



# Uterine Fibroid Embolization

## Technology and technique... together at last

### Who/where

Paoli Hospital, Philadelphia, PA, USA

Dr. Atul Gupta,  
Director of Interventional Radiology

### Challenge

Improve access to the tortuous and complex uterine artery during uterine fibroid embolization (UFE)

### Solution

Allura Xper FD20 using 2k imaging and advanced integrated 3D Roadmap and XperCT

The benefits to patients of 'non-surgical' uterine fibroid embolization (UFE) are well known - reduced risk, cost, and recovery time. But even a great procedure can be improved upon.

Thanks to technology advances, interventionalists can now see more and do more, and in record time.

"The UFE I'm doing today barely resembles the procedure I was doing before," says Dr. Atul Gupta of Paoli Hospital in suburban Philadelphia.

Major image quality improvements and real-time 3D imaging have changed the way Dr. Gupta works. Procedures can move

faster, on a predictable schedule, require less radiation, and can be confirmed as successful before his patient leaves the table.

"With conventional Image Intensifiers (I.I.'s), there was a lot I wasn't seeing. And, I could never predict how long it might take me to reach the uterine artery, or to be totally confident I was treating all the fibroids once I got there," Dr. Gupta recalls.

### A flagship interventional system

Dr. Gupta came to Paoli Hospital determined to build an interventional radiology suite that would rival that of the most sophisticated university hospital.

Dr. Atul Gupta, Director of Interventional Radiology



The Allura Xper FD20 high-end digital flat detector angiography system was his choice for its image quality and the integrated technology base that would extend its useful life. Top-notch technology, he knew, would differentiate his department from others in the area.

“Now, I’m absolutely confident that my particle is right where I want it.”

#### Image quality a world apart

“For me, 2K (2048 X 2048) resolution was an even greater quantum leap than conventional I.I.’s to flat detectors. Not only am I seeing vessels and structures I’ve never seen before, I’m seeing the actual 500 - 700 micron

embolic particles lined up within the uterine artery. Before, I could only see lack of blood flow. Now, I’m absolutely confident that my particle is right where I want it.”

Advanced 3D features turned the tide. Image quality, while spectacular, is not all Dr. Gupta credits for changing how he works so dramatically. Advanced 3D imaging he believes, was pivotal - specifically 3D rotational angiography (3D-RA) and XperCT, a new soft-tissue, CT-like imaging technique.

“3D imaging always had the potential to simplify our work, but now it takes no time at all.”

Now he sees exactly what he needs to see, exactly how and when he needs to see it. That’s given him greater control than he’d ever thought possible.

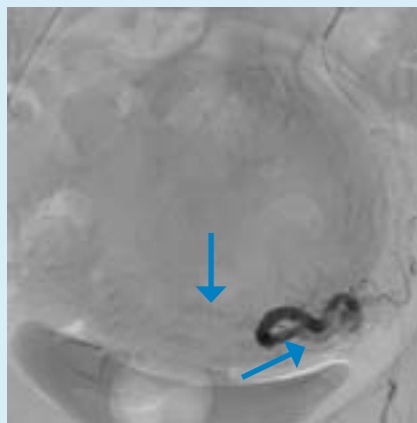
“3D imaging always had the potential to simplify our work, but until now it hasn’t been nearly as practical as we’ve needed it to be. People have it, but don’t use it,” Dr. Gupta says. “Why? The problem is reconstruction time. If 3D delays everything to the point of disrupting the procedure, what good is it? That’s all changed. Now it takes no time at all.”

#### 3D Roadmap for rapid access

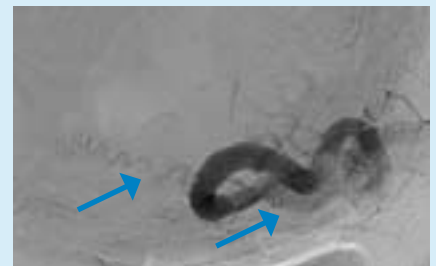
The anatomy that must be traversed to gain access to the uterine artery is exceptionally tortuous and complex. While it doesn’t happen every time, 20, 30, 40 minutes – even an hour might be spent just reaching the



Arteriogram, prior to embolization



Post embolization arteriogram showing embolic particles lined up within the uterine artery



Additional magnification allows clear visualization of 500-700 micron embolic particles

destination. It's laborious injecting contrast and making decisions at each of the numerous junctures along the way.

"We spend our days working in a 3D world of tortuous, crisscrossing and branching blood vessels, and we have traditionally only had the ability of using tools such as roadmapping in 2D."

"I'll see the exact angle I need to get where I need to be and just follow the line."

"Now at the start of each procedure I perform a 4 second 3D-RA run. The reconstruction is almost immediate and I see the origin of the uterine artery. I then use the extremely powerful Philips 3D Roadmap feature to visualize the pelvic arteries in three-dimensions, while superimposing live fluoro. I can adjust angles while negotiating my catheter, *in real time*. I see the exact angle I need to get to where I need to be, and just follow the line. It feels like I am cheating."

#### XperCT: the proof statement

Dr. Gupta's lab is configured with three monitors: two dedicated to the procedure, the other displaying ultrasound and MRI images. He sees at a glance the precise location of smaller fibroids he might otherwise miss. XperCT closes the loop.

With XperCT, Dr. Gupta creates CT-like images in the interventional suite – with the angio system. Following embolization, he observes the microspheres within the artery, and smiles. Then, he checks the XperCT image for unenhanced fibroids.

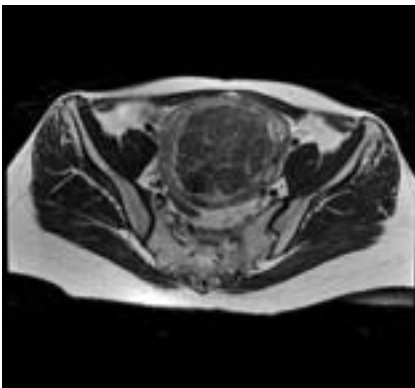
"Now I know unquestionably if my treatment's complete and if it's a success."



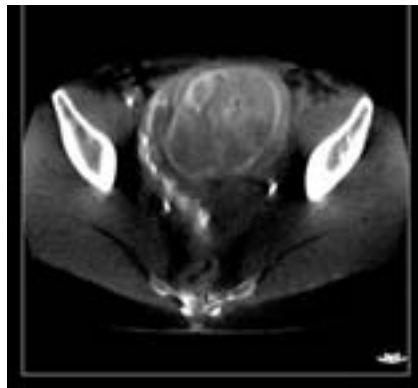
"Now I know unquestionably if my treatment's complete and if it's a success. If I need to search for another artery, I do so. If it's the ovarian artery, I embolize it – right then and there, eliminating the need for the patient to return for a second treatment".

#### And UFE is just the start

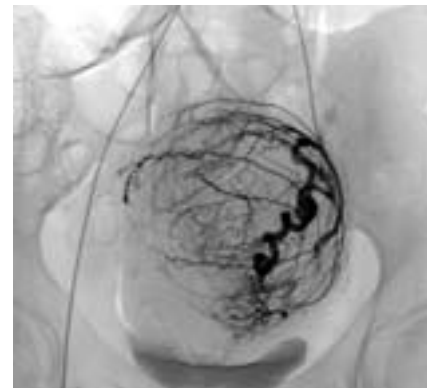
Dr. Gupta gives many demonstrations of this startling new technology. What does he enjoy most? Seeing a fellow interventionalist's eyes light up and hearing the words, "Now, wouldn't this come in handy when I'm ..."



MRI of fibroid, pre-treatment



XperCT post embolization, showing enhancement of the fibroid indicating successful embolization



Angiography left uterine artery demonstrating a large fibroid

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Philips Healthcare  
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