CONGENITAL CARDIOLOGY TODAY

Timely News and Information for BC/BE Congenital/Structural Cardiologists and Surgeons

Volume 7 / Issue 2 February 2009 North American Edition

IN THIS ISSUE

Intraoperative "Hybrid" Stent Delivery Under Direct Vision Using Endoscopic Guidance by Ralf J. Holzer, MD MSc; Matt Sisk, RCIS; Alistair Phillips, MD ~Page 1

Camp Odayin Allows Children with Heart Defects to Have a "Normal" Summer Camp Experience

by Brandon Lane Phillips, MD ~Page 8

DEPARTMENTS

Medical News, Products and Information ~Page 9

CONGENITAL CARDIOLOGY TODAY

Editorial and Subscription Offices 16 Cove Rd, Ste. 200 Westerly, RI 02891 USA www.CongenitalCardiologyToday.com

© 2009 by Congenital Cardiology Today ISSN: 1544-7787 (print); 1544-0499 (online). Published monthly. All rights reserved.

Statements or opinions expressed in Congenital Cardiology Today reflect the views of the authors and sponsors, and are not necessarily the views of Congenital Cardiology Today.

Workshop IPC & ISHAC March 22-25, 2009 -Milano Convention Center Milan, Italy www.WorkshopIPC.com

Recruitment Ads: 5, 6, 9, 10

Intraoperative "Hybrid" Stent Delivery Under Direct Vision Using Endoscopic Guidance

By Ralf J. Holzer, MD MSc; Matt Sisk, RCIS; Alistair Phillips, MD

Case Report

A 19-year-old female patient was evaluated for surgical pulmonary valve replacement. She was born with Tetralogy of Fallot and underwent complete repair at about one year of age, which included patch closure of a ventricular septal defect (VSD), as well as placement of a transannular right ventricular outflow tract (RVOT) patch. She did not require any further surgical or transcatheter interventions and remained cardiovascularly asymptomatic at NYHA class I. However, on echocardiography and serial MRI assessments she developed increasing right ventricle (RV) size and reduction in RV function because of significant pulmonary insufficiency (PI).

An EKG documented right bundle branch block with a QRS duration of 124ms. MRI revealed RVEDVi of 103ml/m2 and RVESVi of 48ml/m2. The RV ejection fraction (RVEF) was 53% (compared to 57% 2 years prior) and the pulmonary regurgitant fraction was 52%. The MRI also documented a stenosis at the LPA origin, measuring at its narrowest 14mm. A 24-hour Holter recording did not document any evidence of atrial or ventricular arrhythmias. Based on echocardiography, RV pressures were estimated to be normal (TR

"...intraoperative 'Hybrid' stent delivery using direct visualization and endoscopic guidance is a fairly simple, quick, and effective procedure to allow accurate stent placement to treat proximal pulmonary arterial lesions in patients who require cardiopulmonary bypass surgery for pulmonary valve or conduit replacement. Close cooperation between surgical and interventional team is essential to facilitate a successful outcome."

2.4m/s). An exercise test revealed VO2 max of 22ml/kg/min. There were no ischemic changes during the exercise test.

She subsequently underwent combined transcatheter and EP evaluation in preparation of pulmonary valve replacement. This demonstrated normal RV pressures (25/9mmHg)



RECRUITMENT ADVERTISING IN CONGENITAL CARDIOLOGY TODAY

- Pediatric Cardiologists
- Congenital/Structural Cardiologists
- Interventionalists
- Echocardiographers
- Imaging Specialists
- Electrophysiologists
- Congenital/Structural Heart Failure Specialists
- Cardiac Intensivists

For more information and pricing: TCarlsonmd@gmail.com

Do you or your colleagues have interesting research results, observations, human interest stories, reports of meetings, etc. that you would like to share with the congenital cardiology community?

> Submit a brief summary of your proposed article to RichardK@CCT.bz

> The final manuscript may be between 400-4,000 words, contain pictures, graphs, charts and tables.

CONGENITAL CARDIOLOGY TODAY

3

February 2009



Figure 1. RV angiogram documenting a large dilated right ventricle. The right pulmonary artery appears to be unobstructed while the left pulmonary artery is not adequately profiled on this projection.



Figure 2. LPA angiography in LAO-cranial projection, documenting a kink of the proximal left pulmonary artery.

with a small 4mmHg peak systolic gradient to the LPA. There was no residual L-R shunt. Angiographic evaluation documented severe pulmonary insufficiency, a large dilated RV (Figure 1), as well as a fold in the proximal LPA (Figure 2). The LPA at its narrowest at the origin measured 11.8mm, with the poststenotic



Figure 3. Endoscopic evaluation of the LPA intraoperatively. The top image shows the pulmonary artery bifurcation. Of note is the ridge/fold at the LPA origin which is further depicted in the bottom picture (arrows).

dimension being 24.8mm, and the LPA at the hilum being 19.7mm. The findings were discussed with the cardiac surgical team and it was felt that the lesion would be best treated intraoperatively, possibly through patch augmentation, but more likely through intraoperative stent placement.

The patient was subsequently taken to the operating room and intraoperative inspection confirmed a kink of the proximal LPA (Figure 3). It was decided to proceed with intraoperative stent placement. A Stryker endoscope (Stryker, Kalamazoo, MI) was utilized to inspect the LPA proximal and distal to the kink, as well as to assess the distance to



SECTION ON CARDIOLOGY & CARDIAC SURGERY

CALL FOR APPLICATIONS

2009-2010 Research Fellowship Award



The grant will provide research support for advanced training to a promising young investigator who has demonstrated aptitude for basic science or clinical science research during their pediatric cardiology fellowship. Trainees in an accredited

U.S. pediatric cardiology or cardiovascular surgical training program are eligible.

In making its selection, a special committee will review submitted materials for scientific merit, clarity of presentation, likelihood of productivity by the investigator, and evidence of appropriate academic environment by the sponsor. The recipient will receive a grant-inaid of \$35,000 and will be invited to present this work at the American Academy of Pediatrics National Conference and Exhibition in San Francisco in 2010.

SUBMISSION DEADLINE: FEB. 15, 2009

For more information or to obtain a copy of the application forms, visit: www.aap.org/sections/cardiology/RFA announcements.htm

Or write/ call to: AAP Section on Cardiology & Cardiac Surgery 141 Northwest Point Boulevard Elk Grove Village, IL 60007 Icolegrove@aap.org (800) 433-9016 ext. 7820

The Research Fellowship Award is made possible by an educational grant from the Helen and Will Webster Foundation.





Working Together to Develop a Better Tomorrow

February 2009

CONGENITAL CARDIOLOGY TODAY



Need to Recruit a Pediatric Cardiologist?

Advertise in Congenital Cardiology Today, the only monthly newsletter dedicated to pediatric and congenital cardiologists.

Reach the most Board Certified or Board Eligible pediatric cardiologists throughout the U.S. and Canada.

Recruitment advertising includes full color in either the North American print edition or the electronic PDF International edition.

Available in 1/3 and 1/2 page vertical Recruitment ad sizes. We can even create the ad for you at no extra charge!

For more information contact:

Tony Carlson, Founder CONGENITAL CARDIOLOGY TODAY Tel: +1.301.279.2005 TCarslonmd@gmail.com

case reviews in



4

Figure 4. Endoscopic evaluation of the left pulmonary artery, documenting the lobar branching.

the origin of the left upper lobe branch (Figure 4). Under endoscopic guidance, a standard .035" guidewire was placed in the left lower lobe branch pulmonary artery. A 26mm Max LD stent was mounted on a 22mm*3cm BiB balloon catheter (NuMED, Hopkinton, USA), and the assembly advanced over the guidewire across the stenotic lesion. Using continuous visualization with endoscopic guidance, the inner balloon was inflated and the stent position adjusted. This was followed by inflation of the outer balloon. The balloon was deflated and removed and subsequent endoscopic evaluation documented excellent stent position with complete relief of the obstruction, and sufficient distance to any lobar branch pulmonary arteries. Finally, the edges of the stent were 'crimped' manually to allow a 'smooth' entrance into the LPA and avoid any luminal protrusion of stent meshwork (Figure 5).

Following intraoperative stent placement, a 21mm bovine pericardial valve was implanted. The patient was separated from cardiopulmonary bypass without difficulty and extubated in the operating room. She was discharged home five days following the procedure.

Discussion

Intraoperative 'Hybrid' stent delivery is an important treatment alternative to transcatheter stent therapy and surgical



Figure 5. After stent deployment, endoscopic evaluation documents sufficient distance of the stent from lobar branching of the LPA (top image). The LPA appears to be wide open and the middle images shows the stent being 'crimped' over the crest between LPA and RPA. The bottom image shows the LPA origin from a distance, with the vessel being widely patent (note the difference from the pre-procedural images).

free on-demand webcast specifically designed for clinicians treating patients with patent ductus arteriosus

www.5StarMedEd.org/pda-cases

CONGENITAL CARDIOLOGY TODAY

5



Figure 6. Advantages and disadvantages of intraoperative 'Hybrid' stent delivery under direct visualization and endoscopic guidance, when compared to a transcatheter approach.

patch angioplasty. Techniques and equipment available to perform intraoperative stent placement have expanded considerably [1-4]. While surgical patch augmentation has distinct advantages to treat very calcified proximal stenotic lesions, it is less suited to deal with kinked vessels or external obstructions. The choice between intraoperative and transcatheter stent placement has to be made individually for each specific patient, and is often dependent on operator preference. However, there are very distinct advantages and disadvantages of "Hybrid" stent therapy when compared to transcatheter therapy, which should guide any individualized approach (Figure 6).

Intraoperative stent placement can be performed using either direct visualization with endoscopic guidance, which is the preferred treatment in patients who require cardiopulmonary bypass to address associated lesions, or in the beating heart using intraoperative angiographic guidance and direct stent delivery through a sheath inserted into the main pulmonary artery. We recently published a study of 20 patients who underwent "Hybrid" stent delivery in the pulmonary circulation [5], where direct visualization with endoscopic guidance was used in 75% of patients during stent delivery.

In most patients, the decision to perform intraoperative stent delivery does not eliminate the need for a pre-procedural angiographic evaluation. Cardiac catheterization not only provides important hemodynamic information, but also gives accurately calibrated measurements as well as possible landmarks that can be used for stent delivery.



PEDIATRIC CARDIOLOGIST Tucson, Arizona

Due to expansion we are seeking a third BC/BE Pediatric Cardiologist to join our Tucson practice. Our practice is part of a 17-member group with offices in the Phoenix and Tucson metropolitan areas. For the Tucson practice we are recruiting a generalist with experience in echocardiography, including transesophageal and fetal echo. And, it would be helpful but not essential if one is able to do simple diagnostic catheterizations. In the spring of 2009 we will be moving into a new state-of-art office located a half mile from the main hospital. In addition to our main office, we also see patients in several satellite offices. We cover two main private hospitals and one university hospital.

The Phoenix and Tucson practices are both engaged in clinical research and cover teaching rotations for residents and medical students. Receive a competitive income and outstanding benefits including health, life and disability insurances, paid malpractice insurance and CME allowance.

Tucson has more than 27,000 acres of parks, nearly 40 golf courses and, in addition to boating and fishing, is only 35 miles from snow skiing. With the feel of a small town, but all the amenities of a major city, Tucson is the number one resort destination in the Southwest.

Arizona Pediatric Cardiology Consultants is an affiliate of Obstetrix Medical Group, Inc.

For information, please contact Lori Abolafia, Physician Relations Specialist lori_abolafia@pediatrix.com

> Pediatrix Medical Group 1301 Concord Terrace Sunrise, FL 33323

800-243-3839 ext. 5209 www.obstetrix.com/apcc



RUSH UNIVERSITY MEDICAL CENTER

CHICAGO Rush University Medical Center Pediatric Cardiologist

The Department of Pediatrics in conjunction with the Center for Congenital and Structural Heart Disease at Rush University Medical Center, is seeking to recruit junior to mid level candidates for Pediatric Cardiology.

Board eligible/certified in pediatric cardiology, board Certified in Pediatrics with interest in Fetal Echocardiography, Intracardiac Echocardiography and interventional cardiology. It is essential that candidate is an expert in TEE in the OR and in the interventional cath lab setting including hybrid procedures. Strong clinical research background and experience in teaching residents and medical students are required. Candidates will be expected to drive to attend satellite clinics in the Chicago metro area and its suburbs.

This recruitment is part of a key strategic growth initiative in a multidisciplinary advanced congenital/structural cardiology program with state of the art mechanical support and clinical trials. Experience in clinical research is desirable. Rush is home to one of the first medical colleges in the Midwest and one of the nation's top-ranked nursing colleges, as well as graduate programs in allied health, health systems management and biomedical research.

Rush is an Equal Opportunity Employer.

Please contact:

Courtney Kammer Director, Faculty Recruitment Rush University Medical Center 312-942-7376 Courtney_Kammer@rush.edu



Figure 7. Stryker endoscope used for 'Hybrid' stent delivery under direct vision. The endoscope can be helpful in assessing the distance towards the origin of the pulmonary arterial side branches.

MRI data alone is frequently not sufficient to select the most appropriate stent and balloon size. In a recent evaluation of patients undergoing elective catheterization prior to PVR (unpublished), we found that the angiographically calibrated dimensions of stenotic vascular lesions differed by more than 2mm from MRI data in 75% of patients who required subsequent stent therapy. While some of this information could be obtained through intraoperative angiography, in most cases it is more practical to obtain this data during a separate catheterization procedure prior to the surgical intervention. This facilitates intraprocedural communication between cardiothoracic surgeon and interventional cardiologist, which allows an informed management decision at a time when all three treatment options (surgical patch, "Hybrid" stent, transcatheter stent) are still available.

The largest group of patients undergoing intraoperative stent placement under direct vision using endoscopic guidance are those with repaired Tetralogy of Fallot or PAVSD, who require pulmonary valve replacement and who have an associated isolated proximal pulmonary artery stenosis or kink [5;6]. While stent placement in the catheterization laboratory is certainly feasible, it frequently is a more time-consuming undertaking, when compared to stent implantation under direct vision. Stents are frequently expanded to large diameters, requiring long (frequently non-reinforced) sheaths, stiff wires and accurate stent positioning may be more difficult to attain. While stent implantation under direct vision offers a much simpler approach, a few technical considerations are important for a successful result. One of the biggest advantages of transcatheter stent implantation is accurate visualization of pulmonary arterial side branches in relation to the distal end of the stent. During intraoperative stent placement, the endoscope is a perfect tool to measure the distance to the first side branch (Figure 7), as well as to allow placing a wire into a larger, usually lower lobe pulmonary

07

International Workshop on Interventional Pediatric Cardiology



Workshop IPC & ISHAC - March 22-25, 2009 - Milano Convention Center, Milan, Italy www.WorkshopIPC.com 7

arterial branch. It is important to avoid the temptation to deploy the stent without a wire, as the position of the distal end cannot be reliably assessed during balloon inflation. The tip of the balloon can easily slip into a smaller side branch. This may result not only in jailing of other branches, but also potentially lead to vascular injury, if stent and/or balloon are inflated within a small vessel.

Stents deployed under direct vision can even be shortened manually if the stenotic lesion is very short [3], an approach not recommended for transcatheter stent delivery. Furthermore, after stent deployment, the stent edges can be folded/ crimped by the surgeon (Figure 5), which avoids any luminal protrusion of stent meshwork. This can be a significant benefit if the stent has to be entered in the future using a transcatheter approach. Stent delivery under direct vision in the operating room is more forgiving vis a vis technical problems such as balloon rupture or stent migration, and a suboptimally deployed or not fully expanded stent can usually be removed without great difficulty. Even though intraoperative stent placement can be readily assessed using endoscopy, a completion angiogram prior to coming off cardiopulmonary bypass, may be helpful to further evaluate the result of intraoperative stent placement.

In conclusion, intraoperative 'Hybrid' stent delivery using direct visualization and endoscopic guidance is a fairly simple, quick, and effective procedure to allow accurate stent placement to treat proximal pulmonary arterial lesions in patients who require cardiopulmonary bypass surgery for pulmonary valve or conduit replacement. Close cooperation between surgical and interventional teams is essential to facilitate a successful outcome.

References

 Mitropoulos FA, Laks H, Kapadia N et al. Intraoperative pulmonary artery stenting: an alternative technique for the management of pulmonary artery stenosis. Annals of Thoracic Surgery 1342;84:1338-41.

- Zartner P, Cesnjevar R, Singer H, Weyand M. First successful implantation of a biodegradable metal stent into the left pulmonary artery of a preterm baby.[see comment]. Catheterization & Cardiovascular Interventions 2005;66:590-4.
- Ing FF. Delivery of stents to target lesions: techniques of intraoperative stent implantation and intraoperative angiograms. [Review] [11 refs]. Pediatric Cardiology 2005;26:260-6.
- Bokenkamp R, Blom NA, De Wolf D, Francois K, Ottenkamp J, Hazekamp MG. Intraoperative stenting of pulmonary arteries. European Journal of Cardio-Thoracic Surgery 2005;27:544-7.
- Holzer RJ, Chisolm JL, Hill SL et al. "Hybrid" stent delivery in the pulmonary circulation. Journal of Invasive Cardiology 2008;592-8.
- Mitropoulos FA, Laks H, Kapadia N et al. Intraoperative pulmonary artery stenting: an alternative technique for the management of pulmonary artery stenosis. Annals of Thoracic Surgery 1342;84:1338-41.

CCT



Ralf J. Holzer, MD, MSc Assistant Director, Cardiac Catheterization & Interventional Therapy Assistant Professor of Pediatrics Cardiology Division The Ohio State University The Heart Center Nationwide Children's Hospital 700 Children's Drive Columbus, OH 43205, USA Tel: 614 722-2537; Fax: 614 722-5030 ralf.holzer@nationwidechildrens.org Matt Sisk, RCIS The Heart Center Nationwide Children's Hospital 700 Children's Drive Columbus, OH, USA

Alistair Phillips, MD The Heart Center Nationwide Children's Hospital Department of Surgery, Ohio State University School of Medicine Columbus, OH, USA

LIVE CASES AT THE UPCOMING: WorkshopIPC & ISHAC March 22-25 - Milan, Italy

This Case Report article Illustrates a good example of the type of 'live' case that Drs. Ralf Holzer and Alistair Phillips will be performing at the joint meeting of *Workshop IPC & ISHAC* (International Symposium on the Hybrid Approach to Congenital Heart Disease) in Milan, Italy, this March 22-25, 2009.

There will be a total of 23 live cases performed by well-known physicians from all over the world at the joint meeting this year. For more information about attending *WorkshopIPC & ISHAC* visit: www.WorkshopIPC.com

You may also watch selected live cases, hosted by Congenital Cardiology Today, from the 2007 and 2008 *ISHAC* meetings. These include:

- NCH Hybrid Catheterization/OR Suites
- Pulmonary Artery Flow Restrictors
- Transcatheter Valve
- Intra-operative PA Stent
- Perventricular Muscular VSD Device Closure
- Closure of Septal Defect Using Real Time 3D Echo Guidance
- High Frequency Ultrasound Creation of ASD
- And more...

In addition, there are live cases from past *PICS-AICS* and *WorkshopIPC* meetings. To view these lives cases online, visit: www.CHDVideo.com



www.bbraunusa.com



Working Together to Develop a Better Tomorrow

Camp Odayin Allows Children with Heart Defects to Have a "Normal" Summer Camp Experience

By Brandon Lane Phillips, MD

Camp Odayin provides overnight, day and family camps. A typical day at residential camp starts with a Polar Bear swim and is followed by warm up stretches at the flag pole. It's then off to grab a quick breakfast before the day's adventures begin. Throughout the morning, campers and staff participate in activities such as: arts and crafts, canoeing, horseback riding, rope challenge course, and archery to name just a few. In the afternoon, all campers participate in waterfront activities. Swimming, leisurely boat rides, and water skiing are some of the offerings. Each evening meal is followed by a surprise activity ranging from making s'mores and singing crazy songs by a camp fire to watching your new friends sing (or share whatever special skill they feel they possess) during the talent show. The day is concluded with sharing stories in the cabin before bedtime.

Camp Odayin is much like your typical summer camp in a lot of ways, except it is different in one very important way --- all of the campers have a heart defect. Children with cardiac conditions are sometimes excluded from summer camps due to their medical needs. Camp Odayin was specifically created eight years ago to allow children with heart defects to have a "normal" summer camp experience while ensuring their medical needs are met. This past summer I spent a week with 75 teenage campers as one of Camp Odayin's volunteer cardiologists. I was privileged to work with a wonderful team of volunteer counselors and nurses whose main goal was to give these kids a week they would never forget.

Many children with chronic medical problems feel isolated --- they think they are the only one with their medical condition. It was interesting watching the campers compare scars and share experiences. They have a very unique bond from the start. It did not take long for them to find old friends or make new ones. Some children with congenital heart defects find it easier to sit on the sidelines of life. They choose not to participate in many activities because they have a fear of not being able to run as hard or perform as well as their peers who do not have cardiac conditions. Many campers are willing to try activities that they typically would not while at camp. They feel comfortable trying activities such as canoeing, horseback riding, archery, or water skiing for the first time because they are surrounded by others who understand their fears. One of the things



that impressed me most is how these kids encourage each other. The self-confidence these campers learn at Camp Odayin will serve them well throughout life.

Camp Odayin only requires a \$25 registration fee of a family to send a child to camp. All other expenses of camp are covered by donations and fundraisers throughout the year. I have volunteered at other camps for children with cardiac defects. Some of them charge as much as \$1,500 for a single ses-



sion of camp. Camp Odayin's low cost to families makes it possible for most children who are medically eligible for camp to attend.

I am not just a physician, but I am a physician who has a congenital heart defect, so I know first hand the isolation a child with a heart defect can feel. It has always been my desire to help my patients with the psychological aspects of having a medical condition. Many of the campers cried when their week at camp came to an end. It is obvious that Camp Odayin is a place where they feel loved and accepted. Since returning from camp, I have begun to tell my patients about Camp Odayin --- it is another tool I can use to help my patients grow into normal, healthy adults.

To learn more about Camp Odayin, visit www.campodayin.org or call 1.866.9.ODAYIN (1.866.962.2946).

ССТ

Brandon Lane Phillips, MD Instructor-in-Pediatrics, College of Medicine Fellow, Division of Pediatric Cardiology Mayo Clinic

Phillips.Brandon@mayo.edu



PEDIATRIC **CARDIOLOGISTS**

PHOENIX: the Perfect Blend of Lifestyle and Work

Known as "the Valley of the Sun," Phoenix offers numerous cultural, recreational and sporting events along with a strong, vibrant economy. Live in a family-oriented community with excellent school districts and unlimited activities for children. Hike in nearby mountains or play in the surf along the California coast. Advance your career as part of our 17-member group, providing the full spectrum of congenital cardiac services in one of the fastest growing metropolitan cities in the nation.

Arizona Pediatric Cardiology Consultants is seeking three BE/BC Pediatric Cardiologists to join our rapidly expanding practice in Phoenix:

- · Generalist: Provide outpatient services in one of our community-based offices; strong interpersonal and clinical skills required.
- · Director of Echocardiography: Experience required in all aspects of echocardiography; must have leadership and research capabilities.
- Transplant/Heart Failure Specialist: Pilot a program with the transplant surgeons at Phoenix Children's Hospital and the Mayo Clinic.

Our practice is recognized as the primary pediatric cardiology group at Phoenix Children's Hospital. We provide all inpatient cardiology care. including transthoracic and transesophageal echocardiography, catheter interventions, electrophysiology/RFA and MRI procedures. Our group is truly unique, providing our practitioners with cutting-edge technology and academic affiliation in a private practice setting.

As one of our clinicians you will also enjoy:

- 401(k)
- Professional liability insurance
- Comprehensive health/life benefits
- CME allowance Competitive salaries
- Clinical research opportunities
- Relocation assistance Stock purchase plan

For more information regarding this opportunity, please contact:

Lori Abolafia 800.243.3839, extension 5209 Email: lori_abolafia@pediatrix.com Fax: 800.765.9859 www.azkidsheart.com

Arizona Pediatric Cardiology Consultants is an affiliate of Pediatrix Cardiology Specialists



An Equal Opportunity Employer

Medical News, Product and Information

Epocrates Survey Identifies Trends in Online Resource Use Among Physicians

A new survey released this November reveals physicians are accessing online clinical resources more than ever, and 75% prefer to obtain information from professional websites rather than through Internet searches. Epocrates, Inc., developer of mobile and online decision support resources, conducted this nationwide survey to evaluate the impact online resources have on patient communication and care.

More than 500 physician respondents confirmed that online resources help improve patient safety, provide patients up-to-date information and even save patients money, which is crucial in this economic climate. The survey found that through online resources, such as Epocrates Online (www.epocrates.com/online/?CID=PROnline), physicians are:

- Making technology a part of the consultation Today's doctors are using technology to check drug dosing, side effects, interactions or treatment guidelines during patient visits. Nearly 50% of physicians report they most frequently use the Internet during patient consultations, rather than between patient visits or after hours.
- Enhancing patient visits Nearly 90% of physicians strongly agreed or agreed that accessing clinical information online improves patient satisfaction and communication. Specifically, physicians reported the use of an online resource helped:
 - · increase medication compliance
 - · decrease pharmacy callbacks
 - patients appear more at ease
 - some patients disclose information physicians would have not otherwise known
- Saving money with generics 70% of physicians have prescribed a lower cost or generic medication for a patient in the last month using the drug pricing or coverage features available on Epocrates Online. Furthermore, one-in-five physicians report saving their patients money 10 or more times in the four-week period.

Technology is becoming more prevalent in clinical practices, with 97% of survey respondents reporting computer access at their practice or institution, and more than 50% working at a wireless facility. Approximately 75% of physicians report going online more today than a year ago. More than 70% go online for clinical information at least once a day, of which nearly 20% report using web-based resources five or more times per day.

Quintet of Proteins Forms New, Early-Warning Blood Test Before Heart Attack Strikes

Newswise — A team of Johns Hopkins biochemists has identified a mixed bag of five key proteins out of thousands secreted into blood



32nd Annual Scientific Sessions

May 6-9, 2009 • Caesars Palace, Las Vegas

Featuring Live Cases, Tracks in Pediatric and Structural Heart Disease and Much Morel REGISTER NOW at www.scai.ora



9

PEDIATRIC CARDIOLOGIST Fairfax, Virginia

Exciting opportunity available for a BC/BE Pediatric Cardiologist to join a team dedicated to providing quality pediatric cardiology care in the Northern Virginia, Maryland, and Washington, D.C. areas. At Child Cardiology Associates, we specialize in the care of the fetus, infant, child and adolescent with congenital and acquired heart disease. Many adult patients with congenital heart disease choose to continue under our care, where we combine the roles of diagnostician, teacher, counselor, and consultant. We maintain admitting privileges in pediatric cardiology at Inova Fairfax Hospital for Children, and we are available for consultation at all area hospitals, as well as in more than 15 satellite locations. Fairfax is located in Northern Virginia on the outskirts of Washington, D.C. - only a short drive from the Nation's Capital with its monuments, museums, The John F. Kennedy Center for Performing Arts, plus a wide variety of cultural, professional sports and entertainment opportunities.

Child Cardiology Associates is an affiliate of Pediatrix Medical Group, Inc. Pediatrix offers competitive salaries and an excellent benefits package including health, disability, and liability insurances; employee stock purchase program; 401(k); and CME.

For additional information, please contact

Ron Grattan, Physician Relations Specialist ron_grattan@pediatrix.com Pediatrix Medical Group 1301 Concord Terrace, Sunrise, FL 33323 800.243.3839, ext. 5635

Child Cardiology Associates 8318 Arlington Boulevard, Suite 250, Fairfax, VA 22031

www.childcardiology.com www.pediatrix.com

draining from the heart's blood vessels that may together or in certain quantities form the basis of a far more accurate early warning test than currently in use of impending heart attack in people with severely reduced blood flow, or ischemia.

The work, involving more than a dozen scientists and taking more than a year to perform, is believed to be the largest protein analysis ever done at Hopkins. It was based on 76 arterial blood samples from 19 men and women taken immediately before and after a period of medically induced ischemia lasting as long as 45 minutes.

All had ischemia induced through accelerated pacing of the heart's main chambers. Blood samples were provided by cardiologists at the University of Texas Southwestern.

Key to the researchers' selection criteria of which proteins to analyze from among tens of thousands in the blood was what they call "a pipeline approach."

"From the start, we knew that we were looking for rare, almost unique biomarkers that bore some direct relationship with ischemia," says study senior investigator Jennifer Van Eyk, PhD, whose first step was to remove from the analysis common blood proteins, such as albumin and globulins. That left batches of 400 proteins for in-depth measure of any changes before and after ischemia.

Their analysis, which was presented at the American Heart Association's (AHA) annual Scientific Sessions in New Orleans, found that only the five proteins were present in significantly increased amounts after ischemia occurred, with at least a doubling in the blood concentration, compared with those recorded during healthy blood flow. These were lumican, semenogelin, angiogenin, extracellular matrix protein, and so-called long palate, lung and nasal epithelium carcinoma-associated protein 1.

All of the proteins are believed to originate in the heart, but they can also be found in other tissues varying from the corneas of the eyes (lumican) to semen. Semenogelin, as it is known, has never before been seen in the heart, while others, such as angiogenin, are more predictably found in growing blood vessels and muscle tissue, and are actively involved in tissue repair. Little is known about the remaining two, which, ironically, have the longest names: extracellular matrix protein, secreted in a rare inflammatory disease; and long palate, lung and nasal epithelium carcinoma-associated protein 1, thought to play a role in innate immunity.

The Johns Hopkins biochemists say the presence of all or even a selected set of these proteins in a simple, rapid blood test could aid emergency paramedics and physicians during the critical 12-to 24-hour window before ischemia causes substantial heart tissue damage or death from heart attack.



10

February 2009

A positive reading on a blood test incorporating these proteins, they add, could provide first responders with advance warning to take urgent action, such as using blood thinners like aspirin to prevent clotting, or performing cardiac catheterization to check for any more blockages in the blood vessels feeding the heart, which may in turn prompt more aggressive treatment. Further actions could involve angioplasty, in which a balloon device is threaded into the heart's surrounding blood vessels and then expanded to widen the arteries, or even surgery.

"Our results lay the foundation for a firstof-a-kind, early-warning system that could save tens of thousands of people on the brink of a heart attack," says Van Eyk, a professor at the Johns Hopkins University School of Medicine and its Heart and Vascular Institute. "People experiencing chest pain too often come to the emergency room, with subsequent electrocardiogram, also called EKG, readings not showing any evidence that a heart attack has occurred, but still leaving open the question of whether or not a heart attack is imminent and about to happen or has already happened," adds Van Eyk, Direc-tor of the Johns Hopkins NHLBI Proteomics Group and the Proteomics Center at Johns Hopkins Bayview Medical Center, where the protein analysis took place.

Van Eyk says people frequently have symptoms of chest pain, shortness of breath and dizziness, with pale or clammy skin coloring, while arterial blood is constricted but not yet closed. But this myriad of complaints can just as easily be mistaken for the more everyday, less-serious problems of heartburn, stomach cramps or gas. In 2006, the US Centers for Disease Control and Prevention reported more than 12,000 visits to doctors' offices and emergency rooms by people complaining of chest pain.

A new test based on these five proteins, says Van Eyk, could provide a "more definitive answer" to the question "how serious is it?" much earlier than existing assays for heart attack, such as tests for troponin proteins I and T.

Van Eyk says commercially available tests for cardiac troponin, which is released into the blood in telltale patterns for heart attack, provide results "too late to take preventive action," and "after some damage has already occurred." Troponin lab tests also depend on the heart muscle dying first, which can take hours to detect, "So a negative reading is unreliable and can still mean that an ischemic problem is about to happen or has already happened," she says.

11

In the study, the protein analysis was conducted by mass spectrometry machines that can measure the presence of proteins in minute amounts. The machines, operated six days a week for six months, consumed more than 3,700 hours of spectrometric analysis.

Researchers next plan to verify the presence of the five proteins in a larger study with at least 150 participants, and more than 1,000 blood samples. Simultaneously, they plan further analysis of the proteins to map their molecular structures, so that an antibody can be identified to bind to one or several of the proteins, laying the basis for a blood test for ischemia. And they will conduct tests to verify that their study findings also apply to ischemia in stroke.

Funding support for this study was provided by Inverness. The technology development in the study and the "pipeline approach" were supported by the Johns Hopkins Bayview Proteomics Center. The Johns Hopkins NHLBI Proteomics Group is one of 10 centers funded as part of the US, seven-year program dedicated to the study of proteomics and understanding the functions of proteins in the development of cells, tissues and organisms, in both normal and disease processes. Van Eyk has a patent pending on the protein analysis. Under an option agreement with The Johns Hopkins University, Inverness Medical Innovations' Unipath Ltd., in Bedford, United Kingdom, has the right to negotiate a license to the patent.

Other Johns Hopkins researchers who took part in this study were Qin Fu, PhD; Simon Sheng, MSc; Steven Elliott, MSc; and Miroslava Stastna, PhD. Additional support was provided by James de Lemos, MD, at the University of Texas Southwestern.

For more information: www.proteomics.jhu.edu/index.php?id=248

Do you or your colleagues have interesting research results, observations, human interest stories, reports of meetings, etc. that you would like to share with the congenital cardiology community?

Submit a brief summary of your proposed article to Congenital Cardiology Today at RichardK@CCT.bz

CONGENITAL CARDIOLOGY TODAY

© 2009 by Congenital Cardiology Today (ISSN 1554-7787-print; ISSN 1554-0499online). Published monthly. All rights reserved.

Headquarters

9008 Copenhaver Dr. Ste. M Potomac, MD 20854 USA

Publishing Management

Tony Carlson, Founder & Editor TCarlsonmd@mac.com Richard Koulbanis, Publisher & Editor-in-Chief RichardK@CCT.bz John W. Moore, MD, MPH, Medical Editor/ Editorial Board JMoore@RCHSD.org

Editorial Board

Teiji Akagi, MD Zohair Al Halees, MD Mazeni Alwi, MD Felix Berger, MD Fadi Bitar, MD Jacek Bialkowski, MD Philipp Bonhoeffer, MD Mario Carminati, MD Anthony C. Chang, MD, MBA John P. Cheatham, MD Bharat Dalvi, MD, MBBS, DM Horacio Faella, MD Yun-Ching Fu, MD Felipe Heusser, MD Ziyad M. Hijazi, MD, MPH Ralf Holzer, MD Marshall Jacobs, MD R. Krishna Kumar, MD, DM, MBBS Gerald Ross Marx, MD Tarek S. Momenah, MBBS, DCH Toshio Nakanishi, MD, PhD Carlos A. C. Pedra, MD Daniel Penny, MD James C. Perry, MD P. Syamasundar Rao, MD Shakeel A. Qureshi, MD Andrew Redington, MD Carlos E. Ruiz, MD, PhD Girish S. Shirali, MD Horst Sievert, MD Hideshi Tomita, MD Gil Wernovsky, MD Zhuoming Xu, MD, PhD William C. L. Yip, MD Carlos Zabal, MD

FREE Subscription

Congenital Cardiology Today is available free to qualified professionals worldwide in pediatric and congenital cardiology. International editions available in electronic PDF file only; North American edition available in print. Send an email to Subs@CCT.bz. Include your name, title, organization, address, phone and email.

Contacts and Other Information

For detailed information on author submission, sponsorships, editorial, production and sales contact, current and back issues, see website or send an email to: INFO@CCT.bz.

REVEAL TISSUE PERFUSION

WITH SITE-SPECIFIC Saturation Data

Augment systemic data with noninvasive regional oxygen saturation (rSO₂) from up to four sites. Only the INVOS[®] Cerebral/Somatic Oximeter monitors oxygenation data from the brain and body simultaneously and continuously. This site-specific tissue perfusion can enhance your clinical assessment in a meaningful way and help detect ischemic problems earlier than traditional measures. This additional vital sign lets you intervene and put things right—before they escalate.

Visit Cardiology 2009 Booth #2 to learn more.

© 2009 Somanetics Corporation. Somanetics, INVOS and "Reflecting the color of life" are registered trademarks of Somanetics Corporation. US federal regulations restrict the sale of this device to, or on the order of, licensed medical practitioners.









The smallest lives often need the greatest access.

(Our Infinix[™]-i cath lab provides you the vital room to operate.)



The slender c-arms of our Infinix-I cath lab positioners were built with design input from leading pediatric clinicians, not just engineers in faraway laboratories. Those arms are intricate mechanisms that articulate into optimal positions, yet are simple enough to be driven with one hand. They can

be manuevered in the perfect place, out of the way but right where your team needs them for the best possible access to the patient. Discover how Infinix-i can provide the room you need to operate. Get more details at www.medical.toshiba.com.

TOSHIBA Leading Innovation >>>

Industry recognition for access and coverage validates the Infinix-i.



Whether for diagnostic, interventional or hybrid procedures, Toshiba Infinix-i represents the industry's broadest selection of systems, including the Infinix CF-i/BP biplane.



AWARDED FOR INNOVATION

Infinix[™] CF-i/BP cardiovascular biplane system has received the Frost & Sullivan 2007 North American Cardiovascular X-ray Technology Innovation Award.

"Currently, Toshiba is the only manufacturer to offer a system that can be manuevered in all angles, supporting the ability to do cardiac and peripheral work...Toshiba's significant contribution to the medical imaging market with its innovative, first-to-market 5-axis Infinix CFi-BP system ensures the ability to meet the needs of the cardiac population while staying abreast of the surging hybrid market."

- 2007 Frost & Sullivan award statement

For more information, please call (800) 421-1968 or visit us at medical.toshiba.com

