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EDITORIAL

Anatomy and medical imaging: a symbiotic relationship

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In 1895, the anterior-posterior plain radiograph of the left hand of Anna Bertha, the wife of Professor Wilhelm Conrad Roentgen, physicist in Würstburg (Germany) was the first step of medical imaging [8]. For almost one century, X-ray projection was the unique tool available for depicting the human body; what is now called medical imaging was then called radiography. Directly, X-rays allow only accurate imaging of the bones and the lungs. Direct soft tissue depicting by X-ray projection is very poor, but progressive use of varied contrast media brought an important contribution to the field. Through their injection into the blood or the lymphatic vessels, as well as into various organs or anatomical spaces, such as the joints, the digestive tract, the subarachnoidal space, etc., these contrast media have gradually enlarged the spectrum of exploration by X-rays.

In the 1970's, the advent of computed tomography (CT) [1–3], paralleled by ultra-sonography (US) [4] and, later, that of magnetic resonance imaging (MRI) [6] opened the field of cross-sectional imaging and really revolutionized the field of radiography by moving it into true medical imaging. A new era had begun: the anatomy of living human beings could be depicted by this truly new field in the medical practice [7].

Within the last two decades, there have been other dramatic improvements observed. Today, medical imaging allows for visualizing long fibrous structures such as the bundles of white matter of the brain through diffusion tensor imaging, as well as depicting the human brain in activity with functional MRI, or imaging motion of the joints, among others [5].

It must be underlined that the tremendous progress in the field of informatics has paralleled that of imaging technologies. As a unique example, the plain radiograph film has almost completely been replaced by digital images.

Continuous technical progress is changing the capability of medical imaging techniques almost every day, currently allowing for more and more accurate anatomical studies of living human beings.

The aim of this special issue of Surgical and Radiologic Anatomy is to illustrate a large number of the modern medical imaging techniques as well as how they can be used for proper anatomical applications.

It has been composed by an international panel of authors and offers particular insights into the main modern imaging methods, by covering a wide range of anatomical topics. They include head and neck, central nervous system, abdomen and pelvis, musculoskeletal system, and vessels. They have been sorted according to the kind of imaging technique in order to illustrate the spectrum of implementation for each of them.

A general review purposes an overview of the main recent advances in the field of medical imaging especially in order to highlight their potential anatomical applications.

The pedagogical section is devoted to anatomical drawing. Obviously, it has no specificity to medical

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imaging. It merely aims to remind us that in teaching anatomy, it still remains the basic and true companion of the wonderful tools that constitute the sophisticated and up-to-date imaging techniques in this field.

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