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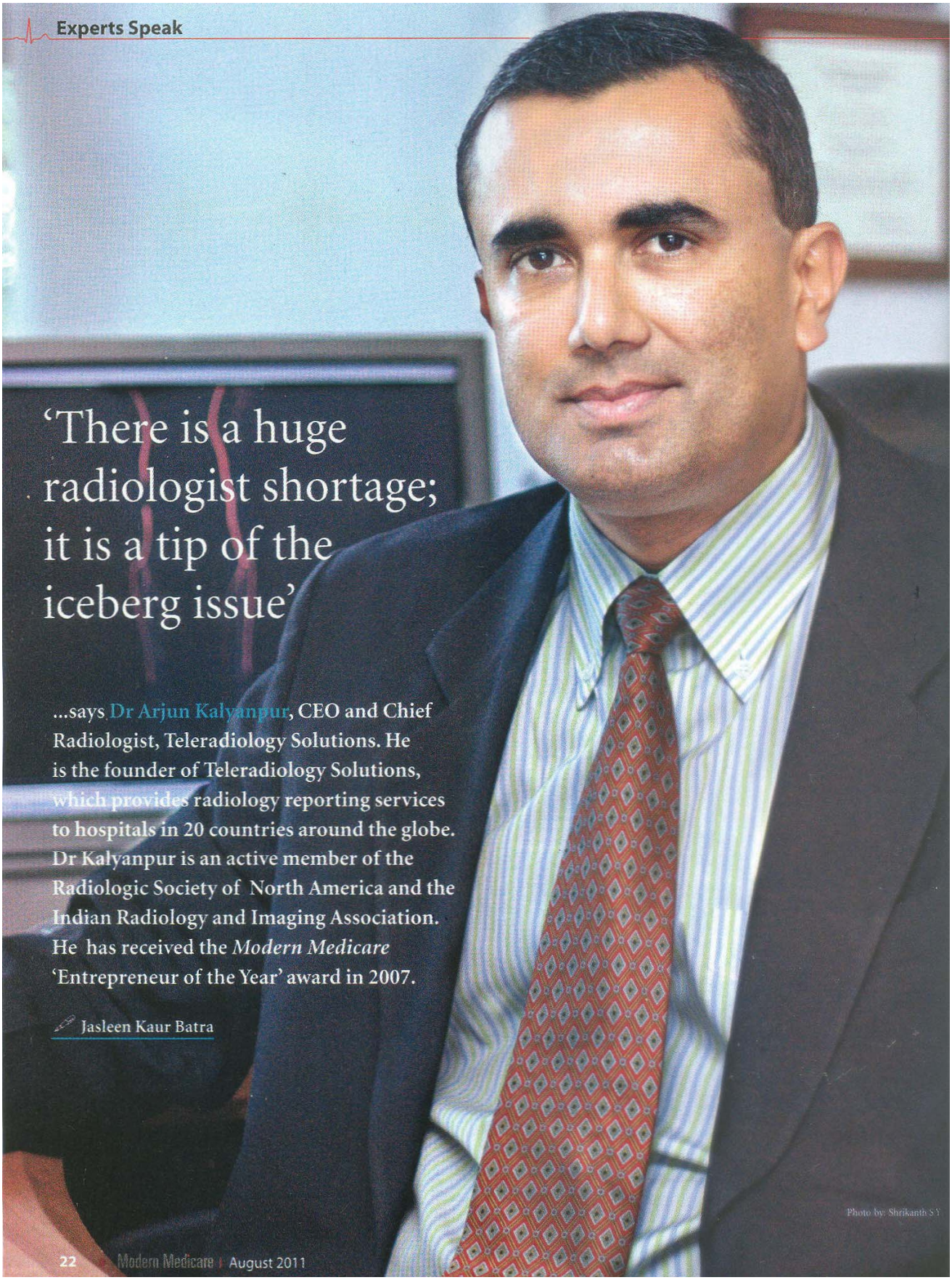

'There is a huge radiologist shortage; it is a tip of the iceberg issue'

...says Dr Arjun Kalyanpur, CEO and Chief Radiologist, Teleradiology Solutions. He is the founder of Teleradiology Solutions, which provides radiology reporting services to hospitals in 20 countries around the globe. Dr Kalyanpur is an active member of the Radiologic Society of North America and the Indian Radiology and Imaging Association. He has received the *Modern Medicare* 'Entrepreneur of the Year' award in 2007.

Jasleen Kaur Batra

Photo by: Shrikanth S Y

Why did you decide to pursue radiology?

I decided to pursue radiology a long while ago. It is an excellent field for medical graduates with a good verbal and visual sense. In essence, it requires a keen understanding of the subtleties of the radiographic image. Having analysed the image, the radiologist needs to communicate the findings in a coherent and precise manner in the form of a clinically relevant report. Most medical students do not get adequate exposure to radiology, and hence are not in a situation to understand the various benefits it offers. Job opportunities are excellent and there is great potential for medical students who have an interest in computers, technology, IT as well as good clinical acumen. This field requires a combination of all these traits. I believed I had all of them to some extent and therefore I chose to take up radiology as a profession.

What turned your interest towards teleradiology?

I did my Doctors of Medicine (MD) in Radiology from All India Institute of Medical Sciences (AIIMS) in Delhi and then went to the US in 1992 where I did my fellowship and residency in Radiology at Cornell University and Yale University, respectively. I also worked as a faculty at Yale before returning to India in 1999.

RESEARCH PROJECTS

- Emergency Radiology: Step-by-step help during emergency
- Radiology in paediatric cardiology
- Inter-organisation e-commerce in healthcare services
- Ectopic pregnancy
- Pictorial essay: CT scan of appendicitis and it mimics causing right lower quadrant pain
- Emergency radiology coverage: Technical and clinical feasibility of an international teleradiology model
- Cardiac CT vs MRI angiography for congenital health disease

When I was working at Yale, one of my responsibilities included being on night duty as a radiologist. There was a Veteran's Hospital (VA) at the other side of the town. We used to get images from the VA, they were transferred electronically to our emergency department where we did the reporting. That was my first exposure to teleradiology. At that time, it was a new and radical concept, in that instead of having a separate radiologist at night at the other hospital, one radiologist could simultaneously cover both. This was way back in 1998-99. I began to think if we could do this from one part of the town to the other, we could also do this by taking images from one part of the world to the other and instead of someone having to stay up at night you can get the same work done during the day. This is when I started to look into teleradiology from a research perspective. I did some research projects at Yale with the department there, which later got published in literature. There is a technology called 'Image Compression', which helps in reducing the size of the image file without compromising on the quality of the image, which we investigated and published. More papers followed thereafter. I have been in this profession for almost 20 years and the journey has been extremely interesting and exciting throughout.

What is your field of interest within radiology?

I did two fellowships; one in body imaging and the other in neuro radiology. I have always been interested in these two fields and my practice spans both sub-specialties. However, over the past 10 years I have also developed a keen interest in paediatric cardiology. We do a lot of imaging for children with heart disease. We use a multi-detector Computed Tomography (CT) scan. The risk of cardiac catheterisation is high in young children and CT is a fast, accurate and non-invasive alternative. So I have been exploring the applications of this technique over the past few years. One more area that has captured my interest is emergency radiology. In teleradiology practice, we provide 24x7 radiology facilities to hospitals, with reporting of emergency scans in as short a time as 30 minutes to any part of the world. This branch of radiology is an exciting and rapidly developing area that I have been focussed on as well.

For paediatric cardiology cases, we use 64-slice CT, which allows us to scan at ultra high resolution with high speed and allows us to diagnose complex congenital abnormalities literally within seconds. So far we have diagnosed over 2000 paediatric patients using this technique.

Reporting for acute stroke using teleradiology is another field that I am exploring. Generally, when a patient comes in with a stroke he/she needs to be treated immediately, since 'Time is Brain'. Essentially, we have less than 15 minutes to receive and view the images, analyse them and communicate the results. To do this effectively, we need top-notch technology and a streamlined process. We are currently in a situation where we are able to report the CT scan of a stroke patient from anywhere in the world within 5-10 minutes; 15 minutes is the outer limit for us. These areas should get more attention from radiologists all over the world as they are critical areas where radiology can make a significant impact on patient care and outcome.

What has been the most exciting phase in your career spanning over 20 years?

For me, the exciting phase has been the last nine years since I started this company because it allowed me to take an idea and build an organisation focussed on cutting edge clinical work as well as research; to create a training institution and simultaneously to explore the entrepreneur side of my personality, which I did not know existed before. It has been very fulfilling in that regard.

I started this organisation in 2002 and started to work on research

projects in collaboration with the Department at Yale. I was travelling back and forth as there were not many opportunities for overseas-returned radiologists in India. Then I convinced the department to allow me to conduct a research project where I would be reporting from India in parallel with the radiologist at the hospital at Yale. We worked in this manner for a month and did more than 100 cases. At the end of it, we found that the results were equally accurate and the timing of the reporting was the same. It was logical, but once it was published as a scientific paper it got more credibility, recognition and attention on the inter-national level. That is when this concept took off. From a research standpoint, this was the most satisfying research project as I took a concept and made it a reality.

When we began reporting scans for the Ministry of Health in Singapore back in 2005, and the Prime Minister mentioned us in a speech in Parliament, that was a very rewarding moment. When our Telerad Foundation reported the first scan free of cost for a poor patient in Itanagar Arunachal Pradesh in 2007, that brought with it a feeling of tremendous satisfaction.

Of course, receiving the *Modern Medicare* Entrepreneur award some years ago was a happy moment as well.

Kindly elaborate on Teleradiology Solution's goal and the next step.

There is a huge radiologist shortage; it is a tip of the iceberg issue. People have only started to see it now. In the US, they have been feeling this for a while already. They are still in much better shape compared to India. The US has over 25,000 radiologists for a population of 250 million people, whereas in India there are only 10,000 radiologists for a country of a billion, so we really have a crisis. For us, the challenge is to increase the pool of radiologists over the long term in an efficient way by providing good training. The training cannot just be classroom training; it has to be innovative and out-of-the-box training.

Our contribution to this has been by creating an online learning platform; we have started an e-learning website called 'Radguru' whereby we conduct training programmes for radiologists all over the world. We conduct lectures from India as well as overseas where we broadcast the lectures by our radiologist faculty so that anyone can view it online.

The second challenge is to use the skills of the existing radiologists more optimally. That is where teleradiology really helps. It saves a radiologist's time. He/she does not need to go from centre to centre, the images come to them and they can put their skills to optimal use by dedicating more time and energy to analysing the images. We have also developed a workflow software by combining the PACS and Radiology Information System (RIS) technology. We created a technology company called 'Telerad Tech' that has developed a workflow named *RadSPA*, which help in optimising the radiologists' efficiency. It allows a radiologist to spend the minimum amount of time in non-radiology activity. A radiologist sitting in a hospital spends only about 50-60 per cent time in actually reporting scans, whereas the rest of the time is spent in unrelated and typically inefficient activities. If this time spent on clerical tasks is eliminated and all the images are efficiently brought to the radiologist at a central location, then he/she can be more productive and it improves their accuracy as well. So optimising radiologist's efficiency and accuracy is the goal of our organisation and all the plans of future expansion would be made keeping this in mind.

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We started as a US-focussed company and we cater to 80 hospitals there. But over the past nine years, we have spread to 20 countries and provide day and night services. We interpret the entire gamut of imaging like CT, Magnetic Resonance Imaging (MRI), Digital X-ray, Ultrasound, Mammography, Positron Emission Tomography (PET), etc. We cater to countries such as the Netherlands, Germany, Denmark, Indonesia, Singapore, Maldives, Puerto Rico and more. We also have tie-ups with several hospitals and diagnostic centres in India. Our radiologists are based in Bengaluru, Delhi, Mumbai, Hyderabad, the US, Israel and Europe. We are a globally diverse and internationally recognised company and are continuing to grow in the same direction, keeping reporting quality as our focus.

Tell us about the Telerad Foundation.

The Telerad Foundation was established in 2007 and is dedicated towards providing services to hospitals that cannot afford to recruit radiologists or are located at places where radiologists are unavailable. We work with the Ramakrishna Mission Hospitals in Itanagar, Arunachal Pradesh and in Brindavan. This is the charitable wing of Teleradiology Solutions and we provide this reporting service completely free of cost. We also provide these hospitals with the necessary technical support. We are also working towards creating low cost technology for teleradiology and telemedicine. Teleradiology is a great platform for all radiologists to come together and provide services to the people. We are trying to create a cost-effective manner so that more people join this circuit and be benefitted by it. MM

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