

Web Based Video Educational Resources for Surgeons

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Abstract

During the last years, video files showing different surgical procedures have become extremely available and popular on the internet. They are available on both free and unrestricted sites, as well as on dedicated sites which control the medical quality of the information. Honest presentation and minimal video-editing to include information about the procedure are mandatory to achieve a product with a true educational value. The integration of the web-based video educational resources in the continuing medical information system seems to be limited and the true educational impact very difficult to assess. A review of the available literature dedicated on this subject shows that the main challenge is related to the human factor and not to the available technology.

Keywords: Video-files; Internet; Surgery; Training

Introduction

The classic training of the surgeons to perform a certain procedure involves 3 main steps: see / assist the procedure, perform the procedure with assistance on behalf of an experienced colleague and perform the procedure alone; this approach is a time-consuming one, with serious limitations especially if the training is not performed in a high-volume center. There is an overall need to improve the training of the young surgeons, but the exact way to do this is a matter of great debate [1, 2]. On the other hand, e-learning resources are now accepted as an important part of the medical education – including specific technical skills, allowing a better, faster and cheaper training [3, 4]. The aim of this article is to evaluate the educational possibilities and limitations of the available web based video resources showing technical details of different surgical procedures; both basic general procedures (appendectomy, cholecystectomy and hernia repair) and advanced techniques (video-assisted pulmonary resections, pancreatico-duodenectomy, esophagectomy) were followed and evaluated using internet-based educational video-resources.

Technological aspects

It is an obvious fact that internet technology has completely changed our way of life, including the training of the new generations [5]. E-learning has gained an important place in the medical education, being integrated in the general trend of using the new available technologies to improve and fasten the educational process [3,4,6]. Training in surgery has specific problems, mainly due to the need to assimilate specific technical skills and the high degree of traditionalism. A major challenge remains the need to avoid supplementary risks for the patients and morbidity in the training process of the young residents [7, 8]. On the other hand, the use of surgical videos in order to present and discuss a certain technique has been very popular in the surgical community since the 1980's when relatively small video cameras have become available for non-professional users [9].

Modern technology allows an easy digital recording of the surgical procedures; high quality videos and clear still images are easy to achieve at low costs using personal computers [10]. However, some basic technological knowledge is required on behalf of the surgeons involved in this activity for editing the original video files in order to add supplementary information concerning anatomic details, operative steps, position of the patient and trocars, angle of view and how to deal with intra-operative difficulties etc. [11]. The nowadays high-speed internet connections allow the upload and download of large amounts of data, including video files showing specific surgical procedures in a high quality / definition format. Most medical congresses and conferences include live transmissions of surgical procedures, including real-time transfer of video files at high distances [12, 13]. Advanced training courses with live surgery providing detailed presentation of the cases, intraoperative set-up and positioning, anesthesia procedures and handling of the intraoperative situations, as well as the possibility of bidirectional discussions between the operating room and auditorium are nowadays also possible at relatively low costs [14].

Recent technological developments have made possible the display on handheld devices (PDAs, Pocket PCs and smart phones) making them really available “always, anywhere, anytime” [15]. High speed internet connections allow the possibility to organize surgical teleconferences with the display of PowerPoint presentations and video files using free internet software such as Skype and UPSTREAM [16].

Another aspect is the existence of various technical variations for a specific surgical procedure. In many cases, each of the variants has advantages and disadvantages which are difficult to quantify in an evidenced-based spirit with personal preference playing an important role. Coming in close contact with each variant would require repeated visits to certain medical units using a specific technique, which is obviously time-consuming and requires significant financial resources. A typical example is VATS (video-assisted thoracic surgery) lobectomy where there is no standardized technique [17], with many approaches available (uni-portal or more trocars, anterior or posterior approach, fissure less technique etc.); each of them is available for watching in both dedicated and non-specialized web pages [18, 19]. A rapid and easy evaluation is therefore available, so that a young surgeon may choose the technique which he considers that is best fitted for him and his patients. A simple search on YouTube shows details of surgical technique and multiple variations for performing complicated procedures such as pancreaticoduodenectomy or esophagectomy.

Educational Aspects

Free websites such as the very popular YouTube channel (<https://www.youtube.com>) raise specific problems due to the (almost) unrestricted and uncontrolled possibilities to upload, visualize and download video files. In many cases, the video files available are dedicated more to the patients seeking information on a specific disease or surgical procedure and have a questionable quality in terms of medical information [20]. A study published in 2014 on the information available on YouTube concerning the treatment of gall stones found an alarming 56.5% rate of videos with incorrect medical information [21]. Several studies suggest the possibility to use YouTube as a

medical training tool [22, 23] but others highlight the existence of a high proportion of low quality videos with misleading information; an increased quality of the videos is observed among the files uploaded by medical doctors or hospitals, especially tertiary centers [24].

There are now more dedicated sites where various video files detailing specific surgical procedures are available for watching and downloading; many of these files were presented at medical conferences. In most cases, the videos have an audio comment or are accompanied by footnotes or even significant amounts of text that complete the information provided by the videos and make them easier to follow [15, 25]. Surgical video-files are also frequently available as a supplement to classic printed papers (<http://mmcts.oxfordjournals.org>), in order to highlight specific details of a surgical technique [26, 27]. All these video-files are more reliable as a training tool for surgeons since they are verified / peer-reviewed by experienced surgeons before being uploaded and becoming available for the public. A typical example is the CTS (cardio-thoracic surgery) network which makes available videos with recently developed technology or techniques on a dedicated platform (<http://www.ctsnet.org/videos>). The U.S. National Library of Medicine has a section with commented video-files detailing various surgical and endoscopic procedures available at <https://www.nlm.nih.gov/medlineplus/surgeryvideos.html>.

Measuring the exact educational impact of the available surgical web-based video resources is a difficult task. Most available information show an impressive number of downloads and/or visualizations but these numbers may be delusive. Some studies performed for YouTube medical video files found no correlation between the quality (in terms of medical information) and their impact measured by the number of views, likes and comments [21, 25]. As for other new training technologies, the true educational impact in terms of improving the learning curve is unknown [28, 29]. The new video-assisted / endoscopic approaches offer an easier training in many fields of surgery [30].

Websurg – an educational site dedicated to minimally-invasive launched in the 2000's has shown an impressive increase, having now over 330000 registered members to whom are available more than 1200 surgical videos, 500 recorded lectures, 130 animated operative technique presentations and 700 expert interviews and debates (<http://www.websurg.com/>). The amount and quality of the information, as well as the user-friendly interface with detailed multilingual explanations have transformed this site in a real “world virtual university”.

Although on-line continuing medical education (CME) is already an accepted training possibility completely integrated in the US and European CME system, the video files seem to play a limited role with most of the online CME being based on low technology resources involving mainly text +/- images or repurposed live lectures [31]. It is expected that the development of endoscopic / video-assisted surgery and the increased availability and simplicity of the video-editing solutions will also increase the role of the video resources in the online CME process.

Conclusions

The web based video resources are nowadays an important part of the education of surgeons. Although they cannot completely replace traditional training, they allow an obvious improvement of the quality, speed and costs of training. Current technology allows easy storage and quick transfer of large amounts of data, thus making high quality video files with specific surgical procedures to be easily available on the internet. The main challenge is not related to technology, but to the educational value of the movies. Ethical aspects – related to an honest presentation of the duration of the procedure, presentation of the incidents, accidents and complications, as well as of the results are crucial. A possible solution may be the existence of dedicated web sites with an editorial managing and peer review system similar to the classic medical journals.

Conflict of Interest

Petre Vlah Horea Botianu is assistant editor of the Multimedia Manual of Cardio-Thoracic Surgery (<http://mmcts.oxfordjournals.org/>).

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