Available online at www.sciencedirect.com

SCIENCE DIRECT®

Surgical Neurology 64 (2005) S2:115–S2:122

SURGICAL NEUROLOGY

www.surgicalneurology-online.com

History of neurosurgery and neurosurgical applications in Turkey

Sait Naderi, MD[a,*], Aykut Erbengi, MD[b]

[a]*Department of Neurosurgery, Yeditepe University, School of Medicine, Istanbul 34752, Turkey*
[b]*Professor of Neurosurgery, Ankara, Turkey*

Abstract Although there is evidence of applications of cranial surgery in ancient times, it is commonly accepted that modern surgery started in the late 19th century. The advancements in anesthesiology and aseptic techniques were the main factors contributing to this process. Surgery of the nervous system, however, has a relatively shorter history than surgery of other systems. The process of surgical development in Turkey did not differ from most Western countries. Modern surgery started in 1890 in Turkey. In the beginning, neurosurgical applications were performed by general surgeons. Most of these applications included procedures for craniocerebral traumas and infections and procedures for pain relief. The first neurosurgeon, Dr Tuner, started working in 1923, operating in some spinal cord and brain tumor and trigeminal neuralgia cases. Other neurosurgeons, Dr Dilek, Dr Baydur, and Dr Kankat, were trained in France and started to work in the mid 1930s. The first neurosurgery department was established in Istanbul in 1923, and the first neurosurgery training program started in the late 1940s. Today, there are more than 50 neurosurgery training centers and more than 500 neurosurgeons in Turkey. There is an increasing number of publications by Turkish neurosurgeons, contributing to the total body of literature in neurosurgery. The current state of neurosurgery in Turkey is parallel to that of the advanced Western countries.

Keywords: History; Neurosurgery; Turkey

1. Introduction

The contemporary Republic of Turkey is located at the junction of Europe and Asia. Anatolia, the Asian part of Turkey (also known as Asia Minor), is one of the oldest parts of the world, which humankind either selected as a home or crossed on the way to the west (Europe), the east (Asia), and the south (Middle East and Africa). Anatolia was the main theater of countless immigrations, invasions, and occupations from the prehistoric ages to even the present day. This led to a concentration of influences of a variety of civilizations and cultures. Thus, all the civilizations in and around Anatolia influenced the formation of medicine and surgery in the premodern era.

The modern era of surgery started in the 19th century. The developments in modern anesthesiology and the use of antisepsis and asepsis techniques were among the main factors contributing to this process. Although this process had more important impacts on the development of some surgical disciplines, its impact remained relatively limited in neurological surgery. Therefore, surgery of the nervous system has a relatively shorter history than the surgery for other systems. This is, in part, because of the complex aspect of this discipline and the unique feature of the development of medical sciences in different countries.

Neurosurgery in Turkey started in the first half of the 20th century. However, the earlier application of neurosurgical techniques was started in the late 19th century by general surgeons. Further neurosurgical applications were also performed by general surgeons and ear, nose, and throat surgeons of the first half of the 20th century, even after formation of a neurosurgical organization [2,3,5,6,8,11-15,17,18]. On the other hand, a review of literature reveals some reports of neurosurgical applications before the modern era [4,7,10].

The aim of this study was to review the history of neurosurgery and neurosurgical applications in Turkey. However, because understanding the history of neurosurgery

* Corresponding author. Fax: +90 216 469 37 96.
E-mail address: snaderi@yeditepe.edu.tr (S. Naderi).

0090-3019/$ – see front matter © 2005 Elsevier Inc. All rights reserved.
doi:10.1016/j.surneu.2005.07.062

in Turkey requires a knowledge regarding the history of Turkey, a brief review of the previous and latter civilizations of this geographic region will be given.

2. Brief history of Turkey and other Anatolian civilizations

The Republic of Turkey was established in 1923. It can be accepted as the natural continuation of the previous civilizations established in the same or even larger geographic areas, including Seljuks (AD 1071-1300) and Ottoman empires (AD 1299-1923). On the other hand, there were many civilizations before the Seljuks and after Neolithic, Bronze, and Iron ages in Anatolia, including Hatti civilization (2500-2000 BC); Troy-II settlement (2500-2000 BC); Hatti and Hittite principalities period (2000-1750 BC); Great Hittite Kingdom (1750-1200 BC); Hurri civilization to Troy-VI civilization (1800-1275 BC); Aegean migration and invasion from Balkans (1200 BC); the Anatolian principalities during the Iron Age (1200-700 BC); Urartu civilization (900-600 BC); the civilization of Phrygia (750-300 BC); Lydia, Caria, and Lycia civilizations (700-300 BC); Ion civilization (1050-300 BC); Persian conquest (545-333 BC); Hellenistic and Roman ages (333 BC-AD 395); and the Byzantine civilization (AD 330-1453) [1].

The aforementioned historical background has been the main contributing factor connecting the past and the present.

3. Neurosurgical applications before Seljuks and Ottomans

There is evidence of the practice of surgery and trepanation in Anatolia since the Neolithic Age. Most of these cases dated to Bronze and Iron ages. The skulls were trepanned in more than 35 cases using 4 main techniques, including curettage, grooving, cutting, and drilling. There was evidence of healing in 19 of these cases, suggesting survival of the individuals after trepanation (Fig. 1).

One of most important examples of cranial surgery throughout the world is the discovered skull of a person who underwent craniotomy in the Urartu Age (800 BC) in Dilkaya-Van in eastern Anatolia [6]. The surgical technique used in this person seems highly developed, very similar to that used today. A free flap craniotomy was performed about 11 × 6 cm in diameter. Several small holes were connected probably with a fine chisel. Apparently, the bone flap was replaced after the procedure because both the cranium and bone flap were found together in the same grave during excavation (Fig. 2). Paleopathologically macroscopic and microscopic examination findings along the craniotomy edges suggested that this person survived after the procedure for several weeks. Another interesting finding in this cranium was the presence of a long linear fracture–looking fissure traveling from the frontal to the occipital bone. The fracture line crossed more than one branch of the middle meningeal artery. Speculation can be made about the possibility of a surgically evacuated epidural hematoma through the craniotomy. Evidence of survival after this procedure strengthens the possibility of curative surgery [6,7].

Fig. 1. The appearance of trepanation (with permission of *Turkish Journal of Neurosurgery*).

On the other hand, there are reports of the use of cauterization in the treatment of hydrocephalus, epilepsy, sciatica, and low back pain. In addition, the use of a reduction device to reduce spinal dislocations was recorded by physicians of ancient times in Anatolia. The medical doctrines of the Greco-Romans and the Syrians were transferred to Arabic by the translation of the classic treatises. This helped to prevent loss of the classics in the Dark Ages. The translation of the ancient classics was the most important factor contributing to scientific progression in the Islamic countries during the Dark Ages. After the Dark Ages, the classics were translated again into Latin.

4. Seljuks Empire

Anatolian Seljuks were the continuation of the Great Seljuks Empire. Both Seljuks and Ottomans used Islamic medical doctrines derived basically from Greco-Roman and Islamic scientists such as Hippocrates, Galen, Paulus of Aeginata, Avicenna, Rhases, and Al-Zahrawi. There is not enough data regarding the practice of surgery during the Seljuks Empire. However, it is of note that the Gevher Nesibe Hospital of Kayseri was one of the first organized hospitals in the world. Its department of psychiatry was one of the contemporary and frontier centers on neuropsychiatry (Fig. 3). There were also many hospitals in different Seljuks Empire cities (eg, Edirne, Çankırı, Kastamonu, and Amasya) in which physicians trained students, using the traditional master-apprentice system [20,21].

It is of importance to state that the snake was the symbol of medicine in Seljuks Hospital. The Çankırı Hospital's symbol was 2 snakes interwoven, and the Kastamonu