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TRANSCATHETER AMPLATZER ASD DEVICE CLOSURE OF LARGE PULMONARY ARTERIOVENOUS ANEURYSM

By Hala Agha, MD; Howaida El-Said, MD; Mohamed Abd El Rahman, MD; Mario Carminati, MD; and Seif Abaza, MD

Abstract

We report a rare case of a child who had a large localized pulmonary arteriovenous malformation with aneurysm that resulted in arterial desaturation after the surgical ligation of a patent ductus arteriosus (PDA). The excessive flow of intrapulmonary shunt was successfully eliminated by an Amplazter ASD occluder device that provided a sustained improvement of the oxygen saturation of the child. The work was carried out at the Pediatric Department, Children Hospital, Cairo University, Egypt.

Introduction

Pulmonary arteriovenous malformations (PAVMs) are direct connections between a branch of a pulmonary artery and a vein, creating a right-to-left shunt and leading to dyspnea, fatigue, and cyanosis. Serious neurologic complications such as stroke, transient ischemic attack, and cerebral abscess have been reported in 37% of patients [1,2]. The authors present a case of a localized huge PAVM successfully occluded with the use of Amplatzer ASD occluder device.

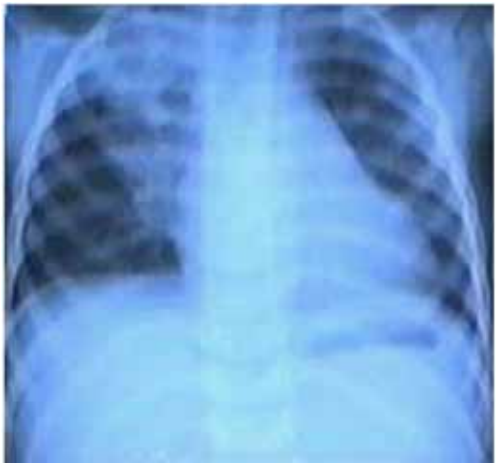

Figure 1. Chest x-ray showed right upper and middle lung zone irregular opacities, mid-line treachea and heart, and preserved costophrenic angles.

"Our patient had sustained improvement of his symptoms, arterial saturation, and exercise tolerance during six months of follow-up after Amplatzer ASD occluder of this huge PAVM with aneurysm.'"

Case Report

The patient was a 2-year-old boy with severe cyanosis. This severe desaturation was discovered immediately after surgical ligation of PDA. This finding was unexplained till chest X-ray showed right upper and middle zone lung irregular opacities (Figure 1). This was followed by Tc 99m-perfusion lung scan that revealed an abnormality of tracer uptake in the upper and middle right lobes. A gross pulmonary arteriovenous malformation was delineated by MRI. Conglomerate serpinginous and tortuous vessels were evident in right upper and middle zones. The distal venous end showed aneurysmal dilatation before entering the left atrium. The intial hemodynamic study during catheterization revealed normal pressures on the right heart structures and the oxygen saturation was 72%, then, bilateral pulmonary arteriography was performed. Left pulmonary angiography was normal, while right pulmonary angiogram confirmed the MRI findings

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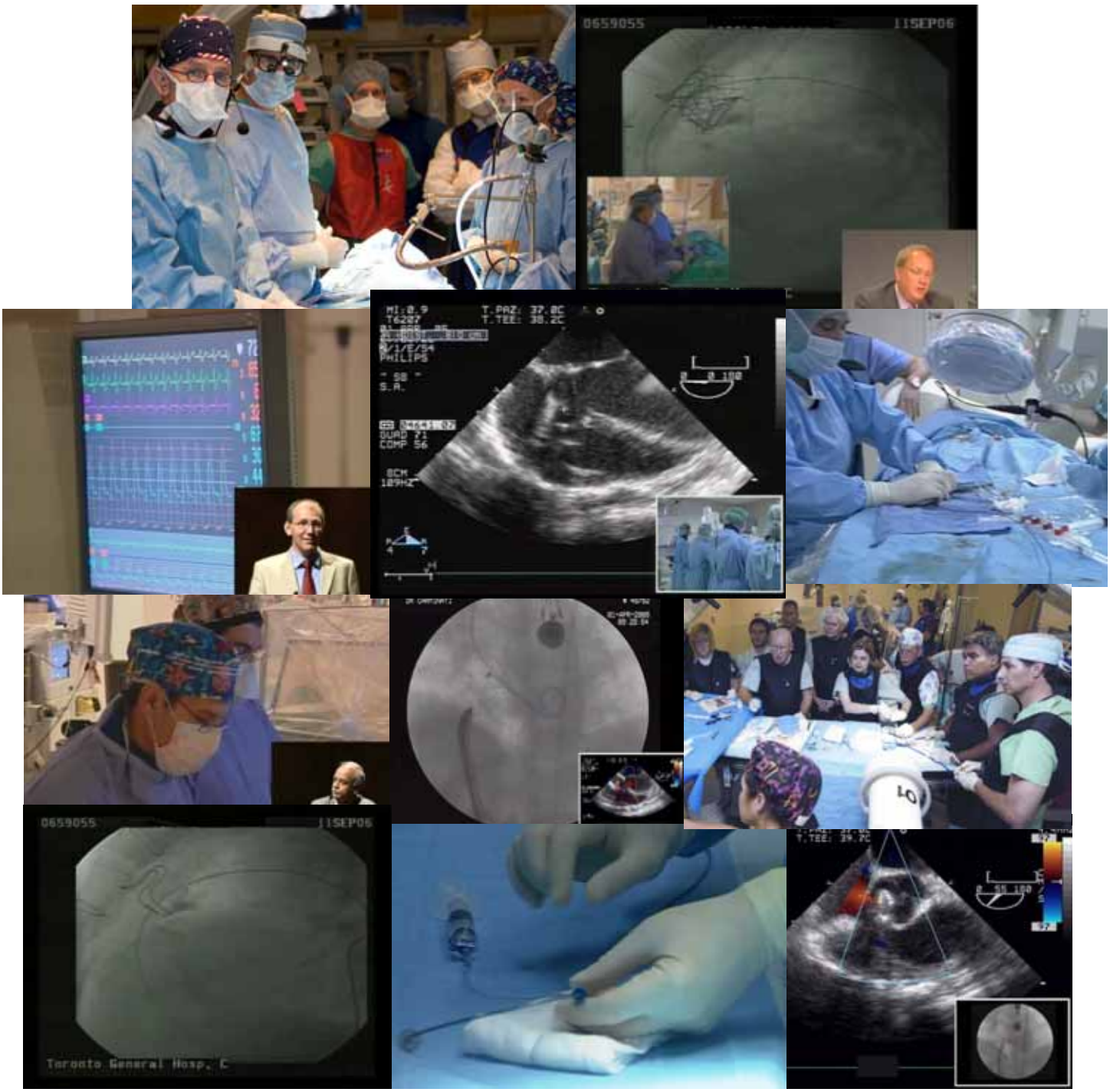

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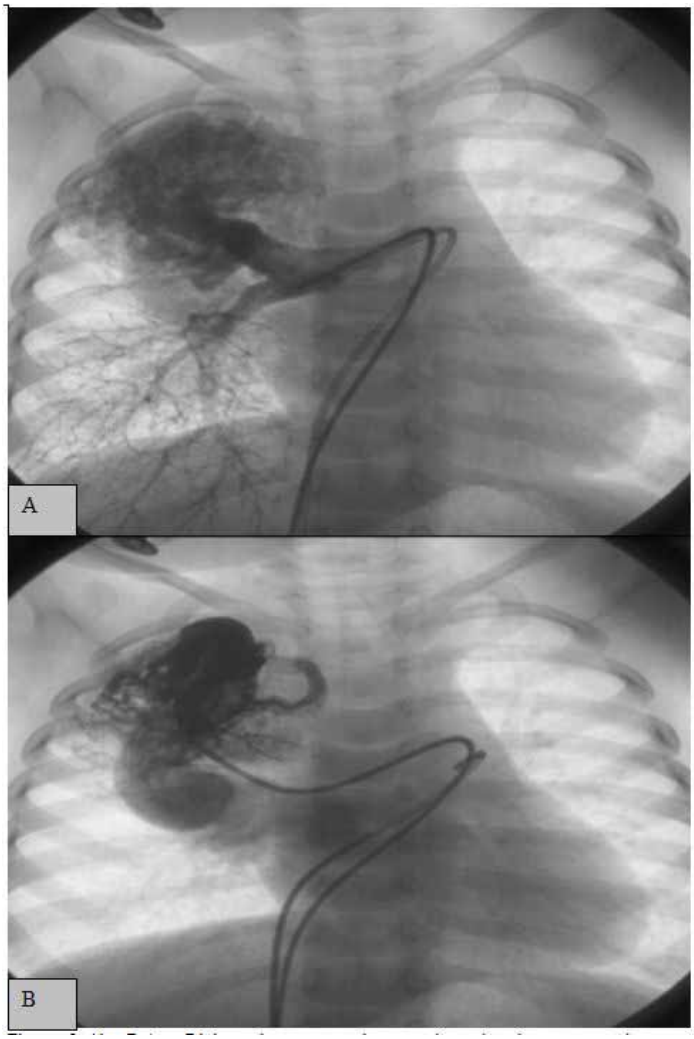

Figure 2. (A, B): Right pulmonary angiogram showed pulmonary arteriovenous malformation localized in the upper and middle zone. (A): There were multiple feeding vessels originating from right upper pulmonary artery. (B): There was aneurysmal dilatation in pulmonary venous return to the left atrium.

(Figure 2 - A, B). Amplatzer ASD occluder device (AGA Medical Corporation, Minneapolis, MN) [3] was used to occlude right upper pulmonary artery and its branches. Under general anaesthesia, bilateral venous cannulations were done by 6 F sheaths. A 6 F multipurpose catheter was inserted on the right side while a 6 F NIH catheter was placed on the left for angiographic information during manipulation of the device. The patient received a 50-U/kg bolus of heparin and an exchange 260cm J-tipped guidewire was advanced through the multipurpose catheter. The catheter was then exchanged for a 100-cm 8-F Mullins sheath (Cook, Bloomington, IN) for deployment of the Amplatzer device. The correct position of the delivery sheath was verified by a test injection of contrast medium. Amplatzer device (12mm) was screwed to the tip of the delivery cable, immersed in normal saline and drawn into

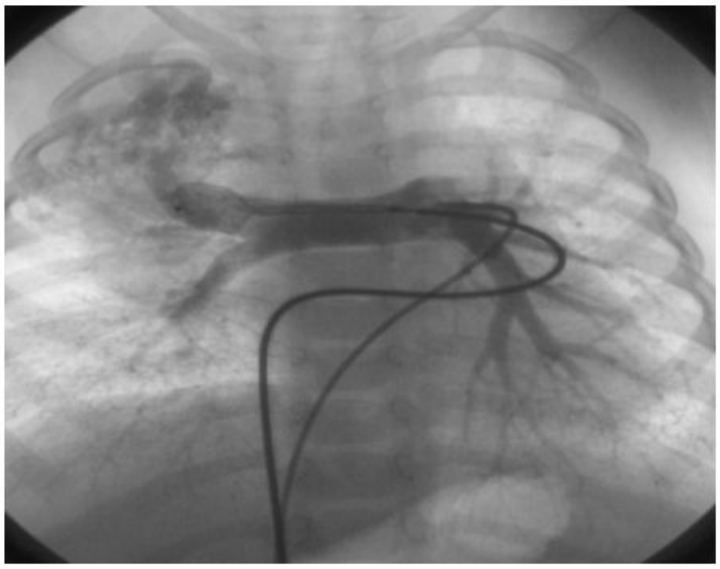

Figure 3. Pulmonary angiogram showed that the left atrial disc of the Amplatzer Septal Occluder was deployed.

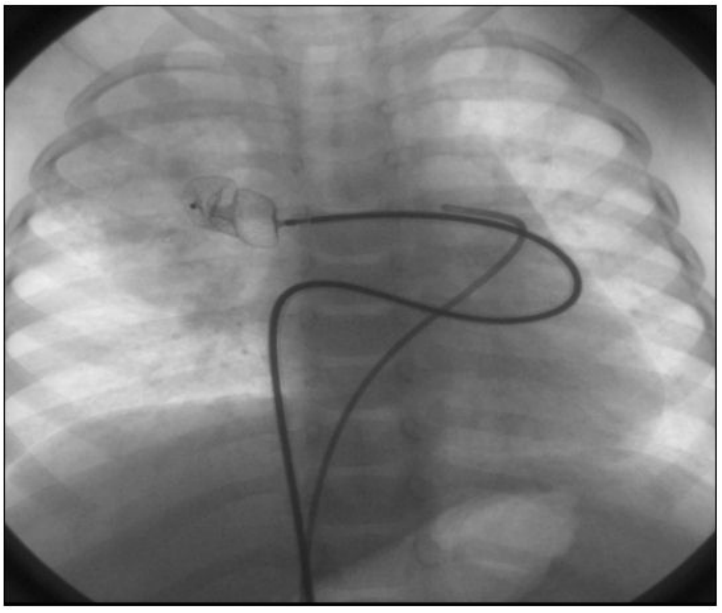

Figure 4. Under fluoroscopic guidance the ASD Amplatzer Septal Occluder device was released in its optimal position.

the loader. The loader with the collapsed device was then advanced into the guiding catheter by pushing the delivery cable. Under fluoroscopic guidance, the left atrial disc was deployed, using gentle tension on the delivery cable (Figure 3); the sheath was pulled back and the right atrial disc was deployed. Once its position was optimal, the device was released by counterclockwise rotation of the delivery cable (Figure 4). Ten minutes after release of the Amplatzer, a pulmonary angiogram was done by NIH catheter placed on the left side to detect any residual leak.

MEDICAL SYMPOSIUMS AND MEETINGS

17th Annual Course on Adult Congenital Heart Disease
May 30-June 2, 2007; Philadelphia, PA USA
www.philachd.org

ASE- 18th Annual Scientific Sessions (American Society of Echocardiography)
June 3-7, 2007; Seattle, WA USA
www.aescho.org

Heart Failure 2007
June 7-9, 2007; Hamburg, Germany
www.escardio.org

The 3rd Annual Toronto Symposium: Contemporary Questions in Congenital Cardiology Today
June 10-12, 2007; Toronto, Canada
www.sickkids.ca/cardicsymposium

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June 23-28, 2007; Geneva, Switzerland
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August 3-5 2007; Aspen, CO USA
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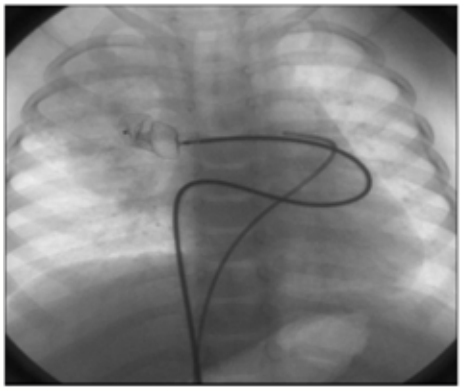

Figure 4. Under fluoroscopic guidance the ASD Amplatzer Septal Occluder device was released in its optimal position.

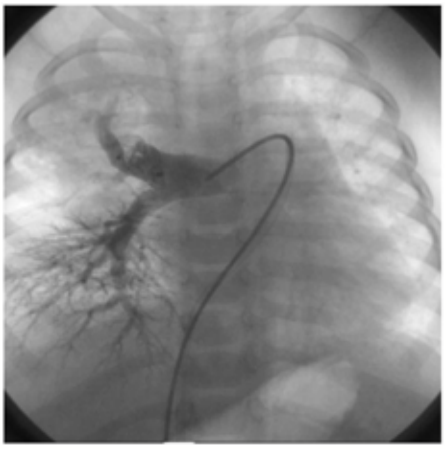

Figure 5. Pulmonary angiogram 10 minutes after release of Amplatzer ASD occluder device showed small residual leak from the right PAVM.

There was still minimal leak from the fistula (Figure 5), but the arterial saturation rose to 90% and remained stable during 24 hours. Over 6 months of follow-up, the patient's arterial saturation remained 90% and he was scheduled for MRI and possible treatment of his remaining smaller PAVMs.

Discussion

We postulated that the presence of the patent ductus arteriosus mitigated the patient's cyanosis because of increased blood flow through normal lung segments. Then, by interrupting the ductal flow, and as PAVMs are high-flow, low-resistance vascular shunts [4]; the full pathophysiological picture of this malformation became evident with a significant right to left intrapulmonary shunt. Transcatheter occlusion of congenital vascular malformations with a variety of occluding devices has been well described in both the pediatric and adult literature [5]. Very large PAVMs present technical problems and may be difficult to occlude with standard coils or detachable balloons [6]. Occluding the right upper pulmonary artery branch that supplied the diseased zone was decided because of the multiplicity of the feeding vessels of the PAVM and aneurysmal formation of the venous return. By this procedure, provocation of pulmonary infarction was intended in this upper right diseased lobe. Based on our center experience with Amplatzer ASD occluder device, the 12mm occluder device was selected as a useful treatment option because of its large size and, therefore, its presumably low embolization risk. Amplatzer ASD device occlusion of PAVM proved to be technically easy and well tolerated without any complications. The procedure necessitated the use of an 8-F sheath, which may be important when treating small patients. According to our review of the literature, this is first reported case of PAVM occluded by Amplatzer ASD device, while Bialkowski et al, reported that large PAVMs were successfully occluded by the Amplatzer duct occluder (ADO), designed for the occlusion of patent duct arteriosus [7]. Although the risk of complications using the Amplatzer device cannot be ruled out, we believe that this procedure carries significantly reduced risk of paradoxic device embolization, especially in

the setting of large lesions and because of the size and configuration of this device. Our patient had sustained improvement of his symptoms, arterial saturation, and exercise tolerance during six months of follow-up after Amplatzer ASD occluder of this huge PAVM with aneurysm.

References

1. White RIJr, Pollak JS, Wirth JA. Pulmonary arteriovenous malformations: diagnosis and transcatheter embolotherapy. J Vasc Interv Radiol 1996; 7: 787–804.

2. Swanson KL, Prakash UB, Stanson AW. Pulmonary arteriovenous fistulas: Mayo Clinic experience 1982–1997. Mayo Clin Proc 1999; 74: 671–680.

3. Masura J, Gavora P, Formanek A, et al: Transcatheter closure of secundum atrial septal defects using the new self-centering amplatzer septal occluder: Initial human experience. Cath Cardiovasc Diagn 1997;42: 388,

4. P. Gupta1, C. Mordin, J. Curtis, J. M. B. Hughes, C. L. Shovlin2 and J. E. Jackson 1.Pulmonary Arteriovenous Malformations: Effect of Embolization on Right-to-Left Shunt, Hypoxemia, and Exercise Tolerance in 66 Patients. Am J Roentgenol 2002; 179:347-355

5. Ebeid MR, Braden DS, Gaymes CH, Joransen JA. Closure of a large pulmonary arteriovenous malformation using multiple Gianturco-Grifka vascular occlusion devices. Cathet Cardiovasc Interv 2000;49:426–429.

6. Saluja S, Sitko I, Lee DW, Pollak J, White RI Jr. Embolotherapy of pulmonary arteriovenous malformations with detachable balloons: long-term durability. Takahashi K, Tanimura K, Honda M, et al. Venous sac embolization of pulmonary arteriovenous malformation: preliminary experience using interlocking detachable coils. Cardiovasc Intervent Radiol 1999; 22: 210–213.

7. Bialkowski J, Zabal C, Szkutnik M, Montes JA, Kusa J, Zembala M. Percutaneous interventional closure of large pulmonary arteriovenous fistulas with the amplatzer duct occluder. Am J Cardiol 2005;;96(1): 127-129.

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- How to minimize radiation risk in the cathlab
- The last frontier of percutaneous coronary interventions in the drug-eluting stent era

All scientific sessions will be held in English, the official language of the Course.

MEDICAL NEWS, PRODUCTS AND INFORMATION

ACC 2007 Distinguished Service Awards

In the February issue of '*Cardiology*,' – the ACC (American College of Cardiology) presented its Distinguished Service Awards. They are:

Distinguished Scientist (Basic)

Jeffrey A. Towbin, MD, FACC, has been and continues to be one of the most significant figures in congenital heart disease, pediatric cardiology and heritable cardiovascular disease. His scientific work has been foundational on many different fronts, particularly with respect to myocarditis and dilated cardiomyopathy and the genetics of QT syndrome and Brugada syndrome. For example, he and his laboratory discovered the first genetic cause for dilated cardiomyopathy. Towbin has been a tenured professor of pediatric cardiology since 1998 and the chief of one of the largest pediatric congenital heart centers at the Baylor College of Medicine. He currently serves as a reviewer for 55 journals, is an editor for 15 journals and has written numerous articles and book chapters. He is known as a truly inspiring mentor, who works with, and inspires up-and-coming physician scientists from many institutions, not just his own.

Distinguished Fellow Award

Ralph G. Brindis, MD, MPH, FACC, who will receive the American College of Cardiology Distinguished Fellow Award at ACC.07 in New Orleans, has a long and distinguished record of service to the ACC. During the past dozen years, he has served in more than 40 official ACC capacities. However, he is probably best known for his success in creating and leading the ACC's National Cardiovascular Data Registry (NCDR™). Today, the NCDR™, which has expanded to four registries, is now one of the most successful clinical databases in the world with thousands of participating hospitals, and millions of patient records. It serves as tangible proof of the ACC's noble commitment to genuine quality improvement and is a lasting testament to Brindis's extraordinary vision, steady leadership and hard work. There are several secrets to Brindis' phenomenal success as an ACC leader. He is a gracious leader who is quick to acknowledge and encourage the participation of others. He is also particularly respectful of others' efforts. He possesses uncommon good judgment and an enormous capacity for hard work and has a wonderful sense of humor and positive attitude that is infectious. Given Brindis' long and distinguished career of ACC service, his singular record of success in forwarding the ACC's mission and his role as a mentor for future ACC leaders, he is truly a deserving recipient of the Distinguished Fellow Award.

Distinguished Scientist (Clinical)

The major impact made by Jane W. Newburger, MD, MPH, FACC, on clinical science and clinical trials in the Congenital Heart Disease field, began with her early study, Functional Outcomes of Cardiovascular Disease and Cognitive Function in Post-Operative Children, followed by her seminal work in the multicenter trials of Kawasaki disease therapy, one of the first large pediatric cardiology trials. Because of her leadership and research, she has improved the cardiovascular outcomes and cognitive function in a generation of children with heart disease. She also played a major role in the Pediatric Heart Disease Clinical Research Network and its governance and guidance, and has served on an National Heart, Lung and Blood Institute Advisory Council and task forces on pediatric cardiovascular disease. Over the years, her message has been about the value of rigorous, well-controlled studies. Newburger has served a tremendous role not only in changing and formulating clinical care in pediatric cardiology, but also in the mentoring of young clinician scientists.

Distinguished Service

Bernard J. Gersh, MB, ChB, DPhil, FCRP, FACC, is well-known in the cardiovascular community for his enormous and sustained clinical research contributions in the field of cardiovascular medicine that have had a major and direct impact on cardiologists and their patients. As a clinical investigator, he is one of the preeminent thought leaders in cardiovascular disease, and he has been at the cutting edge of clinical research in the fields of coronary artery disease, atrial fibrillation and heart failure. A prolific writer, he has authored or co-authored more than 450 manuscripts, 11 books and 98 book chapters. His investigator talents are only transcended by his ability to communicate his knowledge and ideas skillfully to a wide variety of audiences, including students and laypersons. Gersh has generously contributed his time to the cardiovascular community as a whole, especially the international community, and he is known for his caring skills as a mentor of younger physicians. He is one of the dominant figures in clinical

cardiology as an educator, clinical and investigator, and is clearly deserving of the ACC Distinguished Service Award.

Gifted Teacher

When Gabriel Gregoratos, MD, FACC, retired from the military medical corps as a colonel in 1976, he began his career as an outstanding, innovative and compassionate teacher in cardiology. He served as full-time faculty in cardiology at the University of California, San Diego; Pacific Medical Center, San Francisco and the University of California, Davis. In 1997, he joined the faculty of the University of California, San Francisco, as a professor of medicine and Director of the Cardiology Consult Service. Today he is Emeritus Professor of Medicine there. He has taught hundreds of students, residents, fellows and faculty, many of whom refer to him as one of the most talented and effective clinicians and teachers they ever encountered. Anecdotes shared by past fellows speak of fellows on other rotations leaving their work to join his cardiology consult rounds because he was such an outstanding communicator.

Gifted Teacher

Ami E. Iskandrian, MD, FACC, has dedicated his life to advancing the field of nuclear cardiology and incorporating its techniques into the tools available to clinical cardiologists. He has used his knowledge base of nuclear physics and cardiovascular imaging and his passion for clinical cardiology to stimulate and challenge the faculties and house staffs of the medical schools of the University of Alabama, University of Pennsylvania, and Medical College of Pennsylvania/Hahnemann University. With the title Distinguished Professor of Medicine, Iskandrian currently serves as professor of radiology and Director of the Nuclear Cardiology Division of the University of Alabama at Birmingham. His devoted personal interactions with medical students, residents and fellows have made him the most celebrated teacher in that institution's history in a brief period of only seven years, and he has been recognized with institutional teaching awards 15 times in his 30 years of teaching.

Master of the American College of Cardiology

Rolf M. Gunnar, MD, FACC, a 1949 graduate of Northwestern School of Medicine and currently Emeritus Professor of Medicine, Loyola University Stritch School of Medicine, has been one of this country's leading cardiologists for the past 50 years. He enjoys international recognition as a consummate clinician, teacher and investigator. He has fulfilled major leadership roles in the American College of Cardiology as a member of 27 years. He was recognized with the ACC Distinguished Service Award in 1997. His leadership activities extended to the American Heart Association and the American College of Physicians also. In addition to serving as Governor for Illinois within the ACC, he was a member of the Board of Trustees and chair of several committees, including the ACC/AHA Task Force on Early Management of Acute Myocardial Infarction published in 1990 and the first ACC/AHA guideline to address a disease entity.

Master of the American College of Cardiology

Robert Roberts, MD, FACC, who is president and chief executive officer of the University of Ottawa Heart Institute in Ottawa, Ontario, Canada, has led a career that personifies the M.A.C.C. award. The recognition of M.A.C.C. is given to individuals with an extensive track record of service to the ACC and to the cardiovascular profession and whose contributions have enhanced the ACC's mission and prestige. Distinguished in cardiovascular education and research, he has served on a number of prominent and influential ACC committees and on the Board of Trustees. Under his leadership of the Young Investigator Committee, awards were increased from one to three categories. As chair of the ACCF Research Fellowship Awards Committee from 2002 – 2006, Roberts successfully obtained support from other companies, enabling an increase in these awards also. Clearly, his many contributions to the ACC have enhanced its image and the development of future clinical scientists.

Master of the American College of Cardiology

Roberta G. Williams, MD., FACC, who is Vice President for Pediatrics and Academic Affairs at Children's Hospital in Los Angeles, and chair of the department of pediatrics at the University of Southern California, has a long record of service to the ACC and to the field of congenital heart disease. She has served on numerous committees for the ACC and on the Board of Trustees. In 2002 she received the ACC Gifted Teacher Award. Williams was co-chair of the Bethesda Conference #25 on Future Personnel Needs for Cardiovascular Healthcare, and also for the Bethesda Conference #32 on Adult Congenital Heart Disease. She recently served as chair of the National Heart, Lung and Blood Institute Working Group on Research in Adult Congenital Heart Disease, the recommendations of which were published in the Journal of the American College of Cardiology in 2006. Williams' record of service to the ACC is matched by similar accomplishments and service to the American Heart Association, the American Academy of Pediatrics and the American Society of Echocardiography.

For more information, see 'Cardiology' – February 2007 issue, pages 18 and 19, American College of Cardiology

THE 3RD ANNUAL TORONTO SYMPOSIUM

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THE LEFT HEART

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DEAR PARTICIPANT

We are delighted to welcome you to the 3rd Annual Toronto Symposium, *Contemporary Questions in Congenital Heart Disease*. After two extraordinarily successful meetings in 2005 and 2006, the topic of our 2007 meeting will be *The Left Heart*. Once again, we have invited a world-class faculty of scientists, physicians, surgeons, and allied professionals to participate with the Toronto team in a "state of the art" conference.

The Toronto Symposium aims to be a little different from the usual medical meeting. The title of each lecture, no matter whether addressing issues of basic science or clinical management, is framed as a topical question. Consequently we expect that the answers will be of direct relevance to your practice. This meeting will be suitable for anyone working in the field of congenital heart disease, but please note that we are limited to just 250 places, and have been sold-out prior to both previous meetings. So register early to avoid disappointment!

While there are some concurrent sessions, be assured there is no need for you to miss anything. Each of the lectures will be recorded, and each participant will receive a DVD shortly after the meeting. Again, this is a little out of the ordinary, showing both a video of the lecturer in real time, and the simultaneous PowerPoint presentation. An example of the format can be seen on our symposium website at www.sickkids.ca/cardiacsymposium. Copies of the DVD's from previous symposia can be purchased by e-mailing the Symposium organizer at cardiac.symposium@sickkids.ca.

We are looking forward to a focused, detailed, and rewarding meeting. Toronto's weather is glorious in early June, and the downtown location of our venue could not be better. We do hope you will be able to join us.

Sincerely, The Toronto Team

COURSE OBJECTIVES

To bring together experts in the field of left heart diseases in children and adults.
To explore the contemporary understanding of left heart development, physiology and pathophysiology in congenital and acquired heart disease.
To encourage a multidisciplinary approach to the fetal, preoperative, perioperative and late postoperative management left heart problems.

INVITED FACULTY

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SATELLITE MEETING: NEW DEVELOPMENTS IN FETAL CARDIOLOGY

JUNE 9, 2007 • SICKKIDS MAIN AUDITORIUM, 555 UNIVERSITY AVENUE

8:30 BREAKFAST AND REGISTRATION

NEW IMAGING TOOLS

9:00 Implementation of 3D/4D ultrasound during routine fetal cardiac screening *Dr. Roza Bataeva*

9:30 Application of 3D/4D ultrasound during advanced fetal echocardiography *Dr. Gerald Tulzer*

10:15 The power of power Doppler imaging *Dr. Shi-Joon Yoo*

10:35 Discussion

10:45 BREAK

11:00 Tissue Doppler imaging in the fetus *Dr. Edgar Jaeggi*

11:30 The use of fetal magnetocardiography in the diagnosis of fetal arrhythmias *Dr. Janette Strasburger*

12:00 Discussion

12:15 LUNCH

FETAL INTERVENTION AND OUTCOMES

1:30 Fetoscopic interventions: indications, imaging, techniques and results *Dr. Thomas Kohl*

2:30 Fetal cardiac interventions: The Boston experience *Dr. Audrey Marshall*

3:15 Advances in non-cardiac interventions *Dr. Greg Ryan*

4:00 Discussion

INVITED FACULTY

Dr. Roza Bataeva (Russia)
Dr. Thomas Kohl (Germany)
Dr. Audrey Marshall (USA)
Dr. Greg Ryan (Canada)
Dr. Janette Strasburger (USA)
Dr. Gerald Tulzer (Austria)

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Most Children in U.S. Hospitals Receive Medicine Off-Label

Nearly four out of five hospitalized children receive medications that have been tested and approved only for adults, according to a study of hundreds of thousands of patient records. This so-called "off-label" use of drugs was thought to be especially common in children, and the new research, the largest-ever U.S. pediatric study, confirms this.

"We measured the magnitude of off-label use of drugs in children," said study leader Samir S. Shah, MD, a pediatrician specializing in infectious diseases at The Children's Hospital of Philadelphia. "Given the nature of the available data, we could not evaluate safety and effectiveness of those medications, although those are important concerns. However, only a small number of drugs have been formally tested in children."

Once the U.S. Food and Drug Administration (FDA) approves a drug for any indicated use, physicians may legally prescribe the drug for different conditions and for patients in other age groups. This study measured off-label use only as defined by age, not by indicated conditions.

"With nearly 80% of children receiving off-label medications during hospitalizations, we need to focus our attention on the process by which medications are approved for pediatrics," said senior author Anthony D. Slonim, MD, DrPH., Executive Director of the Center for Clinical Effectiveness at Children's National Medical Center. "It is imperative that we thoroughly review this process to ensure that children are being treated with the safest, most effective therapies."

Researchers in the Pediatric Health Information Systems Research Group, representing various medical centers, analyzed patient records from 31 major U.S. children's hospitals for the entire year of 2004. At least one drug was used off-label in 79% of the more than 355,000 children requiring hospitalization. Off-label use accounted for $270 million, some 40% of the total dollars spent on children's medication according to the study, which appears in the March issue of the Archives of Pediatrics and Adolescent Medicine.

Off-label prescribing is relatively common among adult patients as well, but it has long been recognized that a large proportion of drugs used in pediatrics have never been tested in children. Over the past decade, federal regulations providing financial incentives to pharmaceutical companies have helped increase the number of drugs tested and approved for children. However, said Dr. Shah, "there was little information on the extent of off-label use among children, the types of drugs used off-label, and the characteristics of hospitalized children receiving those drugs."

All previous studies of off-label drug use in hospitalized children were performed outside the United States, often limited to specific conditions or to patients in single medical centers. This current study focused on 90 drugs that were either administered frequently to children or were recommended for further pediatric study by the FDA.

The drugs most likely to be used off-label in children were those approved for use on the central nervous system or autonomic nervous system, in addition to nutrients and gastrointestinal agents. For instance, 28% of the patients in the database received morphine, although the FDA has not approved it for use in children. Anti-cancer drugs were the least likely to be used off-label, possibly because such drugs are more likely to have been tested in pediatric cancer patients, that frequently participate in clinical trials.

Children were more likely to receive drugs off-label if they underwent surgery, were older than 28 days and had more severe illnesses. "Critically ill children may have failed to respond to conventional therapies and may receive drugs off-label because they have no approved options," said Dr. Shah.

The authors point out that, while physicians may sometimes have no alternatives to treating children with off-label medications, the practice is not risk-free. "Using drugs that have been insufficiently studied in children has contributed to adverse outcomes, which have been documented in the medical literature," said Dr. Shah. "We hope that by better defining the magnitude of off-label drug use, our study may help encourage greater cooperation among industry, academia and government in carrying out studies to better protect children."

In addition to his position at The Children's Hospital of Philadelphia, Dr. Shah is a Senior Scholar at the Center for Clinical Epidemiology and Biostatistics at the University of Pennsylvania School of Medicine. Dr. Shah and Dr. Slonim's co-authors, from several other universities and medical centers, were: Matthew Hall, PhD.; Denise M. Goodman, MD, MS; Pamela Feuer, MD; Vidya Sharma, MBBS, MPH; Crayton Fargason, Jr., MD; Daniel Hyman, MD, MMM; Kathy Jenkins, MD, MPH; Marjorie L. White, MD; Fiona H. Levy, MD; James E. Levin, MD, PhD; and David Bertoch, MHA.

The Children's Hospital of Philadelphia: For more information, visit www.chop.edu.

Children's National Medical Center: Children's National Medical Center. For more information, visit www.dcchildrens.com.

Fetal Heart-Cell Enzyme and Onset of Heart Failure

In almost all forms of heart failure, the heart begins to express genes that are normally only expressed in the fetal heart. Researchers have known for years that this fetal-gene reactivation happens, yet not what regulates it. Now, investigators at the University of Pennsylvania School of Medicine have discovered that an enzyme important in fetal heart-cell development regulates the enlargement of heart cells, known as cardiac hypertrophy, which is a precursor to many forms of congestive heart failure (CHF).

The study, which paves the way for new targets for treating cardiac hypertrophy and heart failure, appeared in a recent edition on the online publication of Nature Medicine.

"It's as if old programs are being reactivated in a sick heart," explains senior author Jonathan A. Epstein, MD, the W.W. Smith Endowed Chair for Cardiovascular Research at Penn. "In an adult heart, stresses such as high blood pressure induce the reexpression of a fetal gene program."

The investigators found that by inhibiting the enzyme HDAC in adult mice the fetal-gene program can be prevented from restarting. "We found that in various mouse models of cardiac hypertrophy and heart failure, treatment with chemical HDAC inhibitors or genetic deletion of HDAC2 prevented the beginning of the downward slide to progressive heart failure," says Epstein.

HDAC is an enzyme switch that regulates how DNA is packaged inside the cell, and therefore how large groups of related genes are turned on and off. During development HDAC normally regulates proliferation of heart cells in the embryo. "This makes sense if a molecular pathway in which HDAC has a major role is re-expressed--the adult heart instead makes the cells it already has bigger since it is unable to make more cells very easily."

The researchers also found that HDAC works in the heart in part by regulating expression of another enzyme called Inpp5f, which is involved in a pathway that controls the growth and multiplication of cells. Inpp5f is also related to tumor-suppressor genes involved in cancer.

"HDAC and Inpp5f give us new targets for regulating cardiac hypertrophy," says Epstein. "Inhibitors of HDAC may warrant testing for cardiac disease to stop the hypertrophy that accompanies the re-expression of the fetal-gene program." HDAC inhibitors are already in trials for cancer and one, valproic acid, has been used for years to treat seizures. Most CHF medications are aimed at regulating blood pressure, but very few are targeted at the heart-muscle cells themselves. About 5 million Americans are living with CHF today, according to the American Heart Association.

"To understand how to better treat heart disease at the cellular level is an important next step," says Epstein.

This study was funded by the National Institutes of Health. Co-authors in addition to Epstein are Chinmay M. Trivedi, Yang Luo, Zhan Yin, Maozhen Zhang, Wenting Zhu, Tao Wang, Thomas Floss, Martin Goettlicher, Patricia Ruiz Noppinger, Wolfgang Wurst, Victor A. Ferrari, Charles S. Abrams, and Peter J. Gruber.

Remote Device Allows Cardiologist to Monitor Patients Daily at their Homes

An easy-to-use in-home monitoring device for patients is changing the way doctors monitor the health of patients with implanted defibrillators. Rush University Medical Center is participating in a pilot study of the LATITUDE® Patient Management system to determine if the wireless home monitoring system can decrease hospitalizations for heart failure.

A mini-antenna built into the implanted defibrillator sends data to a wireless system placed in the patient's home. The data is automatically transmitted to a secure Internet server where the physician can access this medical information anytime, from anywhere.

Unlike other remote devices which only transmit data if certain parameters are out of range, the LATITUDE system uploads health information that can help physicians monitor the day-to-day changes in patients. In addition to the data stored before, during and after an arrhythmia, the system employs a wireless weight scale and blood pressure monitor to record vital statistics crucial for the management of cardiac failure patients. An abrupt change in weight could indicate worsening heart failure.

"This sophisticated system allows physicians to manage the patient much more closely. The same information that would normally require a visit to the office every few months can now be downloaded to the physician at anytime without the patient ever leaving home," said Dr. Kousik Krishnan, a cardiac electrophysiologist at Rush.

According to Krishnan, the LATITUDE system provides added peace of mind for the patient. The physician can remotely check if the defibrillator is working correctly and assess bat-

tery life. If the patient feels the defibrillator activate, he or she can transmit the rhythm information immediately. The physician can quickly analyze the data and determine if the shock was appropriate or if the patient needs to go to the hospital.

"Now with patient information available weekly, or even daily if needed, we can better monitor our patients," said Dr. Krishnan. "We can pick up abnormalities sooner and act on those before they become serious."

Rush is one of only 18 centers in the country participating in the LATITUDE Inductive Pilot Program which offers remote monitoring for all Boston Scientific/Guidant devices. In addition, Rush is one of the leading enrollers in the DECODE Trial to determine if the LATITUDE monitoring system is resulting in decreased hospitalizations. Heart failure has an annual direct cost of more than $26 billion in the U.S. and is the number one reason for hospitalizations.

The Beat Goes On! A Book for Young Adults Living with a Pacemaker or ICD

"*The Beat Goes On! A Book for Young Adults Living with a Pacemaker or ICD*" is a 40 page paperback book in an 8 1⁄2" X 10" size format. Nothing's better for dancing feet than a great beat — and hearts are no different! *"The Beat Goes On!"* is about living with the pacemaker or ICD that keeps that surgically-repaired heart in-step. This book is no two-step! *The Beat Goes On!* takes the young adult with a congenital heart defect step-by-step through:

1. the heart and how it works
2. abnormal hearth rhythms
3. types of devices and what they do
4. caring for a device.

The Beat Goes On! answers many everyday questions about having a device that may leave some patients off the beat. Your patients will groove to The Beat Goes On! The cost of the book is $2.95 each (plus shipping and handling).

The reviewers and contributors include: William A. Scott, MD; Teresa A. Lyle, RN, MN, CPNP; Nancy S. Winn, RN, BSN; and Wendy M. Book, MD. The book is published by Pritchett & Hull Associates, Inc. , 3440 Oackcliff Rd NE, Ste 110, Atlanta, GA 30340-3079. To order or more information call 800–241–4925 or visit the website at: www.p-h.com.

New Digital Grid will Link Heart Researchers Worldwide

Supported by an $8.5 million federal grant, leading researchers at three universities, including Johns Hopkins, are creating an ambitious digital network that will allow cardiovascular researchers worldwide to easily exchange data and expertise on heart-related illnesses. The project, called the Cardiovascular Research Grid, is expected to be a boon to the large community of heart researchers who will use these digital tools to find new ways to prevent, detect and treat life-threatening cardiac ailments. To launch this effort, the National Heart, Lung and Blood Institute, part of the National Institutes of Health, has approved an $8.5 million grant to be allocated over a four-year period that began March 1st. The digital project will be based at the Institute for Computational Medicine at Johns Hopkins, in collaboration with the Department of Biomedical Informatics at Ohio State University College of Medicine and the Center for Research in Biological Systems, University of California, San Diego. The project teams will develop open, grid-based software tools that will enable other research groups to become a "node" in the new grid. Once connected to the grid, researchers will be able to access and share experimental data, data analysis tools and computational models relating to heart function in healthy people and those with cardiac disease. To protect privacy, none of the heart data will carry information identifying patients from whom it was obtained. "There had never been a simple and direct way for cardiovascular researchers to share, analyze and model this important data," said Raimond Winslow, Director of the Institute for Computational Medicine at Johns Hopkins and principal investigator in the project. "Now, there will be." Winslow, who also is a professor in the Department of Biomedical Engineering, added, "This is the direction in which biomedical research is heading in the 21st Century. In the past, biomedical research was mainly done in individual labs. The Cardiovascular Research Grid will enable us to assemble large, geographically distributed research teams and bring together the leading experts in the world to focus on a common problem, regardless of their location. This grid will enable experimentalists to share their data with computational scientists, who will analyze and model the data.

The computational scientists will then share their results with their experimental colleagues who use it to refine their experiments. In this fashion, we believe the creation of the Cardiovascular Research Grid will accelerate the discovery of new approaches for treating heart disease." In deciding to fund the new grid, the National Heart, Lung and Blood Institute recognized the important contribution that bioinformatics can now make in developing a deeper understanding of the mechanisms of heart disease and in the development of new therapeutic approaches. During the first year of funding, the organizers of the new grid plan will deploy the initial infrastructure and software that will enable researchers to begin sharing and analyzing information. To accomplish this, Joel Saltz, chair of the Department of Biomedical Informatics and the Davis Endowed Chair of Cancer at Ohio State University, and his team will develop the software infrastructure that ties together resources on the grid. "The CardioVascular Research Grid will allow experts from different disciplines to combine their insights and to coordinate their efforts," Saltz said. "The ability to bring together many types of biomedical information will have a tremendous impact on the pace of progress in cardiovascular research" The Johns Hopkins team will focus on development of standardized vocabularies for describing biomedical data , models and data analysis applications. In addition to Winslow, the team will include faculty members Michael I. Miller and Tilak Ratnanather from the Department of Biomedical Engineering; and Donald Geman, Daniel Naiman and Laurent Younes, all from the Department of Applied Mathematics and Statistics. Mark Ellisman, Director of the National Center for Microscopy and Imaging at the University of California, San Diego, and his team will be responsible for developing effective and intuitive ways for users to interact with the Cardiovascular Research Grid. "Developing and deploying cyberinfrastructure to capitalize on emerging technologies to promote better collaboration and accelerate research is a core focus of our Center's efforts," said Ellisman, who also is director of UCSD's Center for Research in Biological Systems. "With a track record of developing scalable cyber-infrastructure to foster interdisciplinary investigations among teams of researchers in microscopy, neuroimaging and the environmental health sciences, CRBS is eager to collaborate with the John Hopkins team on developing the Cardiovascular Research Grid. We're looking forward to implementing an infrastructure that will effectively pool the diverse expertise, applications and instrumentation of the cardiovascular research community into a unified knowledge base—one that will enable researchers to tackle cardiac disease studies of greater scope and complexity." The Cardiovascular Research Grid will be headquartered in the 79,000 sq. ft. Computational Science and Engineering Building, now under construction on the Homewood campus of Johns Hopkins. The building is expected to open this summer.

Related Links: Institute for Computational Medicine at Johns Hopkins: www.icm.jhu.edu/ Johns Hopkins Department of Biomedical Engineering: www.bme.jhu.edu National Heart, Lung and Blood Institute: www.nhlbi.nih.gov.

April Conference Correction:

On page 11 of the April issue under the June Symposium Focus sidebar the, *"Second International Symposium on Heart Disease (ISHAC)"* should have been listed as the, "*International Symposium on the Hybrid Approach to Congenital Heart Disease (ISHAC)."*

For more information go to www.hybridsymposium.com

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