

CT Focus



DETECTION OF PANCREATIC CARCINOMA AFTER ABDOMINAL CT WITH VOLUMEN ORAL PREP

EXCERPTS OF A CASE STUDY BY ALEC MEGIBOW, MD

Conventional, higher-density oral contrast agents can cause artifacts and streaking during computerized volumetric imaging in multidetector CT (MDCT). To achieve optimal results, it is important that the oral contrast be lower in density than unenhanced soft tissue (~45-60 HU) to allow the radiologist to clearly see the soft tissue of the bowel wall. There is a need for a low-density oral contrast that will not interfere with the bright signal of the high HU of IV contrast.

resectability by evaluating its extension into local arteries or distant metastases.

Exam Procedure

Abdominal imaging with multislice detector, 100 mL IV contrast, 0.1 mg IV of glucagon, and VoLumen oral preparation were chosen as exam features. Prior to exam, the patient drank two bottles (900 mL) of VoLumen given over 30 minutes. An additional 300 mL was given when the patient entered the CT suite.

In this example, the abdominal CT was performed with VoLumen®, a new, patent pending, low Hounsfield value (LHV) (~15-30 HU) oral contrast that produces the effect of a neutral contrast agent within the bowel wall.

Abdominal CT with a 16-slice MDCT scanner (16 x 0.75 mm mode) was performed. Scanning was performed in both pancreatic (50 sec delay) and portal (90 sec delay) phases of imaging. Scan review was performed on 3D volume-rendered images created from 1 mm slices and 3 mm axial images sent to PACS.

Patient History

The patient, a 70-year-old female, presented with severe epigastric pain radiating to her back. A pancreatic carcinoma was suspected. The patient was referred for abdominal CT to determine whether or not a pancreatic neoplasm was present. If one was detected, the next step was to determine its possible

Abdominal CT revealed an infiltrating lesion in the pancreatic body (Figure 1). There was dilation of the pancreatic duct in the tail of the gland. MIP CT angiographic images (Figure 2) revealed encasement of the hepatic artery, making the tumor unresectable.

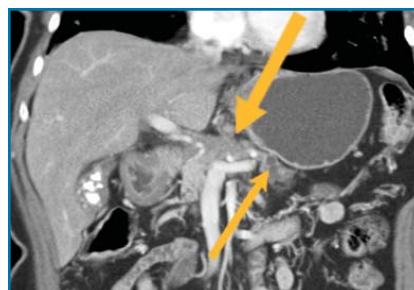


Figure 1. Clip plane editing in 3D can cut away superimposed bowel structures providing an unencumbered view of the pancreatic lesion infiltrating the body of the gland (thick arrow). VoLumen oral prep helped reveal the obstructed pancreatic duct (thin arrow).

Figure 2. MIP CT angiogram clearly shows typical encasement pattern of the hepatic artery (arrow), rendering this lesion unresectable.

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2005 CONVENTION SCHEDULE

RADIOLOGY and VIRTUAL COLONOSCOPY

6th International Symposium on Virtual Colonoscopy

Virtual Colonoscopy Symposium
Boston, MA • October 17-18, 2005
<http://www.virtualcolonoscopy.net/>

RSNA 2005

The Radiological Society of
North America
Chicago, IL • November 27-December 2, 2005
www.rsna.org

GASTROENTEROLOGY

ACG 2005

The American College of Gastroenterology
Honolulu, HI • October 28-November 2, 2005
www.acg.gi.org

NYSGE 2005

The New York Society for Gastrointestinal
Endoscopy
New York, NY • December 14-17, 2005
www.nysge.org

SPEECH PATHOLOGY

ASHA 2005

American Speech-Language-Hearing
Association
San Diego, CA • November 18-20, 2005
www.asha.org

DETECTION OF PANCREATIC CARCINOMA AFTER ABDOMINAL CT WITH VOLUMEN ORAL PREP *continued*

Conclusion

VoLumen LHV oral contrast allowed 3D sculpting of the bowel away from the areas critical to assessment of the patient's disease status. If a higher-density, positive contrast agent had been used, 3D rendering would have been significantly more difficult, since contrast-filled loops tend to overlay the pancreas and vessels. Based on the results of this study, a tumor was determined to be present and unresectable. The patient was spared any surgical morbidity. Abdominal CT with VoLumen helps provide high-quality volume-rendered images for the evaluation of abdominal-pelvic applications.

LIGHTS! CAMERA! INSUFFLATE!

SPOTLIGHT ON NEW PROTOCO₂L VIDEO



E-Z-EM will soon release a brand new instruction video for its PROTOCO₂L Automated Carbon Dioxide (CO₂) Insufflator. Designed as a training tool for new owners and E-Z-EM sales representatives, and an informational video for interested prospects, the PROTOCO₂L DVD covers a broad range of topics including; a full system overview, a complete insufflation demonstration and a troubleshooting section.

Adequate colonic distension is an absolute requirement for a successful virtual colonoscopy, or CT colonography, exam. Recent studies demonstrated that automated insufflation using E-Z-EM's PROTOCO₂L system can yield equivalent or even superior distension to manual insufflation. One study showed that automated CO₂ insufflation was better tolerated than room air.¹ This study also revealed that diffusion of CO₂ through the colonic wall was extremely rapid compared with air, diminishing the presence of ileocecal valve reflux. The results of another study showed that average distension was significantly better in an automated CO₂ group – with only one collapsed segment, versus 17 in a manually insufflated group.² A third study noted that automated CO₂ insufflation demonstrates improved distension compared to manual insufflation, particularly in segments that are prone to collapse.³

The PROTOCO₂L DVD is expected to have its world premiere in September 2005. Copies will be available through your local E-Z-EM sales representative, or by contacting our Customer Solutions department at 1-800-544-4624.

1. University of Rome "La Sapienza" – Rome, Italy, Dr. Franco Iafraite, et. al. Paper presented at RSNA Scientific Assembly and Annual Meeting 2004.
2. Charité Hospital – Berlin Germany, Dr. Patrick Rogalla, et al. Paper presented at RSNA Scientific Assembly and Annual Meeting 2004.
3. Yee J. Comparison of colonic distention using electronic CO₂ insufflation and manual atmospheric insufflation on CT colonography. Paper presented at RSNA Scientific Assembly and Annual Meeting 2002.

EMPOWERCTA WITH SALINE CHASER BOLUS IN CT CORONARY ANGIOGRAPHY

EXCERPTS OF A TECHNICAL NOTE BY U. JOSEPH SCHOEPF, MD

In non-invasive CT angiography of the coronary arteries there is a problem with streak artifacts caused by dense contrast media in the superior vena cava and the right heart chambers. Streak artifacts arising from the right atrium and ventricle of the heart may obscure the right coronary artery or result in artifacts mimicking stenotic disease along the course of the vessel, especially at 2D and 3D image post-processing.

These artifacts may be reduced or avoided entirely, if at the time of image acquisition the contrast material is flushed from the venous system by use of a saline chaser technique with a dual-syringe injection system, such as E-Z-EM's EmpowerCTA®. This method offers other benefits as well. A saline chaser bolus delivered following administration of a contrast media bolus has been shown to reduce the total amount of contrast media needed for optimal vascular opacification. In addition, it results in a more "compact" contrast media bolus which facilitates the derivation of tissue perfusion parameters at CT perfusion measurements. A saline chaser bolus may also help to better utilize the injected contrast media by prolonging the plateau phase of the contrast media bolus, resulting in higher and more consistent, homogenous vascular enhancement.

Saline Chase Application

This concept is illustrated in the case of a 42-year-old man with an anomalous origin and course of the left coronary artery (LCA, Figure 1). The left coronary artery has an anomalous origin medial to the origin of the right coronary artery (RCA) and crosses the median line prior to giving off branches supplying the left side of the myocardium. (Figures 1-3).

The scan was performed using this facility's routine CT coronary artery protocol (Table 1) and saline chasing technique, using E-Z-EM's EmpowerCTA dual-syringe injector system.

Table 1. CT Coronary Artery Protocol

Scan parameter	
kV	120
eff. mAs	500
Gantry rotation	420 msec
Collimation	16 x 0.75 mm
Pitch	0.31
Recon thickness/increment	1 mm/0.6 mm
Recon cardiac (ECG) phase	diastole (-400 msec before R)
Scan time	21 sec
Contrast timing	Test bolus (20 cc contrast medium)
Contrast volume	100 cc
Contrast conc.	300 mg Iodine/mL
Injection speed	4 cc/sec
Saline volume	40 cc
Saline inj. speed	4 cc/sec

Results

Use of E-Z-EM's EmpowerCTA with a saline chaser bolus resulted in contrast enhancement almost exclusively of the arterial side of the cardiac circulation (left ventricle-LV, left atrium-LA; Figure 2) with high and consistent opacification and exquisite delineation of the right coronary artery (RCA) from the significantly less enhanced right ventricle (RV) and right atrium (RA; Figure 2). This facilitates threshold-dependent 3D visualization (Figure 3) of this vascular anomaly, since a single, predetermined threshold enables uniform rendering of the entire coronary artery tree.

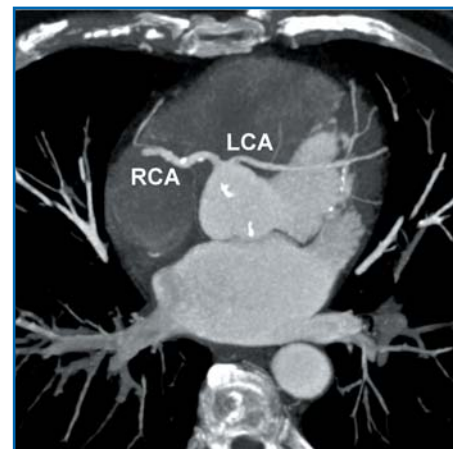


Figure 1. Anomalous origin of the left coronary artery (LCA) medial to the origin of the right coronary artery (RCA).

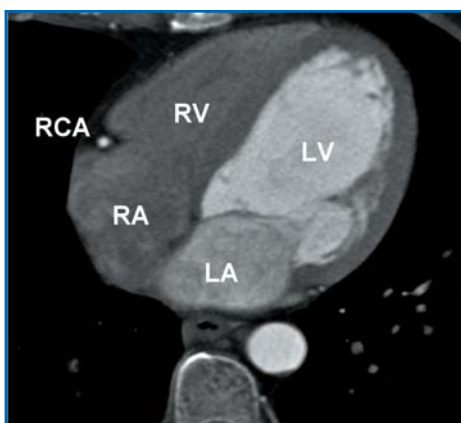
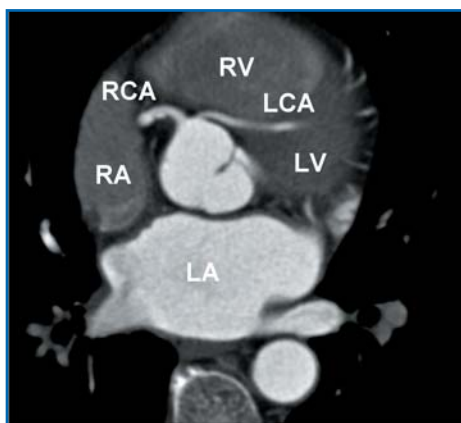


Figure 2. Saline chasing technique results in contrast enhancement almost exclusively of the arterial side of the cardiac circulation (left ventricle-LV, left atrium-LA) with high and consistent opacification and exquisite delineation of the right coronary artery (RCA) from the significantly less enhanced right ventricle (RV) and right atrium (RA).

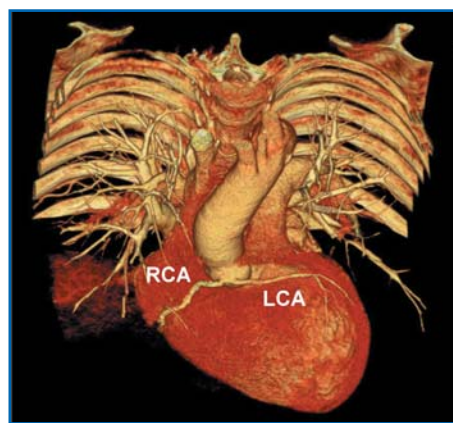


Figure 3. Threshold-dependent 3D visualization of this vascular anomaly is facilitated with use of saline chasing technique, since a single, predetermined threshold enables uniform rendering of the entire coronary artery tree.

NEW TO THE MARKET:



CT INJECTOR REPORTING INFORMATION SYSTEM
CT Injector Data Management



IRiSCT Injector Reporting Information System is a revolutionary new concept in CT suite management from E-Z-EM. The IRiSCT software package helps a facility turn its E-Z-EM Empower Injector systems into an integrated data management network. IRiSCT's patent pending design integrates EmpowerCT® (single-barrel) and EmpowerCTA® (double-barrel) injector systems, to help an administrator consolidate

and access all injection data from the convenience of their office. IRiSCT automates the data log process for contrast consumption, actual volumes injected and the amount of any residuals, saving reporting and analysis time. IRiSCT is designed to readily display and easily export this data into the Microsoft® Office Suite for analysis and review. Connectivity is established over a facility's existing network; no special cabling is necessary. IRiSCT features a TCP/IP network protocol, dedicated firewall security, and a network database backup/restore function. Productivity bottlenecks and other sources of inefficiency can be identified by comparing operations room-to-room in the 12-month view. IRiSCT quickly provides critical information to help a busy department determine contrast budgets, control costs, and manage historical patient information easily.

For more information on IRiSCT, please contact E-Z-EM's Customer Solutions department at 1-800-544-4624.

EARN CE CREDITS

E-Z-EM, Inc., is proud to support CME courses in virtual colonoscopy in 2005.

We cordially invite you to attend one of our Centers of Excellence to learn more about this new imaging modality.

Harvard Medical School*

September 26-27, 2005
Boston, MA

For more information or to register, visit www.virtualcolonoscopy.org/training.htm on the Web.

New York University (NYU)*

October 7-8, 2005
New York City, NY

For more information or to register, contact Michelle Koplik 212-263-3936.

University of California*, San Francisco (UCSF)

November 4-5, 2005
San Francisco, CA

For more information or to register, visit <http://www.radiology.ucsf.edu/postgrad/courses/> on the Web.

CT Colonography Hands-on Workshop**

November 12-13, 2005
Rochester, MN

For more information or to register, contact: Matrix Meetings
Phone: 507-288-5620
Fax: 507-288-0014

*University is fully accredited by the ACCME to provide continuing medical education for physicians. Please visit the web site for more information.

** Minnesota Medical Association is accredited by the ACCME to provide continuing medical education for physicians.

VISUALIZE A HEALTHIER WORLDWIDE WEB
E-Z-EM Launches New Site



On August 22, 2005, E-Z-EM's new web site was unveiled at www.ezem.com. Based on input from customers and employees, the site features a brand new design and structure, and includes information on E-Z-EM products, services, news and events, as well as sales representative and/or distributor locators, and more. Users can easily navigate their way around with the help of clearly labeled toolbars and icons. The site is divided into five different, focused sections: **CT Imaging**, **Virtual Colonoscopy**, **Speech Pathology**, **Gastroenterology** and **Healthcare Decontamination**. Double-clicking a section's icon on the home page takes a user into that section. Once in the section the user can read a brief introduction on E-Z-EM's involvement in that particular business area and then see what products are available. The Resource Materials icon, available in each section, contains downloadable PDFs of brochures, white papers, case studies, etc., should the user want more detailed information on a particular product. Streaming video is also available for certain products.

The **CT Imaging** section features information on E-Z-EM's vast array of CT oral contrasts, as well as full product information on our award-winning family of injectors. The **Virtual Colonoscopy** section highlights our exclusive, complete product set which includes; patient preparation, fecal tagging, procedure and analysis, CME training and marketing support. The **Speech Pathology** section features information on our unique line of oral contrasts designed exclusively for use in swallowing studies. The **Gastroenterology** section focuses on our innovative devices, endoscopy accessories and patient preparation systems. Finally, the **Healthcare Decontamination** section covers our latest venture – products designed to protect military and other emergency service personnel.

A full product catalog is available by clicking on the Product Catalog link on the site's home page. The home page also includes Latest News & Events, Case of the Month and Featured Product sections. These areas are dynamic and will be updated periodically, encouraging users to visit the site more than once. The Clinical Results section will include a bibliography of important papers and other resources.

It is hoped that our new site will prove informative and educational and will draw repeat traffic from its users. Judge for yourself. We encourage you to come visit us at www.ezem.com today, and don't forget to send us your feedback and comments. We want our site to be a valuable resource for you.

Sincerely,

Brad S. Schreck

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