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Challenges of the New Mobile Age -How Will It Affect the Radiologist?

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The reporting of a radiogram is, in fact, the task of a logical-minded and experienced detective. Similarly to Sherlock Holmes solving his cases, a radiologist works with the method of analysis, induction and deduction. He observes a summary picture of the chest (that is, the “lung X-ray”). His wide-ranging medical experience in physics, chemistry and biology tells him the causes of the opacity and clearing and what is the presumed tissue composition.And of course, using his knowledge of topographical anatomy, he knows precisely the anatomy of the individual organs in the human body, the relations of these organs and can convert them into a twodimensional picture.

The Art of Imaging

At this stage, the radiologist (you may visualise him in “action”, sitting comfortably in his leather-upholstered armchair with a glass of Pétrus 89, while the rich taste of the wine fills his senses) already knows that a round opacification in the right upper lung area, which is homogenous with a caudal concave margin (its density is higher than that of the lung) and attacks mediastinum (retractive process – probable indication of fibrosis or atelectasis) is localised in the lung parenchyma.

Our radiologist grabs the related paperwork, placing his glass on the mahogany cover of his desk, the aesthetic effect of which is only marginally sullied by the presence of a computer monitor, and from the data stated on the forms discovers that that the patient, a 63-year old man, has been suffering from a dry cough for some time, without raised temperature and high sedimentation. Reflexively, he smells at the form that the patient held in his 63-year old hands and detects the soft aroma of Caledonian Highland Cream: “Elementary, my dear Watson – a heavy smoker, with good taste”, he declares. After a short while, he calls in his secretary and begins to dictate the now evident, though sad diagnosis: Pancoast carcinoma.

However, offices are rarely filled with mahogany tables, but rather grim, monochrome furniture, alcohol is not permitted during working hours and in any case, very few doctors can afford to indulge a love of rare vintages. But that wonderful feeling of cogitation, the ‘eureka’ moment when things start to fit together and stop being just data that we have to memorise, that can still be experienced. Nevertheless, deep theoretical knowledge is necessary for that. And its basis is a detailed understanding of anatomy.

More than Mere ‘Reading’

With the development of display methods, there comes an ever more precise displaying of individual organs of a human body which increases the demands on anatomy during the evaluation of film documentation of the patient. With slight hyperbole, it is possible to say that the description of X-rays is a demonstration of excellent knowledge of anatomy. What is “additional” in the picture is a pathological finding then. While evaluating a radiogram, we demonstrate daily how much the quality of a doctor depends on the deep knowledge of pre-clinical and clinical domains.

These days, radiology can be divided into:

• Diagnostic radiology, where the aim is to determine the most accurate diagnosis from a carried-out standardised exam. The radiologist makes an assessment based on image documentation rather than the exam itself;

• Interventional radiology, where the aim is to carry out a therapeutic or diagnostic operation. The image documents this operation;

• Virtual radiology, where the radiologist processes acquired data by various computer programmes to reach the most accurate findings and new

views of the organs (virtual colonoscopy).

The classic notion of a radiologist running around the dark room, the exam room and the description room has disappeared. This development is mainly due to digitisation, DICOM, PACS, HIS, RIS, and the universal usage of English as the communication language – software is mostly in English these days as is manipulation with equipment using manuals and software in English for both radiologists and radiological assistants. The result of two hundred years of development is the increasing mobility of radiology and radiologists. This mobility has several levels.

Teleradiology

The essential benefit of teleradiology is the possibility to consult with specialists anywhere in the world within a few minutes. Complex cases can be solved much faster in such instances, which certainly brings a significant quality leap in the treatment and care of the patient.

A radiologist need not always be physically present at the workplace. Though the possibilities of “on-line description” have no boundaries, it brings certain hazards.

A radiologist from an underdeveloped country is willing to describe the radiogram for much less than a radiologist from an economically strong country, devaluing his role. It becomes not a result of clinical-radiological correlation or decisions of indication boards in combination with the knowledge of the state of the patient, combination with the knowledge of the state of the patient, but a mere description of pictures. The radiologist him/herself gives up the possibility to communicate with the patient and the doctor and taking an active part in the treatment. That wonderful ‘eureka’ moment described earlier is no longer a possibility.

Mobility of Documentation

The common image from the movies, when the doctor carries a hard-copy radiogram and observes it against the light is now a matter of the past. The radiogram as such is now deposited in electronic databases of hospitals and the doctor can inspect it practically from any place in the hospital or outside of it. With the aid of portable computers and wireless networks (Wi-Fi) it is possible to open any data from the patient. So it often takes only seconds between the making of a radiogram and the moment when it is possible to examine it on a PC.

This way, documentation mobility can be divided into two classes. The first is radiograms for radiological evaluation, when the common standard these days is the fact that at his diagnostic station, a radiologist can evaluate the pictorial documentation from several modalities that are located in various places in the hospital (or outside of it). The other class consists of radiograms made for an attending physician, whether an internist or surgeon at the operating theatre. It is the combination of wireless networks with the everincreasing display quality on portable computers, “tablet PC”, PDA or MDA also enables the clinician to have the pictorial documentation right at the patient’s bed during the ward rounds. It is a state similar to the carrying of films around, but today the essential advantage is the direct connection with the digital archive and therefore the possibility of displaying an arbitrary snapshot of a patient (for example five years old), without the necessity to fill in complicated forms for the radiological ward.

What Does ‘Mobility’ Mean in Practice?

I am spending my holiday in Turkey. At noon, my family is resting in the hotel room. I have connected my notebook PC and am going through some interesting exams from our hospital in Brno. Then I consult the pictorial documentation of a patient from Vyokov responding to the request concerning the most suitable treatment procedure. I prepare this article and send out a poster to the radiological congress. I also attend to the correspondence in our hospital network. And that is the other exasperating cheek of mobility in radiology – freedom on the one hand, on the other hand – work will catch me anywhere in the world.

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