



## Diagnostic and Interventional Neuroradiology: Who Should Do and How?

*Tanısal ve Girişimsel Nöroradyoloji: Kimler Nasıl Yapmalı?*

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### Diagnostic and Interventional Neuroradiology: Who Should Do and How?

Medicine was divided into different areas in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries to manage accumulated information and to present better treatments to patients. Neurological sciences were also affected by this development; neurology emerged from internal medicine and neurosurgery emerged from general surgery. This change occurred worldwide; however, this trend changed in time from method-based specializations (surgery or internal medicine) towards organ-based specializations. Clinical and surgical specializations occurred in different components in specialties such as gastroenterology within surgery, and in specialties such as ophthalmology and otorhinolaryngology. Specialization in neurological sciences evolved in neurology and neurosurgery because its clinical area was very large and its surgery was different from other surgeries. The appearance of very effective diagnostic methods in neurological sciences and the routine use of metabolic and parametric images in addition to morphologic imaging caused the emergence of neuroradiology as a separate subspecialty in neurological sciences. This process became more complex after the second half of the eighties when spectacular developments occurred in endovascular methods for the treatment of neurovascular diseases, and therapeutic neuroradiology started to be used together with diagnostic neuroradiology. This fragmented structure in neurological sciences became more chaotic considering that neurosciences was a basic science located apart from clinical sciences. In continental Europe, neuroradiology developed as a subspecialty of radiology, whereas in North America and Asia therapeutic and diagnostic methods were divided; diagnostic neuroradiology stayed in neurology practice; however, endovascular treatments continued to be between neurosurgery

and radiology in North America and developed as a branch of neurosurgery in Asia. While the process evolved in such directions around the world, in our country diagnostic and interventional (endovascular) neuroradiology developed as a branch of radiology and neuroradiology departments were established in several universities. During this period, angiographic procedures were performed in some neurology clinics but interest in endovascular methods stayed at a low level in the departments of neurosurgery. After endovascular treatments started to be used routinely for the treatment of aneurysms because of several studies such as the International Subarachnoid Aneurysm Trial, interest of neurosurgeons in interventional procedures increased. Currently in our country, diagnostic neuroradiology remains as a branch of radiology. However, the situation is different in interventional neuroradiology. Despite years of hard effort, no legal regulation has been made and therefore interventional procedures at various difficulty levels are performed or attempted by several specialties. The leading position of our country in interventional neuroradiologic procedures has been possible owing to the efforts of radiologists educated in this topic. Currently, one of the two workshops on regarding neuroradiology and neuroendovascular treatments is performed by the neuroradiology society. Several neurology and neurosurgery departments also try to organize such meetings.

After determination of the current status in our country, the question of 'Who should perform neuroradiologic interventions and how?' can be answered more clearly. Considering basic ethical principles of medicine, to protect health and to treat existing diseases, the answer 'neuroradiologic interventions should be performed by doctors who received a formal education on this topic' is not arguable. Therefore, opposing educations in the form of "see one, do one, and teach one" and the unacceptable risk of

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patients' health by physicians who were 'educated' in this way is a requirement of medical ethics. We can discuss the topic 'where will this education be given and to whom will it be given?' after this basic fact is resolved. Like all areas where human beings are present, self-assessment is necessary in medicine to assure the quality of health care and the reliability of the produced knowledge. Thereby doctors who produce healthcare and information together can monitor each other with "checks and balances" and "self-referral," which is an important worldwide problem of medicine can be avoided. If diagnostic and interventional components of neuroradiology and neuroscience components that include clinical (neurology) and surgical (neurosurgery) domains are practiced separately, development of the aforementioned problems will be unavoidable. Considering the basic fact that neuroradiologic procedures should be performed by doctors who received formal education on this topic, an immediate step forward should be to determine doctors from which specialties will receive this

education and for how long the education should last. After these topics are determined, the decision should be made as to whether a separate neuroradiology department should be established or to select a department under which neuroradiology will be located. Doctors that come from different specialties to neuroradiology should cut relations with their original departments and work solely in the neuroradiology department. As a last word, being a neurologist, neurosurgeon or radiologist is not sufficient to perform interventional neuroradiology. Education is necessary to avoid the malpractices we frequently come across within our country, and performance of neurological interventions by physicians who have had no formal interventional neuroradiologic education should be banned.

### ***Ethics***

*Peer-review: Internal peer-reviewed.*