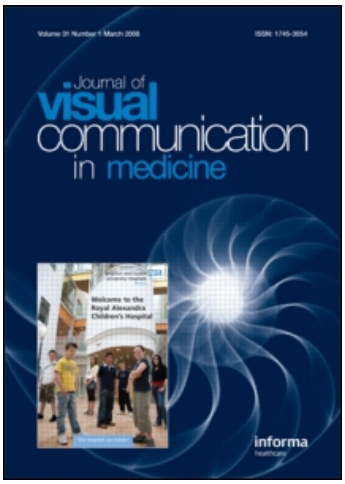

Journal of Visual Communication in Medicine
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713428767

Videoconferencing : Live Procedures During Conferences - Practical Problems and Solutions

Victor Grech [a]; Hugo Agius Muscat [a]; Brian Cassar [a]
[a] Mater Dei Hospital, Malta

Online Publication Date: 01 June 2009

To cite this Article Grech, Victor, Muscat, Hugo Agius and Cassar, Brian(2009)'Videoconferencing : Live Procedures During Conferences - Practical Problems and Solutions',Journal of Visual Communication in Medicine,32:2,53 — 54
To link to this Article: DOI: 10.1080/17453050903028950
URL: http://dx.doi.org/10.1080/17453050903028950

Videoconferencing : Live Procedures During Conferences – Practical Problems and Solutions

VICTOR GRECH, HUGO AGIUS MUSCAT AND BRIAN CASSAR
Mater Dei Hospital, Malta

INTRODUCTION

Video conferencing (VC) is now a commonly used tool within the medical field worldwide.[1] This technique, in a modified format, is ideal for viewing and discussing live cases to show live procedural interventions during a conference.

We recently organised a cardiology subspecialty conference in Malta, and used VC to transmit audio and video from the theatre Cardiac Catheterisation Suite (CCS), on Level -1 of Mater Dei Hospital (MDH) at Tal-Qroqq, Msida to the conference venue at the Mediterranean Conference Centre (MCC) in Valletta, Malta, a distance of 4km (*figure1*), with audio only back to the theatre for the purpose of live discussion.

There are several ways in which such a link may be established, and this paper reviews the practical problems that we encountered while exploring our various options, and the final solution. This exercise may be found useful by others who may attempt a similar type of link.

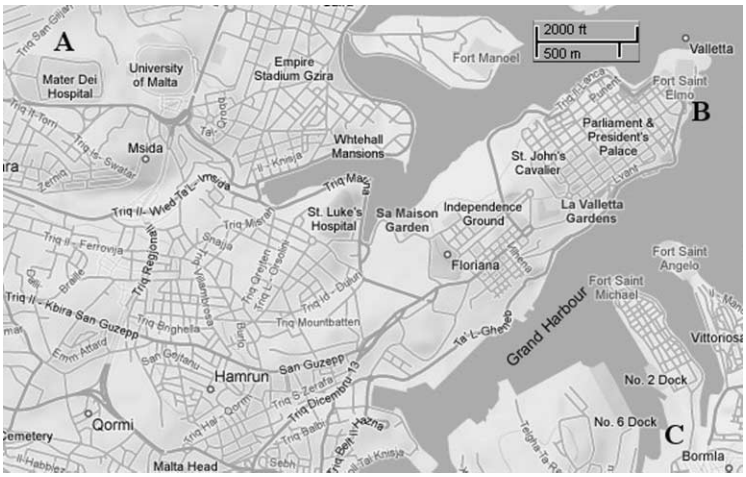

Figure 1. Mater Dei Hospital (A – top left), Mediterranean Conference Centre (B – top right), Bormla Sports Complex (C – bottom right).

METHODS

A request was put in by the conference organiser to the MDH Medical Illustrations Unit and to the Director of Information Management & Technology. This request entailed the transmission of an audio and video link from the CCS to a professional audience at the MCC with audio only back to the theatre for the purposes of live discussion, for one morning.

This conference focused on Grown Up Congenital Heart disease (GUCH), that is, adult survivors of congenital heart disease in whom intervention is often done in infancy and childhood. GUCH Malta was held in December 2008 and comprised an imposing international faculty and an international audience. The two procedures were closures of holes in the heart, one case involving a hole between the upper chambers of the heart (the atria, hence an atrial septal defect closure), and the other involved a hole

Correspondence: Prof. Victor Grech, Paediatric Department, Mater Dei Hospital, Msida MSD 2090, Malta. Tel 2545 0000, Email: victor.e.grech@gov.mt

Journal of Visual Communication in Medicine, June 2009; Vol. 32, No. 2, pp. 53-54
ISSN 1745-3054 Print/ISSN 1745-3062 online
DOI: 10.1080/17453050903028950

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between the lower chambers of the heart (the ventricles, hence a ventricular septal defect closure). These were closures through cardiac catheterisation techniques, monitored via fluoroscopy screening and angiography, and transoesophageal echocardiography.

Video signals to be sent to MCC were to be threefold: a roving camera at the CCS to focus on the interventionalists during the procedures and their hands while preparing and assembling equipment, a video feed from the angiography machine and a video feed from the echocardiography machine.

Equipment needed for such a simple video conference had already been purchased by the hospital's Medical Illustrations Unit, and this was a Sony Ipela. This machine is capable of being fed 4 different video inputs and 1 audio input. These signals are digitally transmitted over IP through the creation of a website which selected users can log on to in order to obtain access to transmissions by means of a password. Once the website is accessed, the viewers may choose any camera input they would like to see at any one time. It was estimated that this could be set up over a half hour. However, the Government IT Company that supervises the Government of Malta's intranet, internet and email imposes heavy restrictions and filtering of a security nature and for this reason, the transmission over IP could only be done over the Government of Malta's intranet. The MCC does not comprise a part of this intranet.

A workaround was offered in that the closest intranet point was a public health laboratory located 250 metres away from MCC. The signal could then be transferred over a secured wireless connection to MCC but this was expensive (estimated in the region of 2000EUR).

An ISDN system was offered by one of the local telephone and mobile providers but on testing, the system was fraught with problems and was abandoned. A satellite connection was prohibitively expensive and was never an option.

A professional agency was brought in for advice, and another solution was offered in that the CSS was adjacent to a hospital courtyard. It was therefore easily possible to mix signals as needed at CSS, transfer by cable to the roof of the hospital, set up a microwave dish on the hospital roof and transmit via digital microwave to MCC. However, no direct line of sight was available from the roof of MDH to MCC. It was therefore decided to bounce the signal from the roof of a sports complex in Cospicua across the Grand Harbour, and thence to MCC, in triangular fashion, using direct line of sight transmission. This was then projected at MCC using a standard projector.

However, this transmission was one-way, only to MCC. The simplest option to return an audio signal was via ordinary telephony, and for this purpose, a hands free telephone set was set up in CSS close to the interventionalists and the telephone signal was received at MCC over a telephone and passed over the hall speakers. A wireless microphone was connected to the telephone, and faculty and delegates were able to discuss the procedures in progress with colleagues at CSS.

The mixer was able to superimpose video feeds, such that at any time at MCC, a 'picture in picture' could be shown at will, for example, the interventionalist's hands manipulating a catheter while also viewing the results of said manipulation on fluoroscopy screening.

RESULTS

The quality of this digital transmission was excellent and the delegates' feedback forms clearly indicated that this was one of the most enjoyed portions of the conference. If a picture is worth a thousand words, then what is the value of a live link!

DISCUSSION

Although technology has come a long way, and continues to progress at a tremendous rate, problems may readily be encountered while setting up what theoretically appear to be simple connections between two locations. As we have shown above, such problems may not only be related to hardware, software and network bandwidth, but also to security restrictions and practical issues such as line of sight. We hope that our experience may prove useful to others who may attempt to set up such a link.

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