

Integration of Arthroscopic and C-Arm Imaging Into the Arthroscopic Image Management System

Technical Note

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INTRODUCTION

Image and video documentation during arthroscopic surgery has become routine. Most imaging systems are set up to provide high quality color printouts and CD or DVD documentation facilitating postoperative patient education as well as chart documentation. With more involved procedures such as arthroscopic treatment of osteochondritis dissecans, articular cartilage procedures combined with osteotomies, hip arthroscopies, revision knee ligament reconstructive procedures, and arthroscopic fracture management, the need to document fluoroscopic images as well as arthroscopic images has become imminent. Fluoroscopic as well as arthroscopic towers usually allow for separate image printout and storage. However, it is more convenient and efficient to integrate both devices into one imaging system, allowing for the simultaneous documentation of arthroscopic and fluoroscopic images on one printout sheet or CD/DVD.

The purpose of this brief description of a low-budget technique is to integrate fluoroscopic imaging and arthroscopic images into the same image management system. This procedure is easy to perform and aids in streamlining the management of patient imaging records.

MATERIALS AND METHODS

Most fluoroscopic devices have a coaxial output jack on the back of the device. This output jack is designed to

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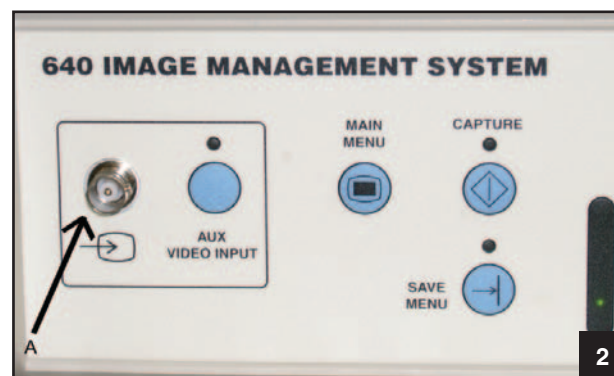
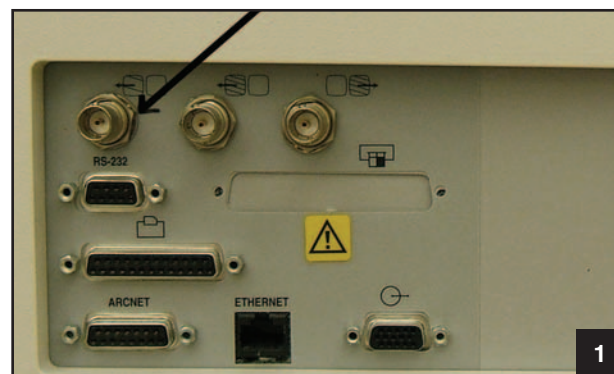


Figure 1. Coaxial output jack for auxiliary monitor on the OEC 9800 plus (General Electric Co, Waukesha, Wisc).

Figure 2. The arrow "A" indicates the coaxial input jack for data transfer to the imaging system. The "capture" button is visible towards the right of the picture.

allow for digital data transfer to an additional monitor. We use the FluoroSCAN Premier 60,000 (Amber Diagnostics, Orlando, Fla) and the GE OEC 9800 plus (General Electric Co, Waukesha, Wisc). Both devices have additional coaxial output jacks at the back of their housing designed for the above-mentioned additional monitor (Figure 1).

The data image system that we use is a 640 Image Man-

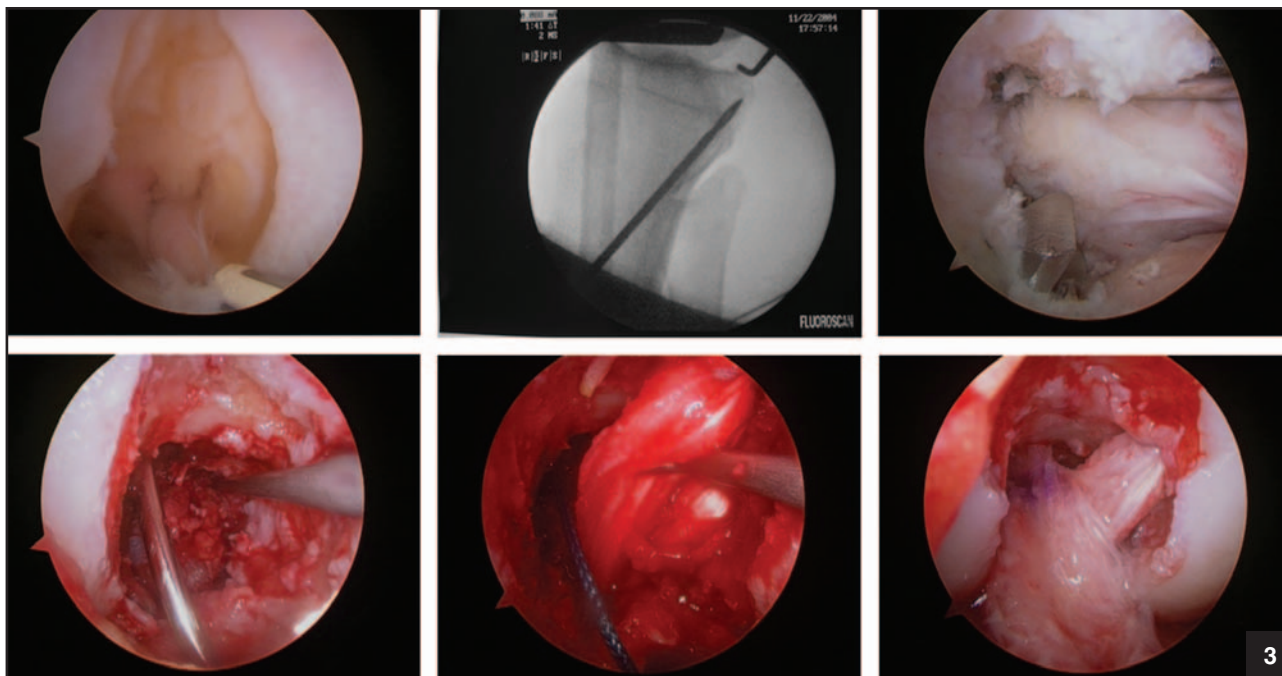


Figure 3. Printout of an arthroscopically performed anterior cruciate ligament/posterior cruciate ligament (ACL/PCL) reconstruction showing arthroscopic and FluoroSCAN (Amber Diagnostics, Orlando, Fla) images side-by-side.

TABLE

MANUFACTURERS OF VIDEO MANAGEMENT SYSTEMS THAT PROVIDE COAXIAL INPUT JACKS FOR THE USE OF THE DESCRIBED TECHNIQUE

Vendor	Product	Website
Stryker	SDC-HD SDC-Pro2	www.stryker.com
Smith & Nephew	640 Image Management System	www.endo.smith-nephew.com
Karl Storz	KarlStorz-SCB	www.karlstorz.com
Arthrex	N-Stream Image Archival System	www.arthrex.com

agement System by Smith & Nephew (Smith & Nephew Inc, Andover, Mass). This system has a coaxial input jack in the front of the housing allowing for digital data transfer of video or still images (Figure 2). To arrange for the data transfer, the coaxial jacks need to be connected with a coaxial cable. Once the desired fluoroscopic or C-arm picture has been obtained the “capture” button on the imaging system activates the capture feature of the 640 Imaging System (Figure 2). This button has to be triggered by an unscrubbed assistant. The fluoroscopic/C-arm image will then be transferred onto the capture screen of the 640 Imaging System. Once transferred, the image is integrated into the

data stream such that it can be printed or burned side-by-side with the arthroscopic images (Figure 3).

DISCUSSION

We have used this system setup successfully in the operating room for arthroscopically assisted osteotomies, arthroscopic fracture management, tunnel and screw documentation in knee ligament surgery, and hip arthroscopies and found it to be helpful for our data documentation. It facilitates communication with patients postoperatively and eliminates the need for additional storage of printouts from the fluoroscan or C-arm thus facilitating patient data storage.

This technical pearl can be reproduced with other image management systems. We contacted representatives of three major manufacturers for arthroscopic image management systems. All contacted manufacturers assured us that their equipment incorporates an auxiliary video input capability that uses a coaxial input jack (Table).

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AUTHOR QUERIES

Figure 4 was omitted due to space constraints.