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The advantages of using photographs and video images in telephone consultations with a specialist ın paediatric surgery

Ibrahim Akkoyun

ABSTRACT

Background: The purpose of this study was to evaluate the advantages of a telephone consultation with a specialist in paediatric surgery after taking photographs and video images by a general practitioner for the diagnosis of some diseases. **Materials and Methods:** This was a prospective study of the reliability of paediatric surgery online consultation among specialists and general practitioners. **Results:** Of 26 general practitioners included in the study, 12 were working in the city and 14 were working in districts outside the city. A total of 41 pictures and 3 videos of 38 patients were sent and evaluated together with the medical history and clinical findings. These patients were diagnosed with umbilical granuloma (*n* = 6), physiological/pathological phimosis (*n* = 6), balanitis (*n* = 6), hydrocele (*n* = 6), umbilical hernia (*n* = 4), smegma cyst (*n* = 2), reductable inguinal hernia (*n* = 1), incarcerated inguinal hernia (*n* = 1), paraphimosis (*n* = 1), burried penis (*n* = 1), hypospadias (*n* = 1), epigastric hernia (*n* = 1), vulva synechia (*n* = 1), and rectal prolapse (*n* = 1). Twelve patients were asked to be referred urgently, but it was suggested that only two of these patients, who had paraphimosis and incarcerated inguinal hernia be referred in emergency conditions. It was decided that there was no need for the other ten patients to be referred to a specialist at night or at the weekend. All diagnoses were confirmed to be true, when all patients underwent examination in the pediatric surgery clinic in elective conditions. **Conclusion:** Evaluation of photographs and video images of a lesion together with medical history and clinical findings *via* a telephone consultation between a paediatric surgery specialist and a general practitioner provides a definitive diagnosis and prevents patients from being referred unnecessarily.

Key words: Consultation, family medicine, general practitioner, image, patient referral

Department of Pediatric Surgery, Dr. Faruk Sükan Maternity and Children Hospital, Konya, Turkey

Address for correspondence:
Dr. Ibrahim Akkoyun,
Dr. Faruk Sükan Doğum ve Çocuk Hastanesi Selçuklu Konya TR-42090, Konya, Turkey.
E-mail: ibrahimakkoyun@yahoo.com

INTRODUCTİON

Consultation is a formal request of a physician by another physician to offer an opinion by considering the diagnosis and treatment of a patient's complaint. Consultation can be at the patient's own request, and sometimes information or advice can be provided by telephone.[1,2] Another issue is to decide whether it is necessary to refer the patient to a specialist as a matter of urgency. It is possible to provide a definitive diagnosis of certain diseases in pediatric surgery by inspection. Thus, we wanted to demonstrate that in the diagnosis of certain diseases, referral of captured pictures or video images to the specialist along with details of medical history, and clinical findings, can avoid unnecessary patient referrals and increase parental satisfaction.

MATERIALS AND METHODS

Telephone consultations were made with 26 general practitioners and 38 patients between August 2010 and October 2011. In the case of the general practitioner suspecting a particular diagnosis or the parents wanting a referral due to the urgency of their child's condition, the general practitioner was asked to send a photo or video image taken with a high-resolution mobile phone or digital camera to the pediatric surgery specialist (I.A) by a mobile phone or e-mail after informing the parent and obtaining consent. Additionally, the patient's history and physical examination findings were supplied by a phone interview. The general practitioner stated the pre-diagnosis and whether he wanted to send the patient for urgent treatment. The pediatric surgery specialist transferred the photos and video images evaluated under magnification to a notebook *via* a USB cable and established a diagnosis together with the other findings. First, the decision of whether the patient would be referred was made. Cauterization with a silver nitrate pen for patients with umbilical granuloma; antibiotic treatment for patients with balanitis; steroid-containing ointment (mometasone furoate 0.1%) for four patients with pathological phimosis,

and stool softeners, local ointments and defecation on the crouching position for child patients with both constipation and rectal prolapse were proposed. In addition, the general practitioners were asked to warn the other patients. For example, it was suggested that they give information about incarceration to the parents of patients with reductable inguinal hernia and patients with umbilical–epigastric hernia. All patients except two emergency patients were examined in the office of the pediatric surgery specialist in elective conditions to confirm the initial diagnosis. As the lesions on the face may lead to ethical and legal problems, patients who had these were excluded from the study. Despite there being visual material on the patients, their anonymity was not compromised.

RESULTS

Of 26 general practitioners included in the study, 12 were working in the city and 14 were working in districts outside the city. A total of 41 pictures and three videos of 38 patients were sent. These patients were diagnosed with umbilical granuloma ($n = 6$) [Figure 1], physiological/pathological phimosis ($n = 6$), balanitis ($n = 6$), hydrocele ($n = 6$), umbilical hernia ($n = 4$), smegma cyst ($n = 2$), reductable inguinal hernia ($n = 1$), incarcerated inguinal hernia ($n = 1$), paraphimosis ($n = 1$), burried penis ($n = 1$), hypospadias ($n = 1$), epigastric hernia ($n = 1$), vulva synechia ($n = 1$), and rectal prolapse ($n = 1$). It was decided that there was no need for them to be referred to a specialist at night or at the weekend. Twelve patients were asked to be referred urgently by family physicians, but it was suggested that only two of these patients who had paraphimosis and strangulated inguinal hernia be referred in emergency conditions. Reduction was performed on the patient with paraphimosis. The patient with incarcerated inguinal hernia was administered surgery in elective conditions three days after a reduction application. The parents of four patients were insistent on referral as they thought that their children were in a state of emergency, and the family physician was convinced that six other patients were also in a state of emergency. Two were emergent patients, as mentioned above, but there was no need for referral of the other ten patients. As a result, we have prevented unnecessary referrals of 10 out of 12 (83%) patients who would otherwise be referred under emergency conditions. Six of these ten patients came from districts outside the city, and the average distance from the center was 122 km (90–147 km). Among the ten patients who needed to be referred urgently, of those whose parents were insistent on emergency referral, one had umbilical hernia, one had vulvar synechiae, one had phimosis, and the other had umbilical granuloma. Of the six patients who needed to be referred urgently according to the general practitioner, one had inguinal hernia, two had hydrocele, one had rectal prolapse, and two had balanitis.



Figure 1: Photo taken by a general practitoner shows umblical granuloma

A mini-survey form was created to evaluate parents' satisfaction with this method, and the parents of 34 non-emergency patients completed this survey. The parents of 33 (97%) of the 34 non-emergency patients reported that they were satisfied with their medical care, were sure about the diagnosis, and they thought this method was accurate [Table 1]. Five out of six parents who had insisted that their children were emergency cases were now convinced that their children were not in a state of emergency and reported that there was no longer a need for emergency referral to a specialist.

When all non-emergency patients were examined in pediatric surgery outpatient clinics after 3–15 days (mean 7.1 days), it was observed that all diagnoses were correct, and that the diseases had passed or was passing, when compared to the initial images. An operation at 6 months was suggested for a newborn with hypospadias.

Table 1: Parent responses of 34 non-emergency patients on a mini-survey parental satisfaction evaluation form

Survey questions	Yes	No
I was satisfied with the medical care provided for my child	(97%) 33	1
I am sure about the diagnosis that my child received with this method	(97%) 33	1
I think this method is correct	(97%) 33	1
I want to go to a specialist after this diagnosis	1	33
I would like to use this method again in another diseases of my child	32	2
I would also like to use this method in one of my diseases	3	31

Umblical granuloma was excised in one patient. In the patient with vulvar synechiae, the adhesion was removed under local anesthesia and estriol containing pomad was prescribed. In other patients, decisions were made to continue treatment and follow-ups in the same way.

DISCUSSION

Consultation is an act of consulting with family physicians, general practitioners, emergency physicians, or clinicians on patients to another physician in order to seek information or advice about a certain diagnosis or treatment. During the consultation, the responsibility of the patient lies with the actual physician. Referral is the transfer of the patient to a specialist physician to treat the specific problem.[1] Consultation can be done at the patient's own bedding, and sometimes the general practitioner can provide information or advice by telephone.[2] The health expenditure for examination of a patient by family physician increases four times if a consultation takes places and four times if a referral takes places.[3] The most important reasons for referral are failure to diagnose the patient, the wish to seek the opinion of another, or an unconvinced parent of the patient.[4] There can also be hesitation about whether the patient will be referred urgently or in elective conditions. In developed countries, referral rates range from 2.3% to 5%, whereas consultation rates are around 35%.[5] In developing countries, these rates are much higher, and unnecessary referral rates can be as high as 53%.[6] The highest referral rates are among those with surgical diseases. Communication between general practitioners and specialist physicians during the consultation is very important.[7]

General practitioners and specialist physicians receive training in pediatric surgery in a very short period of time during medical education. For instance, this period in Turkey includes an internship lasting from 15 days to 1 month. Thus, the very short period of training received by general practitioners, family physicians and specialist physicians in this branch increases the rate of consultations.[8]

Some diseases related to pediatric surgery can certainly be diagnosed with inspection, for example, ranula, hypertrophic lingual frenilum, pectus excavatum, pectus carinatum, and umbilical anomalies, such as polyps, cysts and granulomas, epigastric hernia, hydrocele, inguinal hernia, phimosis, paraphimosis, balanitis, hypospadias, burried penis, smegma cyst, webbed penis, labial fusion, some intersex anomalies, polydactyly, syndactyly, burns, hemangioma and some skin diseases, etc. In confirming these diagnoses, the patient's history can sometimes be very helpful. For example, an occasional swelling in the inguinal region with crying or coughing suggests inguinal hernia, and an umbilical swelling suggests umbilical hernia. A painless scrotal swelling with a stable size suggests non-communicated hydrocele. Yet, some physical exam findings are considered here. For example, a gently movable umbilical or inguinal swelling can confirm the diagnosis of reductable inguinal hernia. A further example, transilluminating is important for a hydrocele.

Today, with advanced technology, it is possible to take high-resolution pictures and videos at any time and send them immediately by telephone or by e-mail. In inguinal pathologies, anal protrusion and anal swellings, if the physical examination is normal, the pediatric surgeon can make a definitive diagnosis by using the pictures taken by the parents, because the parent's description of the lesion remains subjective and will never be enough for diagnosis.[9,10] Similarly, although history and physical examination can give the specialist an idea in a telephone consultation, verbal descriptions of the lesion can sometimes cause difficulties in differential diagnosis. In neurosurgical emergency consultations, video-clips of radiological images can be transferred by mobile phone.[11] In this way, it is possible both to establish a more rapid diagnosis and initiate treatment as soon as possible and to prevent repetitive and unnecessary examinations.

In this study, general practitioners were asked to give both the history and physical examination findings and to send a picture of the lesion when the family physicians were hesitant about the diagnoses or the parents had suspicions about the diagnosis and wished to be referred to a specialist. When all of these were taken into account, all patients were diagnosed correctly. Thus, the referral of ten patients in emergency conditions and six patients coming from far outside the city were prevented. Thus, unnecessary emergency referrals were prevented in 83% of the patients. In addition, patients could be diagnosed immediately and treatments could be started without a delay. Careful and thoughtful communication supported by a photo or video ensured that almost all the parents were satisfied with this application. The dissatisfaction and stress of the family was obvious in the cases of unnecessary emergency referrals over long distances at weekends and/or at nights. One of the advantages of this method is the chance of reduction in work load and decrease in health care expenditures with the reduction in

unnecessary specialist referrals.

Based on this study, we suggest that both family physicians and general practitioners, as well as physicians working in different hospitals, physicians working in the emergency department, clinicians on duty consult the pictures, videos or X-ray of the lesion of selected cases to the specialist of the relevant department during telephone consultations with this method. This can provide rapid diagnosis and the initiation of treatment without a delay and can prevent unnecessary hospital invitations. Therefore, developing technical infrastructure related to the visual systems in hospitals would make the work much easier, because currently, it is easy to take a picture or video in the MPEG format and transfer it *via* the same mobile-phone or by e-mail with a 3G multimedia message system available on personal mobile-phones.

The evaluation of photographs and video images of a lesion together with medical history and clinical findings *via* a telephone consultation between a pediatric surgery specialist and a general practitioner about some patients concerning pediatric surgery provides a definitive diagnosis and prevents patients from being referred unnecessarily.

Thus, a delay in the diagnosis can be prevented, rapid treatment can be initiated, and parental satisfaction can be increased.

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