Our experience with telemedicine in traumatology and orthopedics

Ortopedi ve travmatolojide tele-tıp uygulamalarımız

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BACKGROUND

Telemedicine widely takes root in all branches of modern medicine including traumatology and orthopedics. The main goal of this work was to present our experience with asynchronic teleconsultation in daily clinical practice, in particular in the treatment of polytrauma patients.

METHODS

Throughout 2000 and 2003, we carried out 144 teleconsultations for 92 men and 52 women (age range three months to 80 years). Of these, we were the inquiring party in 51 cases, the consulting one in 88 cases, and the mediator in five cases. Time passed till the completion of consultations ranged from 12 to 24 hours.

RESULTS

The number of consultants was one, two, three, and more in 99, 22, 3, and 15 teleconsultations, respectively. The most common questions (n=128) were those of treatment tactics. In the majority of cases, the consultant approved of the diagnosis suggested by the inquirer and formulated or corrected the scheme of the treatment. The majority of teleconsultations were concerned with various problems of traumatology (n=83) and orthopedics (n=31). For each clinical case, we received a mean of 2.6 replies (range 1 to 8). The effectiveness of the suggested treatment methods accounted for approximately 80% in final decision making. Teleconsultations provided considerable benefits in the treatment of polytrauma patients, including decreases in in-hospital treatment necessities (16%), in complication rates (9.2%) and their severity, the relative risk of developing complications (10%), and in the need for re-hospitalization (0.4%).

CONCLUSION

In view of our experience, we recommend that asynchronic consultations on the basis of the Internet-technology be more commonly used in the treatment of polytrauma patients.

Key Words: International cooperation; orthopedics; remote consultation; telemedicine; teleradiology; traumatology; Ukraine.

AMAÇ

Tele-tıp uygulamaları, ortopedi ve travmatoloji de içinde olmak üzere modern tıbbın bütün dallarında yaygınlaşmaktadır. Bu çalışmada, özellikle politravmalı hastaların tedavisinde olmak üzere, günlük klinik uygulamada tele-konsültasyon üzerine deneyimimiz sunuldu.

GEREÇ VE YÖNTEM

2002 ve 2003 yılları içinde, 92 erkek, 52 kadın hasta için 144 tele-konsültasyon gerçekleştirildi. Olguların yaş dağılımı 3 ay ile 80 yıl arasında değişmekteydi. Bu tele-konsültasyonların 51'inde soran taraf, 88'inde görüş bildiren taraf olduk; beşinde ise mediatör rolünü üstlendik. Konsültasyonların süresi 12-24 saat arasında değişmekteydi.

BULGULAR

Görüş bildirenlerin sayısı 99, 22, 3 ve 15 tele-konsültasyonda sırasıyla bir, iki, üç ve daha fazlaydı. En yaygın sorular tedavi taktikleri (n=128) üzerineydi. Olguların çoğunluğunda görüş bildiren taraf tanıyı onayladı; tedavi planını formüle etti ya da düzeltmelerde bulundu. Tele-konsültasyonların büyük bölümü travmatoloji (n=83) ve ortopedi (n=31) ile ilgili çeşitli sorunlarda yoğunlaşmaktaydı. Her bir klinik olgu için ortalama 2.6 yanıt (dağılım 1-8) alındı. Önerilen tedavi yönteminin etkinliği nihai karar vermede yaklaşık %80'i bulmaktaydı. Tele-konsültasyonlar politravmalı hastaların tedavisine önemli yararlar sağladı: Hastane içi tedavi gereksinimleri %16, komplikasyon oranı %9.2, komplikasyon gelişme riski %10, hastanın yeniden hastaneye yatırılması %0.4 oranlarında azaldı. Ayrıca, komplikasyonların ciddiyetinin de hafiflediği görüldü.

SONUÇ

Tele-konsültasyon üzerine deneyimimiz, Internet teknolojisine dayanan konsültasyon uygulamalarının politravmalı hastaların tedavisinde yaygınlaştırılması gerektiğini göstermektedir.

Anahtar Sözcükler: Uluslararası işbirliği; ortopedi; uzaktan danışma; tele-tıp; tele-radyoloji; travmatoloji; Ukrayna.

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The developments in computer and telecommunication technologies have enabled us to discover new possibilities to share treatment of patients with serious trauma and orthopedic pathology.[1-4] The telemedicine widely takes root in all branches of modern medicine including traumatology and orthopedics.[5-10]

On January 1, 2000, Donetsk R & D Institute of Traumatology and Orthopedics working group "Telemedicine" was founded in Ukraine. On January 25, 2000, our first teleconsultation was realized with professor M. Nerlich from Regensburg (Germany), who counselled a patient with serious pelvis trauma from Donetsk. On January 1, 2001, the Department of Informatics and Telemedicine was founded in Ukraine. From that time to this report a total of 144 teleconsultations were performed. The main goal of this work was to present our experience with teleconsultation in daily clinical practice, in particular in the treatment of polytrauma patients.

MATERIALS AND METHODS

Throughout 2000 and 2003, we carried out 144 teleconsultations. Of these, we were the inquiring party in 51 cases, the consultant in 88 cases, and the mediator in five cases. Time passed till the completion of consultations ranged from 12 to 24 hours. Teleconsultations were carried out for 92 men and 52 women, with an age range from three months to 80 years.

Indications for seeking a teleconsultation in traumatology and orthopedics were as follows:[5] To determine the diagnosis and treatment tactics in cases of infrequent, serious diseases, or in those with an atypical course; the need for a new and/or infrequent surgical (medical or diagnostic) procedure; to seek diagnosis or treatment due to the lack of immediate experts for the given medical condition or the lack of sufficient clinical experience; to confirm the selected tactics of treatment or to search alternative solutions of a clinical problem; geographical distance preventing the healthcare provider from timely attending the patient; possibility of lowering the cost of diagnosis and treatment without loss in quality and efficacy.

Our telemedical workstations consist of PCs (joined as a local network), digital cameras, printers, web-cameras, and an Internet connection of 128K. We mainly use asynchronic telemedical technologies (mailing lists, Internet forums, personal request via e-mail, "second opinion" service by our web-site (http://www. telemed.org.ua), and special telemedical software for the Internet base). So far, several aspects of telemedicine have been published in our literature by Donetsk R & D Institute of Traumatology and Orthopedics.[11-14]

RESULTS AND DISCUSSION

Of 144 teleconsultations, the number of consultants involved was one, two, three, and more (range from 4 to 8) in 99, 22, 3, and 15 teleconsultations, respectively.

During the teleconsultations, we evaluated 144 epicrises, 38 coloured digital clinical photographs, 325 digitized X-rays, 55 computed tomography scans, 103 magnetic resonance images, four sonograms, seven graphical images, 29 blocks of additional medical data (myelograms, blood tests, expert's decision, electrocardiograms, biopsy data, clinical tests), and five cytological microphotos.

Table 1 summarizes the distribution of questions that were considered by the consultants during the consultation process. The most common questions (n=128) were those of treatment tactics. In the majority of cases, the consultant approved of the diagnosis suggested by the inquirer and formulated or corrected the scheme of the treatment. Sometimes multiple questions were asked during the same session (for example,

Table 1. Distribution of questions considered during the consultation process

Group of questions	Number
Diagnosis (specification or approval)	15
Tactics of treatment	128
Peculiarities of surgical treatment	21
Terms of surgeries	5
Place and price (country, city, medical establishment) of treatment	13
Rehabilitation period (prognosis of function recovery, measures to be taken to facilitate the rehabilitation, the influence of trauma on bone development)	8
Additional examination methods	4
Social assistance	1
Evaluation of the treatment	7

Table 2. The scope of teleconsultations regarding medical specialties

Medical specialty	Number	%
Traumatology	83	57.6
Orthopedics	31	21.5
Neurosurgery (neurotrauma)	7	4.9
Oncology	6	4.2
Hematology	3	2.1
Rheumatology	4	2.9
Ophthalmology (eye trauma)	2	1.4
Teratology (locomotor congenital diseases)	5	3.5
Other (plastic surgery, endocrinology, etc.)	3	2.1
Total	144	100

"treatment tactics and the place", "diagnosis and tactics", etc.).

Medical specialties into which the scope of the consultations fell into are shown in Table 2. The majority of teleconsultations were concerned with various problems of traumatology and orthopedics. In five cases we were the mediator between the inquirer and the consultant.

Our experience with "second opinion" consultation is also worth mentioning. A special web-page was constructed for the patients on our site "Telemedicine in Ukraine" (http://www.telemed.org.ua) and a special e-mail address (consult@telemed.org.ua) was assigned. Teleconsultations carried out using this method accounted for 8.3%. Distant consultations were related with traumatology and orthopedics (50%), inborn pathologies (33.4%), neurosurgery (8.3%), and plastic surgery (8.3%). It is our worthwhile experience that 50% of all the "second opinion" teleconsultations pertained to traumas, acquired diseases, and inborn pathologies of the hand.

As mentioned before, we were the inquirers in 51 teleconsultations. For each clinical case, we received a mean of 2.6 replies (range 1 to 8), which was enough to make a final decision as for the scheme of the treatment. The suggested treatment tactics were accepted in 41 cases, refused in six cases, and in four cases, the recommendations could have been accepted if we had had the necessary equipment or instrumentation. The effectiveness of the suggested treatment methods accounted for 80% in final decision making.

Teleconsultations provided considerable benefits in the treatment of polytrauma patients, including decreases in in-hospital treatment requirements (16%), in complication rates (9.2%) and the severity of complications, the relative risk of developing complications (10%), and in the need for re-hospitalization (0.4%).

In view of our experience, we recommend that asynchronic consultations on the basis of the Internet-technology be more commonly used in the treatment of polytrauma patients.

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