WEB-BASED INTERACTIVE APPROACH TO NEURORADIOLOGIC IMAGE DATABASE FOR TRAINING OF MEDICAL STUDENTS

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Purpose: We present a novel web-based interactive module for teaching of neuroradiologic imaging fundamentals to medical students.

Introduction: During the pre-clinical years of medical education, students have a limited understanding of neuroradiologic findings associated with common neurologic conditions, even though such training would enhance the students' appreciation of brain and spine disease pathophysiology. This relationship may result from the heavy dependence of image interpretation on tacit knowledge compared to codified knowledge. As a part of the Interactive Case-based Online Network (ICON) learning modules\(^1\) embedded in the human nervous system and behavior curriculum, we developed a database of exemplary radiographs with key normal and abnormal radiologic findings that actively engages the students to learn through experience in addition to the classical textbook-centered teaching.

Methods: The image database can be used and sorted either by the neurological condition or by the imaging modality. For example, the student can learn the imaging of ischemic stroke or the clinical applicability of Magnetic Resonance Imaging (MRI). Each set of studies of a particular patient is supplemented with relevant medical history and symptomatology. In the Tutorial Mode, the student is presented with radiographs that have labeled and highlighted typical imaging findings. In the Quiz Mode, the student has a queue of unsolved cases which need to be diagnosed by pin-pointing the relevant abnormalities with the aid of an online menu of tools and identifying the appropriate condition from the pull-down menus. The cases in the Quiz Mode are sequentially of greater difficulty, allow for real-time feedback, and cross-link to the Tutorial Mode examples for explanation.

Results: A case example (see figure) from the Quiz Mode presents the student with two images of neck vasculature (2D TOF MRA and CTA) in ischemic stroke attributable to carotid disease. The Arrow-ID tool (red arrow) allows the student to identify relevant anatomy using a proximity-activated, pull-down menu. The Circle-ROI tool (red circle) allows the student to single out a region of interest (ROI) that represents the key finding in the case study and also activates a descriptor menu.

Conclusions: We describe a simple, readily accessible and interactive model for teaching of clinically relevant neuroradiology principles appropriate for pre-clerkship medical training. This web-based interactive approach to neuroradiologic training will allow medical students to enhance their textbook-derived knowledge with the experience of solving real medical cases.


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