Embolization for Uterine Fibroids

by Jafar Golzarian, MD, Professor (Clinical), Department of Radiology

Uterine fibroids (myomas, leiomyomas, or fibromyomas) originate from muscular cells of the uterine wall and grow within the uterus. They are the most frequent tumors of the female genital tract: 25% of women of childbearing age have a fibroid. The rate increases with age and decreases after menopause. African-American women are at a higher risk for fibroids—as many as 50% have fibroids of a significant size.

The majority of fibroids do not cause symptoms and thus are not treated. Depending on location, size and number of fibroids, they may cause:

- Heavy, prolonged menometrorrhagia. This might lead to anemia.
- Pelvic, back or leg pain
- Pelvic pressure or heaviness
- Dyspareunia
- Bladder pressure leading to a constant urge to urinate
- Pressure on the bowel, leading to constipation and bloating

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Believe it or not, preparations for another RSNA meeting are starting again. For those of us in academic radiology, it is much more than what it appears to be on the surface.

I have had something of a love-hate relationship with the RSNA annual meeting. On the negative side, there is a great deal of stress and preparation, attending the meeting (and more to the point, all the meetings that take place at the annual event) and following up after the meeting on ideas/contacts that the meeting generates. The meeting demands the input of huge resources on the part of our and other academic departments - personal hours, as well as funding for travel, hotels, meals and the audiovisual demands of presentations and exhibits. In essence, the approximately 10% of radiologists who are academicians are footing the bill for radiology’s - indeed medicine’s - largest continuing medical education extravaganza without financial recompense. The other 90% of radiologists benefit but contribute little or no resources to the effort.

There are, however, a number of positive attributes to the RSNA meeting to consider. Many, if not most, academic radiologists who have gained recognition as outstanding among their peers, will credit the RSNA for having at some time provided them the exposure they needed to propel forward their careers. The meeting has been a showcase for our faculty. In recent times we have had nearly all of our faculty and trainees attend the meeting and have had a significant proportion invited to present scientific papers about their research. Many others are invited to give refresher courses.

Another important benefit of the meeting is that it gives opportunities to introduce our residents to the excitement of academic radiology. Every year we send all of our residents to the meeting and a number present papers and exhibits. Here they gain a new perspective about radiology, its comradery and scope, and the people who make it the specialty that it is. In addition, we invariably send a second-year resident to participate in the RSNA-AUR-ARRS Introduction to Research Program, which has been directed by one or more of our faculty for the last eight years and has included many of our faculty as lecturers. The program provides a 13-16 hour primer on research for 80 second year residents from around the country at the RSNA and ARRS meetings. Over the last five years, an international component of the program has added additional trainees.

Aside from what is obviously apparent, however, is that the RSNA meeting is set against a background of hundreds of other meetings. I would be surprised if there is an organization or publication in radiology that does not hold some of its planning, strategic, financial or other meetings at RSNA. Many of us who are involved in the organization of Radiology rue that this is the case, since it often makes attending much of the scientific program impossible. At the same time, having a place where all of these efforts can occur at once allows for efficiency well beyond what would be possible if there were no such thing as the RSNA annual meeting. I cannot imagine how many phone calls and short trips, and how much expense, are obviated by my attendance at RSNA.

Lastly, I believe that the RSNA meeting has, without really trying, provided an opportunity for our specialty to migrate to a higher level of diversity of participation and contribution than has been the case in the past. I believe this is the case particularly with regards to the inclusion of women and young radiologists. The RSNA meeting, like most meetings, provides a venue where merit can be recognized. However, as it is by far our largest meeting, the RSNA provides this forum on a grand scale and creates opportunities for interaction between those who have talent but lack recognition, and those who can help them advance. Through the scientific program, the aforementioned innumerable organizational meetings and social occasions are legend.

So, I view attending the RSNA meeting from a cost and benefit perspective. It costs a lot, but there is a lot to be gained. Besides, given the importance of the organization to the specialty and all that goes on at the meeting, there’s really not much choice. And, what better way to spend the week after the Thanksgiving holidays?
Sectional Update
Interventional Radiology

by Shiliang Sun, M.D., Associate Professor (Clinical), Director of Interventional Radiology

The Interventional Radiology Section has been changing. There have been some significant shifts in endovascular therapy due to so-called “turf-battles” happening nation-wide in the past few years. However, this shift has stabilized and our section continues to survive, make progress and succeed by developing and utilizing new techniques, providing full-spectrum of patient care (including outpatient clinic, inpatient care and post procedure follow-up) and collaborating with other departments in the hospital, etc.

In the south angiographic suite, a new Siemens Multistar was installed. The introduction of this state-of-the-art equipment provides us with an excellent platform for performing complicated procedures. With two full functioning angiographic suites, we have been able to efficiently manage the growth of workload and improve the quality of our service.

In the past year many new procedures have been pioneered at UIHC and have become a part of our routine clinical practice. Dr. Golzarian has successfully performed sub-intimal recanalization for patients with long segment complete occlusion of the superficial femoral artery. This is a new area of percutaneous endovascular therapy for long segment occlusion of peripheral vasculature and demands a great deal of experience and technical skill. As a world-renowned expert in the field, Dr. Golzarian also performed a trans-arterial embolization for treatment of type II endoleak that is secondary to endovascular repair of abdominal aortic aneurysm. Collaborating with the Section of Nuclear Medicine and the Clinical Cancer Center, internal radiation therapies by trans-hepatic artery delivery of spheres containing Yttrium-90 have been safely conducted in several patients at UIHC for treatment of colorectal metastases to the liver. We also successfully performed trans-hepatic right portal venous embolization for facilitating surgical resection of large portions of liver tissue.

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Sectional Update
Pediatric Radiology Division

by Yutaka Sato, M.D., Professor of Radiology

The following are things that are happening in the Pediatric Radiology section. Dr. Geetika Khanna, former Fellow of the Department of Radiology at UIHC, joined the faculty as Assistant Professor on the tenure track. Recently she was awarded the K30 Clinical Research Curriculum Award from the National Institutes of Health (NIH). She is also the local PI for the American College of Radiology Imaging Network’s (ACRIN) “Whole Body MRI in the Evaluation of Pediatric Malignancies” trial at The University of Iowa. Dr. Khanna was also selected as a Fellow of the ACRIN Clinical Trials of Imaging and spent time as a didactic component of the Fellowship at ACRIN Headquarters in Philadelphia (September, 2004), in the NIH Biomedical Imaging Program in Bethesda (October, 2004) and in the ACRIN Biostatistical and Data Management Center at Brown University in Providence (November, 2004). We hail her for her success in her academic career.

Dr. Michael P. D’Alessandro was recently promoted to Professor. In addition to his work on the Virtual Naval Hospital and Virtual Hospital, he is also a primary participant in a recently awarded NIH grant entitled “Planning Grants for Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases Research.”

Drs. Yutaka Sato and Simon C.S. Kao continue to be the workhorses in the clinic. Both were nominated Medical
Fibroids are usually diagnosed during a gynecologic examination. The presence of fibroids is most often confirmed by a pelvic ultrasound. Fibroids can also be confirmed using MRI. These imaging techniques serve as a baseline examination for follow-up after uterine fibroid embolization (UFE).

UFE is performed under sedation and local anesthesia. The interventional radiologist inserts a catheter via the femoral artery. The uterine arteries are identified using angiography with contrast media injection. The catheter is then positioned in the uterine artery. Both uterine arteries need to be embolized. The interventionist slowly releases tiny particles of polyvinyl alcohol or tris-acryl microspheres with fluoroscopic guidance. The particles flow to the fibroids first and wedge into the vessels. This blocks the blood flow to the tumor(s), but blood flow to the normal uterine tissues is maintained via the normal myometrial branches (Fig.1).

Most patients feel cramping after embolization. Using only embolization of the fibroid vessels instead of blocking the main uterine arteries can sometimes reduce the severity and duration of the pain. We have demonstrated that the pain medication intake and the severity and duration of pain decreased significantly with this technique. Most centers keep patients overnight to control the pain.

Embolization results in fibroid infarction and subsequent degeneration. The symptoms resolve in 85% to 95% of patients. The fibroid and uterus volume decreases progressively with time from 45% to 75% after one year (Fig.2).

A very small proportion of patients experience amenorrhea on a temporary basis. Permanent amenorrhea seldom occurs in patients younger than 40 years. The infection rate after embolization is very low and can be treated by antibiotics most of the time. Less than 1% of patients need myomectomy or hysterectomy to complete the removal of a persisting fibroid. Expulsion of fibroids is another complication that can appear several months after embolization. In this case, sometimes the necrotic fibroid is delivered spontaneously or needs to be removed by hysteroscopy. Finally, the mortality rate related to this technique is very low (1/10000).

This technique is considered a safe alternative to hysterectomy and myomectomy. It can be offered to patients with symptomatic fibroids who do not desire pregnancy. In patients with a desire for pregnancy, UFE can be considered only if no other alternative is available.

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**EMBOLIZATION, continued from page 1**

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**PEDIATRIC, continued from page 3**

Student Outstanding Faculty Teacher of the Year for 2002-03. Dr. Sato was selected to be an ACR Fellow in 2003, and Dr. Kao received the same honor in 2004. Dr. Kao has also co-edited a book entitled, “Imaging Children, 2nd ed.,” published in December of 2004 by Churchill Livingstone.

Dr. Edmund A. Franken, relieved of his Interim Department Head responsibilities in 2002, entered phased retirement and is now assisting in Mammography.

Dr. Tae IL Han joined the Department of Radiology as Visiting Assistant Professor from Korea. He will be working in the Pediatric section throughout the 2004-5 year.

In addition to our regular faculty, we were also joined this year by two visiting researchers: Shoko Ohashi, MD, from Japan, and Nareeman Alnsour, MD, from Jordan.
INTERVENTIONAL, continued from page 3

with metastatic lesions. Combined with Yttrium sphere embolization, radio-frequency ablation, chemoembolization, and preoperative embolization, we have developed full spectrum coverage for the treatment of late-stage liver and kidney tumors. Furthermore, Interventional Radiology is increasingly recognized as a unique clinical service to manage massive and life-threatening hemorrhage. Our venous interventions also continue to thrive. The area of coverage includes the full spectrum of venous interventions. Our outpatient clinic continues to work well. With Dr. Golzarian as the leader of the section, the multi-discipline fibroid clinic has gained significant success with more patients recruited and treated by uterine artery embolization.

The section continues to be involved in several funded research projects. Dr. Golzarian has been involved in two NIH funded projects titled “Image and Model Analysis of Lung Disease” and “Bolus chasing angiography with adaptive real-time CT.” He takes 5% and 30% of efforts on the grant. A new book titled “Embolotherapy: A Comprehensive Approach” is in progress with J. Golzarian, S. Sun, and M. Sharafuddin as the editors. In the last year the section had 9 scientific papers presented in national (Society of Interventional Radiology) and international meetings (Cardiovascular Interventional Radiology Society of Europe). One poster won an honorary award.

We will have a new faculty member from Japan. Dr. Hidefumi Mimura will join The University of Iowa Radiology Department in the near future. His primary interests are in interventional radiology with special concentration on liver tumor chemoembolotherapy and percutaneous trans-hepatic artery infusaport placement.

Research

Hyperpolarized 3-He Gas MRI of the Lung to Be Established at UI

by Eric A. Hoffman, P.h.D., Professor of Radiology, Physiology and Biomedical Engineering

Edwin J.R. van Beek, M.D., Professor of Radiology

GE Healthcare (formerly Amersham) has agreed to provide a helium gas (3-He) hyperpolarizer to the Radiology Department’s lung imaging group. This machine provides a new method of lung imaging wherein hyperpolarized 3-He gas is inhaled and the MR scanner is re-tuned to sense the helium signal. Hyperpolarized gas imaging allows for the direct imaging of regional lung ventilation and perfusion. It provides a direct measure of the ventilation/perfusion ratio, as well as a regional index of peripheral airspace size known as the “apparent diffusion coefficient” or ADC. There has been great interest on the part of the newly formed Iowa-Comprehensive Lung Imaging Center (I-Clic), directed by Dr. Eric Hoffman (see July 2004 issue of the Radiology Update newsletter), to utilize their advanced CT methods to assess the quantitative nature of the new 3-He imaging system, and to use MRI to complement (or in some cases replace) CT imaging of the lung. Because of the non-ionizing nature of MRI, this new MR-based lung imaging method is of special interest to longitudinal studies where radiation dose limits the number of study time points that can be carried out by CT.

The University of Iowa joins a select group of centers with this 3-He imaging capability, including three groups in Europe and four other groups in the USA. As there is no plan to build other polarizers in the near future, these eight sites will comprise the total number of sites in what has been dubbed “Imanet” by GE Healthcare. Imanet will serve commercial enterprises, largely the pharmaceutical indus-

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tries, who wish to utilize this technology as outcomes measures for multi-center trials. In addition to participating in Imanet trials, The University of Iowa investigators will be free to use the imaging methods in their investigator initiated research programs. Additional equipment needed on the MR scanners that allow for tuning of the scanner to image the 3-He is being provided to the lung imaging of research group at no cost by Siemens, manufacturer of the Radiology Department’s MR scanners, as well as the I-Clic research CT scanner.

One of the early pioneers of the use of 3-He MR imaging in a wide variety of lung diseases is Dr. Edwin van Beek, a chest radiologist from Sheffield, England, who recently joined UI Radiology. His work has shown this method to be a particularly effective tool in imaging pediatric lung diseases (such as cystic fibrosis or asthma that is difficult to control) and for evaluating smoking-related lung diseases. Dr. van Beek will split his time between the clinical chest section and lung imaging research, working with the members of I-Clic. He is already integrated into several NIH funded research projects in collaboration with Dr. Eric Hoffman (Radiology) and Dr. Geoffrey McLennan (Pulmonary Medicine).

### 2004 RADIOLOGY TEACHING AWARDS

**DEPARTMENTAL TEACHING AWARDS**

**Resident Research Award**
Matthew Berst, MD

**Resident Teacher of the Year**
Jody Bolton Smith, MD

**Special Award for Outstanding Clinical Service**
Thomas Barloon, MD

**Krabbenhoft Award for Excellence in Teaching**
Bruce Brown, MD

**MEDICAL STUDENT TEACHING AWARDS**

**Faculty Teacher of the Year**
George El-Khoury, MD

**Outstanding Faculty Teachers**
Lee Bennett, MD
Joan Maley, MD

**Resident Teacher of the Year**
Derik Weldon, MD

**Outstanding Resident Teachers**
Gerald Decker, MD
Adnan Qalbani, MD
**Honors & Awards**

**D. Lee Bennett, MD**
- Elected Councilor to the American College of Radiology, October 2004.

**Laurie L. Fajardo, MD**

**Geetika Khanna, MD**
- Selected as a 2004 Fellow of the American College of Radiology Imaging Network (ACRIN).

**Mark T. Madsen, PhD**

**Toshio Moritani, MD, PhD**

**Brian F. Mullan, MD**
- Received “Editor’s Recognition Award for Reviewing with Distinction” from the Editor of Radiology.

**Axel Ruprecht, DDS**
- Selected to be on the Editorial Board of the Korean Journal of Dental Research in 2004.
- Served as an Examiner in Oral and Maxillofacial Radiology of the Royal College of Dentists of Canada (equivalent of being a Board Examiner in the USA).

**Wendy R.K. Smoker, MD**
- First Place Award from the American Society of Head and Neck Radiology Annual Meeting, Philadelphia, PA, September 2004, for the Scientific Exhibit entitled, “Vascular lesions of the orbit – more than meets the eye.” Yee NK, Smoker WRK, Gentry LR, Reede DL.
- Passed the American Board of Radiology recertification exam with special qualifications (CAQ) in Interventional Radiology on July 16, 2004.
- Elected to become a member of the Society of Vascular Surgery.
- Appointed to the Scientific Physician Advisory Board for Boston Scientific and Bacchus Vascular.
- Invited to be a journal reviewer for Radiology and American Journal of Roentgenology.
- Appointed to be a Fellow of the American Heart Association’s CV Council.

**William Stanford, MD**
- Served as co-editor in a special issue of the International Journal of Cardiovascular Imaging on Cardiovascular CT Imaging.

**Korea**
- Recipient of the “Minnies” 2004 award for Best Radiologic Technologist Training Program.

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**Neuroradiology Section Makes Strong Showing at the American Society of Neuroradiology (ASNR) Annual Meeting, Seattle, WA, June 5-11, 2004**

**Magna Cum Laude Award** for the Scientific Exhibit, “It’s not always salt and pepper: A review of typical and atypical paragangliomas and their mimics.” Goh JPN, Smoker WRK, Gentry LR, Reede DL.

**Summa Cum Laude Award** for the Scientific Exhibit, “Comprehensive diagnostic evaluation of cervical spine trauma.” Gentry LR, Hartman MJ, Pulfer KA, Smoker WRK, Reede DL.


**Cum Laude Award** for the Scientific Exhibit, “Doctor! What is this thing in my nose? Imaging characteristics of nasal masses.” Godelman A, Reede DL, Smoker WRK, Gentry LR.

**Cum Laude Award** for the Scientific Exhibit “Vascular Lesions of the Orbit – more than meets the eye.” Yee NK, Smoker WRK, Gentry LR, Reede DL.
Welcome New Faculty!

JOONG MO AHN, MD, PhD, joined the Department of Radiology as an Associate Professor in the Musculoskeletal section. Dr. Ahn received his MD/PhD from Seoul National University College of Medicine in Seoul, South Korea where he completed his residency in Radiology as well. Prior to his appointment at UIHC, he was an Assistant Professor of Radiology at the Eulji University School of Medicine in Taejon, Korea.

BAYANI V. EVANGELISTA, MD, joined the Department of Radiology as Assistant Professor (Clinical) in the Body Imaging section. He received his medical degree at Far Eastern University in Manila, Philippines, and completed his diagnostic radiology residency training at Cooper University Medical Center, Camden, NJ. Dr. Evangelista recently completed a fellowship in Body Imaging at The University of Iowa, Iowa City, IA.

GEETIKA KHANNA, MD, joined the Pediatric Radiology section as Assistant Professor. She received her MD at All India Institute of Medical Sciences, New Delhi, India. Dr. Khanna completed her radiology residency at St. Louis University in St. Louis, MO, and The University of Iowa, Iowa City, IA. Prior to her faculty appointment, Dr. Khanna was a Pediatric Radiology fellow at The University of Iowa.

HO KYU LEE, MD, PhD, Visiting Associate, received his MD/PhD and completed a residency from Seoul National University, Seoul, South Korea. Dr. Lee did his fellowship in the Section of Neuroradiology at Asan Medical Center, University of Ulsan, Seoul, Korea. Prior to his appointment at UIHC, he was Professor of Radiology in the Department of Radiology at Asan Medical Center, University of Ulsan. Dr. Lee joins the Neuroradiology section.

KAORU SASAKA, MD, PhD, joined the Musculoskeletal section as Visiting Assistant Professor. She completed her medical training and residency at the University of Tokushima School of Medicine, Tokushima, Japan, and received her PhD at St. Marianna University School of Medicine, Kawasaki, Japan. Before coming to UIHC, Dr. Sasaka was an Associate Professor of Radiology at St. Marianna University.

EDWIN J.R. VAN BEEK, MD, PhD, Professor, received his medical degree at Erasmus University Medical School, Rotterdam, the Netherlands. His doctorate and diagnostic radiology residency training were completed at Academic Medical Center, University of Amsterdam, NL. Before joining the Chest section at UIHC, Dr. van Beek was Senior Clinical Lecturer/Honorary Consultant in Radiology, as well as Reader in Radiology.
New First-Year Diagnostic Radiology Residents

Dean G. Anderson, MD, University of Utah  
Stephen J. Burke, MD, University of Iowa  
Mohammad A. Dogar, MD, King Edward Medical College-Pakistan  
Jeffrey R. Flermoen, MD, University of Michigan  
Roopa M. Goswami, MD, University of Iowa  
Joshua J. Lucas, MD, University of Iowa  
Lee T. Marshall, MD, University of Iowa  
Rakesh B. Patel, MD, University of Illinois  
Walter H. Kim, MD, Loma Linda University  
Jaideep S. Sohi, MD, Saba University, Netherlands, Antilles  
Jason L. Willis, MD, Universidad Iberoamericana, Dominican Republic

Publications

Books/Book Chapters


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PUBLICATIONS, continued from previous page

ARTICLES


• Read CH Jr, Tansey MJ, Menda Y. A 36-year retrospective analysis of the efficacy and safety of radioactive iodine in treating young Graves’ patients. *Journal of Clinical Endocrinology & Metabolism*. 89(9):4229-33, 2004 Sep.


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PUBLICATIONS, continued from previous page


ABSTRACTS


Scientific Presentations


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SCIENTIFIC PRESENTATIONS, continued from previous page


Invited Speakers


Invited / Refresher Course Faculty


Scientific / Educational Exhibits


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Mark Your Calendars!

For more information, please contact Nichole Jenkins at (319) 353-8690. We hope to see you there!

EXHIBITS, continued from previous page


Grants


On Saturday, April 30, 2005, The University of Iowa Department of Radiology will host an alumni reunion in conjunction with its 3rd Annual Radiology Postgraduate Seminar & Resident Research Program:

Morning: Meeting for 1990-2000 UI Radiology alumni
Afternoon: Senior resident scientific presentations
Evening: Lecture by J.G. Fletcher, M.D., Faculty of Radiology at Mayo Clinic.
Banquet for all participants