Making Vascular and Endovascular Surgery Affordable in India: An Interview With Ramesh K. Tripathi, MD

Interview by Jennifer Ford

Ramesh Tripathi, MD, FRCS, FRACS, is professor of vascular and endovascular surgery and clinical director of Narayana Institute of Vascular Sciences in Narayana Hrudayalaya Health City, Bangalore, India. He is a distinguished fellow of the Society of Vascular Surgery in the United States. He has contributed extensively in the areas of treatment of thoracic and abdominal aortic aneurysms with innovative experimental work on in situ fenestration of thoracic stent-grafts and deep venous valve reconstruction and stents. He is credited for performing India’s first successful endovascular repair of an abdominal aortic aneurysm in 1997, followed in 1998 by India’s first thoracic aortic aneurysm repair, and he performed the first Implant of the Medtronic Xcelerant AAA stent graft in Australia and New Zealand in 2005. Vascular Disease Management interviewed Dr. Tripathi about the history and development of Narayana Institute of Vascular Sciences. Dr. Tripathi reports no disclosures related to this article.

Q: Please describe your clinic.

A: Narayana Institute of Vascular Sciences, part of Narayana Healthcare Inc. (NH), is one of India’s largest healthcare service providers. It is an industry model for its ability to reconcile quality, affordability, scale, transparency, credibility, and sustainable profitability. Equipped with state-of-the-art specialty and tertiary care facilities, it is now a one-stop destination for cardiovascular therapies. Patients from all walks of life and from all corners of the world come here for healthcare. No one is refused treatment due to lack of funds. The hospital has 2,600 beds onsite in Bangalore with over 120 procedures (55 heart and vascular surgeries and 70 cardiovascular catheter interventions) performed every day and 80,000 outpatients seen per month. In recognition of its cost-cutting approaches, NH was ranked 36th by Fast Company among the world’s 50 most innovative companies in 2012.

Q: How did the clinic get started?

A: I was practicing in Wellington, New Zealand, as a senior consultant and honorary professor in vascular surgery and vascular interventional radiology, when during a visit to India, I met with Dr. Devi Prasad Shetty. He is the chairman of the world
famous Narayana Hrudayalaya Hospital, which specializes in cardiac care in India (“narayana hrudayalaya” means “God’s compassionate home” in Sanskrit). He runs the largest pediatric cardiac surgery facility in the world, studied by Harvard Business School for its business and health models providing cardiac surgery to poorer patients. This is achieved by creating affordable “micro-health insurance” for economically weak sectors of society and adopting a “Walmart” business model aimed at driving down costs by performing high volumes of surgeries and interventions. I was proud and impressed by the fact that such a thing was possible in India.

Dr. Shetty wanted to set up a world-class vascular institute in India that could stand shoulder to shoulder with the top vascular departments in Europe and North America. I am humbled that he chose me to accomplish what was no small task. The challenges were enormous.

First, transitioning peripheral interventions from cardiologists and aortic surgery from cardiac surgeons had never succeeded in India. Second, the infrastructure and resources to do high-end vascular and endovascular procedures were nonexistent. Third, funds were limited.

I turned to Dr. Shetty for assistance. He gave me an unprecedented platform from which to start. He assured a change in the internal aneurysm referral pattern from cardiac surgery to vascular surgery and at the same time opened up time slots in the cardiac cath lab. This was a great starting point and I joined Narayana Hrudayalaya in January 2011.

I leveraged my expertise as a vascular surgeon to attract new patients to the vascular institute, and I began to perform complex vascular surgeries in the operating room (OR) with cardiac surgery instruments and endovascular interventions in the cardiac cath labs. It was a testing period of 3 months, as I had virtually put my hands in the lion’s mouth, with just a staff of two surgeons!

As the number of procedures grew, so did our reputation, and we secured an approval for a 2-year fellowship in vascular surgery from Rajiv Gandhi University of Health Sciences, as well as a 3-year residency in peripheral vascular surgery from the National Board of Exams (NBE), within a record 1 year’s time. With 5 fellows on board, we increased our throughput to 180 cases a month (110 open surgeries and 70 endovascular cases a month).

As a consultant to Philips, I was able to successfully negotiate an Allura Xper 20/20 FD hybrid OR with Xper-CT for our hospital on a pay-per-use business model. It was an exciting time as I learned about and implemented the first fully integrated hybrid OR in India. We added a noninvasive imaging lab with duplex ultrasound and a MultiLab II (Medev Medical Devices), and initiated the SAVE India (Stroke, Aortic aneurysm and peripheral Vascular Evaluation), the first vascular screening program in India. In addition we introduced diabetic foot testing, with an extensive range of tests like pressure pedography, foot scans, and transcutaneous oxygen pressure. We have an on-site computer-aided designing and computer-aided manufacturing to provide appropriate footwear for diabetic feet.

Q: What kinds of procedures have you focused on?

A: Because my unit is a referral center for complex vascular pathology from the Indian subcontinent, Africa, and the Middle East, my colleagues and I deal with a wide variety of vascular disease processes. In addition
to the standard procedures such as abdominal and thoracic aortic aneurysm repairs, carotid endarterectomy, lower limb bypasses, endovenous varicose vein ablation, and arteriovenous dialysis access, we perform a variety of advanced open procedures. These include, open thoracoabdominal aneurysm repairs, visceral reconstructions including renal (bench surgery for aneurysm with autotransplantation), mesenteric bypass/ostial endarterectomies, carotid body tumors and carotid aneurysm repairs, complex limb redo and pedal bypasses, thoracic outlet surgeries including vascular reconstructions and brachial neurolysis, advanced venous surgeries including all forms of deep vein valve reconstructions and deep venous bypasses, including caval and portal venous surgeries.

We also perform endovascular procedures, such as complex arch and thoracoabdominal fenestrated, hybrid, and branched stent-grafts, endovascular aneurysm repair, thoracic endovascular aneurysm repair, and carotid stenting, as well as upper limb, supra-aortic, lower limb, visceral, and arteriovenous access angioplasty and stenting.

I have a special interest in venous ulceration and iliac vein stenting, and I lead our institute’s limb salvage program for the diabetic foot and perform tibial and pedal-plantar angioplasty.

Q: What are the general peripheral vascular therapy trends in India?

A: Vascular surgery has matured in India over the last 2 decades, and in at least 5 centers, vascular surgeons are able to provide a full range of open and endovascular therapies to patients. However it is not enough for a country that has a population of 1.2 billion people and is poised to become the diabetes capital of the world. Our patients are younger and have a high incidence of familial hypercholesterolemia with multiple severe risk factors for peripheral vascular disease.

This further impacts their ability to financially sustain their family’s livelihood and their cardiovascular treatments. Amputations due to delay in revascularization is a common occurrence and aggressive strategies of “door to revascularization” have been instituted in our unit, especially with the establishment of the NH-Convatec Advanced Wound Care and Amputation Prevention Centre, which educates patients and prevents and treats diabetic wounds.

Inflammatory and mycotic aneurysms of thoracoabdominal and abdominal aorta in those younger than 50 years comprise 30% of all our aneurysm cases. I have not seen this to be as big of a health problem in the West. These require a variety of complex treatments by open, endovascular, and hybrid techniques. Another pathology that is unique in our population is primary thrombotic diseases of aorta and peripheral arteries.

Our greatest challenge is to make vascular surgery and endovascular interventions affordable to the poorest patients in our society. About 30% of India’s population lives below the poverty line. Another 30% earns an income of US $100 per month. How do we make healthcare affordable in this situation?

Narayana Hrudayalaya Hospitals established a system that helps both our state government and our hospital. For those patients living under the poverty line, the government contributes US $10 and for the next 30% it contributes US $20 toward micro-insurance plans (Yeshaswini and Vajpayee) that cover each member.
of the poor population. Nearly 30 million people are covered under this plan with seed money of around US $700 million.

The government pays directly to the hospitals for services provided, in a module that puts the onus on the hospital to drive costs down. One of the ways to do that is to do large-volume work. We don’t purchase any major equipment. Because of the large volume of procedures we perform, the medical industry gives the generators and we only bill the disposables.

Another way we control costs is by using resources prudently. If an above-knee synthetic graft femoropopliteal bypass is being conducted and 7 mm PTFE graft of 80 cm length is chosen, with new sterile gloves on, the graft is divided into two 40 cm grafts so that another bypass may be performed after resterilization with ethylene oxide. Reuse after resterilization is also done for most endovascular interventional products like wires, catheters, and angioplasty balloons. Costs are also reduced by using only designated and approved products where the margin of negotiating prices of materials becomes greater due to volumes used.

Another challenge is in strict follow-up of patients. In India, follow-up data on interventions were very short term and drop-outs were the norm. Data collection and analysis were severely lacking. I established techniques of telephone interviews, severity score analyses, and return mail questionnaires for follow-up of patients. A patient who doesn’t come to the hospital gets a knock on his door by one of our research assistants, and examination and data collection is done on a domiciliary basis in many cases.

This has led to an increased number of publications and presentations from our department, and we are considered endovascular leaders for Takayasu disease, aortic aneurysms, venous ulceration, and distal tibial arterial disease in our region.

However, only 15% of endovascular interventions in India are performed by vascular surgeons; most are still performed by cardiologists. There is a need for more training of vascular surgeons in endovascular interventions to increase volumes. Our institute is not only training the next generation of interventional vascular surgeons who are competent in endovascular procedures, but also those vascular surgeons who have missed training in endovascular surgery in the past.

The future is bright for vascular surgeons as long we adapt to new technological advances and patients’ needs in the future.