

The History of Neuroscience and Neurosurgery in Iran

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Science, as one of the most important human heritages, is provided by unbearable efforts of scientists during human history and transferred through centuries and civilizations. In the last centuries of human history, popularity of access to science was established by introduction of print and computer technologies. This situation has led to tremendous increase in data and scientific findings. Neuroscience was also one of those branches which have shown great advances. Various findings in the nervous system had resulted to tremendous amount of data which in itself may be considered as a source of confusion. In my point of view, focusing on developmental, system, and translational neuroscience may be regarded as the main goals of the International Neuroscience Journal (INJ)

Interdisciplinary approach is the common and main issue in these topics. To my knowledge, this approach is prof. Samii's manner as well as his great desire to teach people from different countries in five continents.

In Iran, dealing with neurosurgical lesions goes back to several millenniums ago. Eftekhari B. et al (1), and Mallin R et al (2) have presented trephined skulls found in archeological excavations in Iran. The first report was from Shah-e-Sokhteh in southeast Iran which is the ruins of an old civilization in Bronze Age (3). This settlement appeared about 3200 BC. In December 2006, archeologists discovered the world's earliest known artificial eyeball from excavations in this city. The second article refers to a trephined skull found in excavations in northwestern part of Iran in Dinkha Tepe and investigations revealed its age to 800 to 1200 BC (2). Both of these skulls exhibited some healing process and new bone formations which indicate the victims had survived after surgical procedures.

Modern neurosurgery was founded by prof. Samii I. and prof. Ameli N. in 1951. Both professors worked in Hezartakhtekhabi Hospital of Tehran University. Before this period some neurosurgical procedures, mainly trau-

matic lesions, were treated by general surgeons. Prof. Adl Y. was one of the most famous general surgeons who even performed elective neurosurgical operations (e.g. disc surgery).

Neurosurgical wards were established in Sina and Shariati hospitals of Tehran University in 1969 and 1974 respectively. Prof. Ameli and Prof. Samii trained several neurosurgeons. Some of these second generation of neurosurgeons were recruited in other Iranian universities. Meanwhile some other neurosurgeons trained in European countries and United States came back to Iran and started to work in different universities. Based on rigorous efforts of two before mentioned pioneering professors and the hard work of this second generation, many young neurosurgeons were trained. Eight years of imposed war encountered this group an intolerable duty regarding traumatic cases, with unaccountable burden on the Iranian society. Among the second generation of neurosurgeons who had the responsibility of training and fulfilling the country's requirements, the following professors should be mentioned (in alphabetic sequence): B. Aarabi, K. Abbassioun, K. Parsa, S. Panahi, A. Jahanshahi, K. Hadadian, H. Rahmat, H. Saleh, A. Morshed. Their great efforts were the footstone of all following developments in Iranian neurosurgery.

Nowadays more than 600 neurosurgeons are working in the country and many universities have residency programs. Many imaging facilities are established and there is easy access to modalities like C.T. Scan or MRI and electrophysiological testing. Currently there are two PET scans working in Tehran and nearly in each province there are nuclear medicine facilities.

The Iranian Neurological Surgery Society was founded in 1975 and was accepted as a member of the World Federation of Neurosurgical Societies in 1976. Currently prof. H. Rahmat is the president of this society. There are regular meetings held by this society twice a year in national and interprovincial levels.

Today Iranian neurosurgery is faced with some challenges such as specialization (in from of fellowships or subspecialty), establishing nationwide guidelines, medical equipment shortage, and tariffing. The latter, when compared with the inflation rate during the last five years, has produced great confusion among administrative bodies and neurosurgeons, and has diminished the budget for necessary development. Sanctions have had a dual effect; from one side they have reduced the ability to buy some modern equipment such as some models of microscopes and navigations, and from the other side they have pushed the country toward producing these equipment, for example neuronavigations which are now being manufactured in Iran.

Apart from neurosurgery, other fields related to neuroscience have also been developing in the past years and now there are active and up-to-date neurology centers and research centers on neurosciences. Neuroradiology has also been developed and currently many intravascu-

lar approaches are performed either by neurosurgeons or neuroradiologists or neurologists. Neuroscience research was founded in ShahidBeheshti University by establishing the Neuroscience Research Center in the year 2000 by Dr F. Moatamed . Other Universities have also started some kind of research in neuroscience and some have active research centers on this topic. The Iranian Ministry of Health and Medical Education approved a neuroscience PhD program in 2007. In the year 2012 the Iranian Society of Neuroscience was established. Now there is a great desire to work on clinical and basic topics with an interdisciplinary approach.

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