Imageology and Clinical Examination: Two Sides of the Same Coin

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ABSTRACT

The continuous and rapid transition of techniques from research lab into clinical practice has been the pattern of development in radiology and imaging, and this has put the concept of clinical imaging into a different perspective. From a passive role of pattern recognition, distinguishing a radiograph from normal to abnormal, the task of a radiologist today has been elevated to reporting a comprehensive clinical imaging assay, giving information at a level profound enough to be useful for scientists working in allied fields. A peep into the literature shows how radiological and clinical examination can be two sides of the same coin.

Keywords: Clinical examination, Diagnosis, Imaging.

INTRODUCTION

An image is the representation of a real or virtual object, though, for use imageologists, it is the real object that matters. Although human brain can conjure up images of both perceptible and intangible objects, in the realm of medical imaging, we largely deal with perceptible images of tangible, though often inaccessible objects. The interpretation of the images, however, involves many unseen thought process and levels of sophistication only the brain can contrive.

Medical science thrived and flourished out of man’s eternal curiosity and fascination for his own body and his urge to unravel its internal mysteries. Roentgen’s discovery of X-rays revolutionized his efforts and paved the way for ‘looking inside’ the body from outside. Indeed, the X-ray has given access to every nook and corner of the human body and, 100 years on, it continues to be the cornerstone of many imaging modalities.

Technological progress in the last three decades has been awesome in every sphere of human endeavor and contributed to the advancement of medical science through the accelerated pace of scientific research. The continuous and rapid transition of techniques from research lab into clinical practice has been the pattern of development in radiology, imaging and intervention over this phase of time. Few fields in clinical medicine have shown more innovative and often sensational strides in recent times as diagnostic imaging and its therapeutic applications. Apart from refining and perfecting X-ray systems and techniques, pioneering imaging modalities and technologies like CT, MRI, ultrasound were developed and utilized. Thus, in the 105 years since Roentgen’s ‘new kind of ray’ surfaced, technology has grown leaps and bounds, transforming diagnostic imaging into a sophisticated science with ever-broadening clinical applications intervention radiology has added a whole new dimension and scope to medical practice itself, substantially altering the treatment options for several ailments. All this has put the concept and role of clinical imaging into a different perspective with growing relevance.

Radiological practice over the years went alongside its mainline clinical specialties and although the system continues, the current exalted status of radiology gives its proponents a niche of their own. Gone are the days of the armchair radiologist who, in the eyes of the public and even for educated medics was just a technician who pored over some films and predicted some diagnosis. The radiologist’s role was one of pattern recognition; whether a radiograph was normal or abnormal. Often he has to be content in saying a lesion is present without giving a definite pathological diagnosis. The tolls at his disposal has transformed the radiologist today, elevating his task of reporting to a comprehensive clinical imaging assay, giving information at a level profound enough to be useful for scientists working in allied fields.

But, radiologists are not magicians to let rabbits out of their hats. Once the initial task of procuring a quality image is achieved, then starts the all-important business of interpretation, and here comes the need to flip the coin over! An image can be interpreted as a technical exercise, this pays little dividends. As Sir John Caffey always exhorted, the radiologist should always strive to provide the patient the radiology he deserves; and not the radiology the clinician wants. These, at times conflicting interests, can only be served by a concerted effort by the radiologist to stay abreast in his field and allied sciences and maintaining a warm rapport with his clinical colleague.
Let there be no doubt that the radiologist is no less a clinician than anyone else. To extract the best out of any image and give it scientific meaning it must be analyzed the backdrop of the clinical history, findings, laboratory data, previous imaging information, etc. It is the radiologist’s prerogative to see the patient, gather history, undertake clinical examination and analyze lab data if he so wishes. This should not cause a confrontation in any mature scientific environment. It cannot be overemphasized that clinical information and imaging findings are mutually complementary as much as the radiologist and his clinical colleague are two different reliefs on either side of a coin; the common core being the patient at the center of their interests.

Today, imaging permits fundamental clinical decisions to be taken quickly. In many acute situations like strokes, trauma, abdominal emergencies imaging is key to further management. An image can be out rightly diagnostic, may confirm or disprove a diagnosis, may reduce the differentials to a handy few. A complex and multisystem disease invariably requires imaging support to make some advance. It provides an easy tool to assess the extent of disease spread and is invaluable in staging neoplasms. Diagnostic biopsies, curative aspirations are easily done under imaging guidance, avoiding many surgeries. Pattern recognition supported by clinical data allows confident diagnosis of several diffuse, complex and often bizarre processes involving tissues like lung, brain liver, etc. where tissue diagnosis may not be feasible. Imaging permits easy non-invasive follow-up of patients. Often imaging is undertaken just to document a known abnormality. Interventional radiology has paved way for rewriting earlier textbooks regarding managements of several diseases. Today, minimally invasive radiologic procedures can handle vascular problems involving brain, kidneys, central and peripheral vessels which would have required major, adventurous surgery. Currently available high precision gadgets allow entry to surgically inaccessible beds. Another major advantage is that most of these procedures can be repeated many times over, unthinkable with open surgery. Technology has raised imaging to new heights where intrauterine interventions are now done to correct fetal abnormalities as soon as they are detected. All these interventions require wholehearted teamwork and close, almost symbiotic cooperation between the two technologists. These must be instances when even the two sides of the coin moulds back into an amalgamated whole striving for a solitary goal—the best outcome for the patient. In fact, this captures the essence of all an amalgamated whole striving for a solitary goal—the best

A high percentage of today’s clinical work in imaging depends on well-established radiological techniques, the interpretation of the image being dependent on clearly defined and accepted anatomical and pathophysiological correlations. This basic corpus of accepted knowledge must, however, be kept up-to-date by the specialist. Keeping pace with expanding knowledge in medical science is a major challenge. One way to deal with this problem is to broaden the knowledge base of everyone who later specializes as a career choice. The liberal education of the radiologist is the cornerstone of all radiological practice. One approach has been to subspecialize, thereby narrowing the range of knowledge required to do a good job, but in doing so, we have in many instances diminished the role, content and generalism in radiology. Einstein used to say that no man can ever learn everything in this world, the ultimate you can go is appreciate the mysterious. The effort must be to specialize within the realm of holistic science. The radiologist must be a competent generalist prior to any specialization. Most of the questions faced by the physician and to some extent, the radiologist, can be addressed by the competent that has extensive general experience. It is important that radiology maintains its role in integrating the various disciplines involved in medical care. For that, the personnel involved must have an appreciation of the breadth and scope of the entire field. There is certain symmetry between the need for competent general radiologists and the public clamor for primary care physicians. The push for primary care is in reality a demand for generalists who can handle most of the problems with which patients present. Some 80% of patient problems can be well-managed by a general physician and do not require more specialized medical care. That percentage may well be the same in radiological practice. A common and vital function of clinical medicine and thereby diagnostic imaging is the confirmation of normality in an anxious patient. In this regard, general radiologists play an important role when working closely with primary care physicians. The range of normality in something as basic as a chest X-ray is so wide to baffle a clinician and a radiologist’s experience and judgment helps alleviate many difficulties. Fewer patients will need tertiary level attention if competent radiologists work in tandem with competent physicians in primary care. It is of mutual educational value for the clinician and radiologist to discuss those patients who present diagnostic problems and as stated before, this collaboration is of paramount benefit to the patient.

Imaging science has kept pace with the developments and has been at the cutting edge of advances in technology ever since the introduction of newer imaging modalities, like CT and MRI, infact which are the greatest breakthroughs in imaging
science since the discovery of X-rays themselves. These pioneering innovations moved the speciality, from conventional methods of static imaging providing purely anatomical information to more dynamic options helping to acquire useful pathophysiological data. Thus radiology has caught up with the pathologist to certain measure. Let us also remember that the pathologist himself requires radiological correlation quite often before pronouncing his verdict.

Probably, no field of medicine is advancing as rapidly at present as imageology. Technological advances have elevated diagnostic imaging to the level of a sophisticated science, to the extent that images are more easily interpretable as straightforward representations of anatomy. But science, scientific education and medical practice are evolutionary processes that require constant tuning, refinement and overhaul of its faculties. The imageologist apart from being adept in his chosen field requires equipping his mind simultaneously to be handy physician, a surgeon, a pathologist and an effective therapeutist. Only then can he make efficient use of the technological marvels at his disposal, upgrade his acumen and utility and contribute to the advancement of medical science itself. An eclectic mind is in the best interest of any scientific profession so long as it does not encroach into another’s territory; because in imageology, more than any other field, the eye does not see what the mind does not know. Radiological practice with a flawless clinical attitude and aptitude alone will thrive in a ruthlessly competitive world and help maintain the pivotal role radiology has in integrating the various disciplines involved in medical care.

Images are not mere shadows for the clinician to ignore. If he does, he loses. If the imageologist fails to find life in them he is doomed and should hear them lament:

- If we shadows have offended
- Think but this, and all is mended
- That you have but slumbered here
- While these visions did appear

REFERENCES