



History of Neurosurgery in Democratic People's Republic of Korea

Kee B. Park¹, Young Han Roh², Owen Lee-Park³, Sophie Park¹

Key words

- History
- Neurosurgery
- North Korea
- DPRK

Abbreviations and Acronyms

DPRK: Democratic People's Republic of Korea

FIENS: Foundation for International Education in Neurological Surgery

KAMA: Korean American Medical Association

WFNS: World Federation of Neurosurgical Societies

From the ¹Department of Neurosurgery, Preah Kossamak Hospital, Phnom Penh, Cambodia; ²Department of Neurosurgery, Pyongyang Medical College, Kim Il Sung University, Pyongyang, Democratic People's Republic of Korea; and ³Cornell University, Ithaca, New York, USA

To whom correspondence should be addressed:

Kee B. Park, M.D.

[E-mail: keepark@yahoo.com]

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EARLY HISTORY OF NEUROSURGERY IN DPRK

When Korea was liberated from Japanese occupation following surrender of Japan in 1945, it tragically underwent a division at the 38th parallel to form two separate countries: the Democratic People's Republic of Korea (DPRK) in the north and the Republic of Korea in the south. During Japanese occupation (1910–1945), neurosurgery was not an established surgical specialty in Korea. However, records from the Severance Hospital in Seoul reveal that many neurosurgical procedures were performed before 1945: spinal tumor removal, lumbar sympathectomy, and the first case of craniotomy using a Bovie and a Gigli saw by Dr. Ki Sup Lee in 1943. A monograph titled “Treatment of Tubercular Spine” was also published during this period (2, 3). During the Korean War (1950–1953), general surgeons performed basic neurosurgery on soldiers with head

Neurosurgery in Democratic People's Republic of Korea (DPRK) has undergone remarkable progress since its beginning in the 1950s. With the initial support from socialist countries of the Soviet bloc, especially Professor Constantin Arseni of Romania, the nation has consistently produced a number of its own neurosurgeons each year and fostered further advancement by establishing the Korean Neurosurgery Association (DPRK). Despite the recent international collaborative activity for North Korean neurosurgery—namely with Foundation for International Education in Neurological Surgery, World Federation of Neurological Surgeons, and Korean American Medical Association—the sparse exchange of information, knowledge, and surgical skills still remains largely inadequate.

injuries. After the war ended in 1953, DPRK began rebuilding the nation with the aid of socialist countries in the Soviet bloc. In 1953, a team of Romanian neurosurgeons led by Professor Constantin Arseni (1912–1994) traveled to North Korea to teach neurosurgery at Pyongnamdo Hospital. Thus began a special relationship between Romania and DPRK, which lasted well into the 1980s. The first North Korean surgeon to be trained by Prof. Arseni was Chun Ho Park, a graduate of the Harbin Medical University in China. This makes Dr. Park the first North Korean neurosurgeon in DPRK. Subsequently, Dr. Park and Prof. Arseni trained Professor Il Ro Choi. Prof. Choi had attended university in Romania, majoring in engineering. He contracted tuberculosis and returned to DPRK, where, serendipitously, he found himself translating for Prof. Arseni. This exposure to neurosurgery inspired Prof. Choi to become a neurosurgeon himself. Prof. Choi would eventually become the first president of the Korean Neurosurgical Society (DPRK) and head of neurosurgery at Pyongyang Medical College (PYMC). Prof. Choi trained a young neurosurgeon named Young Han Roh, who is the current head of neurosurgery at PYMC, as well as the president of the Korean Neurosurgical Society (DPRK) (4, 5)

Other Romanian surgeons who participated in training North Korean neurosurgeons include Dr. Lenke Horvath (1920–1992) and Prof. Vlad Voiculescu

(1913–2001) (4). In 1985, the World Health Organization sent a Hungarian neurosurgeon to DPRK for 6 months. A used microscope from East Germany, as well as a Sugita head frame, was sent to Pyongyang during this time. DPRK also received a bipolar electrocautery machine from Dr. Kanno of the Fujita Health University in Nagoya, Japan (5). We also learned that Prof. Arseni was trained by Professor Dumitru Bagdasar, the father of neurosurgery in Romania. Prof. Bagdasar in turn trained under Harvey Cushing from 1928–1929 in Boston (1). Therefore the neurosurgeons in DPRK can trace their history to Dr. Cushing (Figure 1).

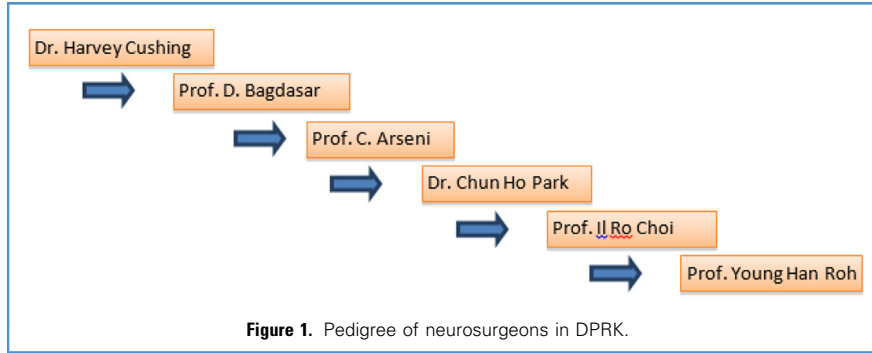
KOREAN NEUROSURGICAL SOCIETY (DPRK)

Formed in 1977, the society has represented neurosurgeons in North Korea and has helped organize numerous conferences. The president of the society today is Prof. Roh with Dr. Nam Hok Lee as secretary. Ten members are on the executive board. The history of the meetings can be seen in Table 1.

NEUROSURGERY IN NORTH KOREA TODAY

The DPRK health care system is centralized. Patients who are seen locally and are determined to exceed the capabilities are referred to the provincial hospital and then subsequently to the

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hospitals in Pyongyang: the Pyongyang Red Cross Hospital (PRCH), Pyongyang Medical College Hospital (PYMCH, Figure 2), Kim Man Yu Hospital (KMYH), and Pyongyang City Hospital One (PCH1). Each provincial hospital has approximately 10 neurosurgeons on staff. In remote areas where neurosurgery is not available, general surgeons perform basic neurosurgery. Currently, three magnetic resonance

imaging (MRI) scanners and seven computed tomography (CT) scanners are in Pyongyang. With the possible exception of some hospitals in the Special Economic Zone City of Rason located at the border with China, the hospitals outside Pyongyang do not have CT or MRI. Although the Pyongyang hospitals are equipped with angiographic suites, C-arms, operating microscopes, craniotomy sets, and spine sets, difficulties in finding

parts and adequate repair expertise result in much of equipment being frequently inoperative.

The PYMCH is the primary teaching facility for neurosurgery and the school is considered the best in DPRK. The KMYH and PRCH also train neurosurgeons (5). The trainees essentially work in an apprenticeship environment. They have the option of taking a test every 3 years to be certified in a system with seven levels. Upon entering training, they are automatically at level 7. After a minimum of 3 years they may take a test administered by the Ministry of Public Health to move up to the next level. It typically takes around 12 years before reaching level 3, at which point the neurosurgeon is allowed to work independently. Level 3 would be equivalent to the consultant status in the United Kingdom or board-certified status in the United States.

There are two female neurosurgeons in DPRK, one is currently working at a provincial hospital and one is a trainee at the PYMCH.

The scope of neurosurgical services covers a wide range. In addition to the routine head trauma cases, surgery for spine trauma is on the rise. Spine fixation surgeries with cervical plating, posterior cervical instrumentation, wiring, and pedicle screws are performed routinely. The steady supply of the implants continues to be a major hurdle. It should be noted that a significant portion of the spine trauma cases are delayed deformity cases. Benign brain tumors are excised routinely with the aid of an operating microscope, high-speed drills, and bipolar coagulation. Endoscopic third ventriculostomy is being performed at both PYMCH and PRCH with good results. At the PRCH, cases using a stereotactic frame reportedly have been performed. Ruptured aneurysms are treated exclusively by clipping as coiling is nonexistent.

RECENT INTERNATIONAL ACTIVITIES OF KNS (DPRK)

Through various channels, DPRK sends neurosurgeons to train abroad. Some of the host institutions are Charité Hospital of Berlin, Germany through a program

Table 1. Meetings of Korean Neurosurgical Society (DPRK)

Year	Participant Number	Paper Submission	Officers
1979	10	7	President: Il Ro Choi
1988	14	12	"
1990	18	18	"
1992	28	22	"
1994	45	21	Secretary: Young Han Roh
1996	48	32	"
1997	42	36	"
1998	82	62	"
2000	88	68	President: Young Han Roh
2003	102	88	"
2006	122	98	"
2007	250	38	"
2009	108	14 International/17 North Korean*	"
2010	84	82	"
2011	N/A	66	"
2012	104	89	"
2013	N/A	No meeting	

*Concurrent meeting with the WFNS Educational Course.

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