is a frequent event, where the neurosurgeon may take over the operation in the local hospital in case of difficulties and advises during the immediate postoperative care.

Worldwide, the value of telemedicine has been confirmed clinically and scientifically. In 2009, the American Heart and American Stroke Association reported about the evidence of telemedicine significance in the stroke schemes of care and made recommendations for telestroke implementation [23, 24]. The 2009 policy statement included guidelines with the recommendations that were based on class I evidence [23]. Key recommendations emphasized the value of telestroke system to support the assessment of acute stroke severity, the equivalence to that of a bedside evaluation, the review of imaging results by remotely located stroke specialists and urgent decisions about further treatment [25-27]. In our experience, these evidences may be directly mirrored the neurosurgical practice. The Telekap proved to be an invaluable tool in the management and care of patients, as perceived by the treating surgeons and consulting neurosurgeons in the two Slovenian referral centres. As communicated in the current stroke guidelines, telestroke remains a standard care in hospitals that cannot provide an acute stroke team [25, 28]. In recent years since

implementation of the Telekap in the emergency neurology services, we have successfully broaden its applications also into neurosurgical practice. We may therefore state that in Slovenia the Telekap system has developed in the last three years into a standard and indispensable tool for communication, connection and flow of medical information between the hospitals that cannot provide neurosurgical team and the referral centres. It now remains a standard element of the treatment strategy for neurosurgical patients from distant locations.

The monitoring of the image transmission from primary diagnostic centre (ie. emergency or radiology centre in the local hospital), the flow and quality of video, audio and Internet connectivity should be a part of technology workflow. In order to perform the consultation, surgical and postoperative guidance soundly and to achieve good treatment results, a flawless operation of all systems involved and a good technical support is mandatory [29, 30].

Considering the positive experience, we believe it would be necessary to expand the use of Telekap also to other medical specialities in order to facilitate the flow of important medical and treatment related information. Especially emergency medical services among the hospitals in the country may be connected, including prehospital units, interventional specialities and traumatology, as well as paediatric units and internal medicine emergency services, in order to improve and speed up the management of urgent conditions and to improve treatment outcomes.

Yours sincerely,

Tomaz Velnar