

PET- CT takes off at RGCI&RC

After a simple puja on 18th January, 2008 our first patient was rolled in the gantry room of PET CT scanner. We went on to scan 10 patients on day one. Our machine is a Tru point Biograph 40 from Siemens. It is based on high resolution LSO crystal technology which can easily detect sub cm lesions which have FDG activity. It also has a 40 slice CT scanner which acquires CT scans of 0.6 mm and 1.2 mm thickness. All this makes our PET CT scanner the most advanced in the country. The strength of our PET CT goes beyond its technical supremacy as we are combining a contrast enhanced CT scan in the same sitting. A joint report by the radiologist and nuclear medicine physician is generated which answers most questions in oncology.

This hybrid technology combines the strengths of two well-established imaging modalities in one imaging session to more accurately diagnose and locate cancers while increasing patient comfort. With PET-CT, physicians can make more accurate diagnoses, develop more targeted treatment plans, and do better, less-invasive treatment monitoring, which should result in improved patient outcomes.

A PET-CT scan is noninvasive, painless and takes about 20 minutes. Along with providing better imaging data, it notably increases patient comfort and convenience by reducing the number of scanning sessions a patient must undergo. PET by itself monitors the biochemical functioning of cells by detecting how they process certain compounds, such as glucose. Cancer cells metabolize glucose at a much higher level than normal tissues.

By detecting increased glucose use with a high degree of sensitivity, PET-CT identifies cancerous cells -- even at an early stage when other modalities may miss them. CT, or computed tomography, yields a detailed picture of the body's anatomical structures by taking cross-sectional images or slices of the body. While CT does an excellent job of depicting structures and anatomy, it may miss small or early stage tumors before structural change has taken place.

The combined PET-CT machine allows physicians to rapidly perform both scans in one session without having to move the patient. This means physicians can precisely overlay the metabolic data of the PET scan and the detailed anatomic data of the CT scan to pinpoint the location and stage of tumors. Clinical research has shown that in comparison to a PET scan alone, PET-CT technology provides new information that can alter a patient's treatment plan to better target the cancer.

For example, the PET-CT scan of a lung cancer patient may reveal not only the original tumor on the lung -- which a CT scan detects -- but an additional tumor the CT can miss like a small, early stage lesion in the neck. Based on the CT alone, the physician would have recommended surgery, but the additional tumor found by PET-CT indicated that the cancer had spread and was inoperable. Based on this information, surgery will be avoided giving the patient a more favourable treatment option with RT and chemotherapy.

The worldwide growth of PET CT procedures is exponential and is expected to continue, with procedure volumes rising to 2.1 million by 2010. PET-CT has been adopted very rapidly both in the U.S. and internationally. By 2010, U.S. bookings for PET CT machines will increase to 620 units with sales of \$1.094 billion. Worldwide bookings will reach 1,053 units and \$1.969 billion in sales volume. The proportion of international sales continue to rise from 34% in 2003 to an expected 45% or higher by 2010.

A PET-CT scanner is a highly valued asset of cancer hospitals across the world. It provides value addition in diagnosis and management of cancer patients. The addition of a PET CT

scanner at RGC&RC will always be remembered as a landmark in the history of the institute and will provide immense contribution in taking management decisions in oncology patients.

Dr Arvind K Chaturvedi

Medical Director and Chief of Radiology