*Greetings
from
Abroad*

3rd
report

Spine Surgery in Turkey

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This manuscript aims to describe the historical development of the spine surgery in Turkey and will give a general overview of the current state.

History of Spine Surgery in Turkey

Surgery as a separate discipline was evolved in late 19th century. This was a natural evolution occurring after emergence of techniques for antisepsis and asepsis, techniques for anesthesia, and emergence of patient care which was born in Istanbul after of Florence Nightingale during the war between England and Ottoman empire versus Russia.

The emergence of general surgery provided opportunity to operate many surgical pathologies including spine related pathologies. This process was first conducted by general surgeons in late 19th and early 20th century in the world.

The history of spine surgery in Turkey has also started by activities of general surgeons. It can be stated that the spine related activities of general surgeons were continued between 1897 and early 1960's. Orthopedic and neurological surgeons have operated isolated cases since 1920's.

The history of modern surgery in Turkey can be started with surgical procedures performed by Professor Cemil Topuzlu (1866-1958), a general surgeon who returned after a general surgery training in France in late 19th century to Turkey (Fig. 1)¹⁾. Dr. Topuzlu performed first laminectomy in a case of spinal tuberculosis (Laminectomie pour mal de pott)¹⁾.

Another general surgeon, Professor Mim Kemal Öke (1884-1955) was a second generation general surgeon in Turkey. Along with many laminectomy procedures, he per-

Dr. Mehmet Zileli

formed first spine fusion in 1925 (mal de pott traite par l'operation d'Albee)^{2,3)}. The realization of the first spine fusion operation just 14 years after its definition by Albee reflects the level of science in the Ottoman Empire and the young Republic of Turkey in early 20th century.

In 1923 Dr. Abdulkadir Cahit Tuner (1892-1980), first Turkish neurosurgeon, returned from Germany. He operated first spinal tumors between 1923-1927 in Istanbul.

Another important event during the first half of 20th century is definition of congenital spinal stenosis by a Turkish orthopaedic surgeon, Professor Münir A. Sarpyener who published his paper in the Journal of Bone and Joint Surgery in 1945⁴⁾. It is of note that his paper was published before the paper of Verbiest which was published in 1954 (Fig. 2, 3)^{2,5,6)}.

First lumbar disc surgery was performed in 1948 by a

Fig. 1 Dr. Cemil Topuzlu
The founder of modern surgery in Tur-key.

Fig. 2 Dr. Münir Sarpyener
He described the congenital spinal stenosis in 1945.

CONGENITAL STRICTURE OF THE SPINAL CANAL*

BY PROF. DR. MÜNİR AHMED SARPYENER, ISTANBUL, TURKEY

From The Clinic of Infantile and Orthopaedic Surgery, Istanbul

It is a common phase of pathology that peripheral nerves are very susceptible to pressure, whether this be the sudden pressure of a fractured bone fragment, the gradual pressure of exuberant callus, or the slow envelopment of scar tissue. The nerve gives evidence of the pressure by sensory and motor changes in the part supplied, varying from muscle weakness to complete paralysis, from mild hypaesthesia to complete anaesthesia. Despite this well-known fact, we have thus far largely neglected the study of the congenital causes of pressure against one of the most important parts of the nervous system,—the spinal cord. I refer particularly to the congenital stricture of the spinal canal.

Fig. 3 First page of paper of Dr. Sarpyener published in Journal of Bone and Joint Surgery

Fig. 4 Dr. Hami Dilek
A neurosurgeon, performed the first lumbar disc surgery in 1948.

Fig. 5 Dr. Nurhan Avman
A neurosurgeon, performed the first anterior cervical discectomy together with Dr. Cloward in 1964.

Fig. 6 Prof. Dr. Güngör Sami Çakırgil

neurosurgeon, Dr. Hami Dilek (1898-1985) (Fig. 4). In the following years first series of lumbar discectomy were published by Dr. Taptas and Dr. Dilek^{7,8)}.

First cervical discectomy was performed in 1964 by Dr. Cloward-during his visit to Ankara- and Turkish neurosurgeon Professor Nurhan Avman (1928-1988) (Fig. 5)⁷⁾.

First Harrington operation was performed in 1968 by Professor Güngör Sami Çakırgil (1926-1989), an orthopaedic surgeon from Ankara University (Fig. 6)²⁾.

Following those names, many spine surgery procedures

were performed in 1970's, 1980's and 1990's by neuro and orthopaedic spine surgeons. General surgeons have been the pioneer for laminectomies for spinal trauma and tuberculosis, as well as spinal fusion (Albee's). The pioneers for thoracolumbar instrumentation were orthopaedic surgeons, while the pioneers for discectomy and cervical fixation techniques were neurosurgeons.

After 1980s, US and Europe based spine surgeons have trained some surgeons from Turkey and greatly contributed to the improvement of this specialty (Fig. 7).

Fig. 7

Photo showing presentation of the Honorary Membership certificate of Turkish Neurosurgical Society to Edward C. Benzel, Cleveland, USA in 2007 by Mehmet Zileli, President of the Society at that year.

Organizations of Spine Surgery in Turkey

There are mainly three organizations in the field of spine surgery in Turkey : Turkish spine Society, Spine and Peripheral Nerve Surgery Section of the Turkish Neurosurgical Society and AO Spine Turkey.

a) Turkish Spine Society : Orthopaedic surgeons in Turkey have established the “Turkish Spine Society” in 1990 under the leadership of Professor Emin Alici. Turkish Spine Society has organized spine congresses with international participation every two years, and the 8th meeting was organized in 2008. There are also spine courses organized by the society. Turkish Spine Society has more than 100 members, and the web site is <http://www.turkomurga.org.tr/>. The publication of the Turkish Spine Society is called “Journal of Turkish Spine Surgery”. There are also books published by the society.

“Turkish Spine Society” was an orthopaedic surgeons society at the beginning and for many years. They, however, have opened its door to neurosurgeons recently. We have to admit that there is an insufficient communication and coordination between neurosurgeons and orthopaedic surgeons.

b) Spine and Peripheral Nerve Surgery Section of Turkish Neurosurgical Society : Another spine surgery organization is Spine and Peripheral Nerve Surgery Sec-

tion of the Turkish Neurosurgical Society, which was founded by Professor Mehmet Zileli and Professor Fahir Ozer in 1995 <http://spinetr.org/>. Its mission has been education, training of spine surgery, and coordination among neuro-spine surgeons. This section has more than 150 active members. It organizes annual symposiums with participation of more than 400 surgeons. The section also organizes 3 local meetings, a “Summer School of Spine Surgery” for residents and young neurosurgeons, and an “Advanced Spine Course”.

Annual symposia of the section in every October gathers 350-400 participants. The first symposia was arranged in Izmir in 1997 on the topic of “Cervical Trauma”. Then, till 2009 a total of 13 symposia were organized with different topics.

The spine section has a quarterly bulletin, and publishes many books on different spine related pathologies, including lumbar degenerative disc disease^{9,10}), spine and spinal cord injuries⁵), spine tumors¹¹), spinal infections¹²), spine fusion¹³), spine biomechanics¹²), peripheral nerve surgery¹⁴) and spinal instrumentation¹⁵). The studies of this section have in general increased the interest to complex spine surgery among neurosurgeons¹⁶⁻²⁰).

c) AO Spine Turkey : AO Spine Turkey is another spine related organization founded in Turkey and many orthopaedic and neurologic spine surgeons work together.

Publications

Overall contributions of Turkish spine surgeons to global spine medicine have increased during the last decades. **Table 1** summarizes the number of publications in main spine related journals of which the authors are from Turkey.

Turkey has been the most productive in “Journal of Neurosurgery : Spine” (3rd level), and in “Spinal Cord” (5th level). The number of spine papers in “Spine” and “Journal of Spinal Disorders & Spine” are also increasing. Also congress presentations have significantly increased.

There are mainly two spine related journals in Turkey. One of them is the official organ of the Turkish Spine Society “**Journal of Turkish Spine Surgery**”. www.jtss.org/giris_en.php. The other one is the Journal “**Turkish Neurosurgery**” www.turkishneurosurgery.org.tr. “Turkish Neurosurgery” is published since 1994, four issues a year. It has cited in PubMed since 2007, and SCI-E since 2008. Also the quarterly “**Bulletin**” of Spine and Peripheral Nerve Surgery Section of Turkish Neurosurgical Society

Table 1 General overview of the papers published from Turkey in main spine-related journals between 2000-2009

	Spine	The Spine Journal	J Spinal Disord Tech	European Spine J	J Neurosurg Spine	Neurosurgery	Spinal Cord	Total
2000	8				12	3		23
2001	12		4		10			26
2002	10	1	4		8	2		25
2003	13		1		15	6	5	40
2004	22	1	3	4	18	1	9	58
2005	12		6	8	16	3	7	52
2006	9	3	7	17	11	5	5	57
2007	14	13	4	17	16	3	6	73
2008	13	5	7	15	12	6	3	61
2009	19	8	4	15	10	4	8	68

contains scientific manuscripts, discussion corner, reports from meetings, congress agenda and surveys among neurosurgeons. It has 45 issues so far.

A multiauthor book with two volumes "Spine and Spinal Cord Surgery" that was edited by Dr. Zileli & Dr. Özer was first published in 1997 in Turkish language¹⁹⁾. Second edition was in 2002²⁰⁾, and the third edition is about to be published. This book has gathered basic and clinical scientists in Turkey who have deeply involved in spine and has been a milieu for cooperation between different disciplines.

Implant companies

Today all spine instrumentation procedures are performed in Turkey. In addition to international companies, there are many national companies producing spinal implants. Companies may apply for approval of their implants to Social Security Institution (SSI) which covers most of the employees in Turkey. However, they do not need an approval of Turkish Standards Institute which is not able to perform tests for implants. For that reason, a CE mark of any implant has been sufficient for SSI application.

Test laboratories are not well developed, and in only a few universities are available: Middle East Technical University in Ankara and Istanbul Technical University biomechanical laboratories.

Many companies work in the field of production of implants for spine surgery. Currently, Alici, Tıpsan, TST, Tasarım, and Aktif are the major companies producing spine implants. Alici anterior and posterior thoracolumbar fixation system was first developed by Dr. Emin Alici in

1991, Tıpsan anterior and posterior thoracolumbar and cervical fixation systems were developed by Dr. Mehmet Zileli in 1996, İbn-i Sina anterior and posterior thoracolumbar fixation system was developed by Dr. Tarık Yazar in 1998, Türkmen thoracolumbar intercorporeal device was developed by Dr. Cengiz Türkmen in 1997.

Some high tech implants such as disc prosthesis and biomaterials (e. g., allografts, DBM) are imported.

Surgical Statistics

The number of complex spinal operations have increased during the last decades. Statistics show that approximately 70-80% of spine surgery is performed by neuro and 20-30% by ortho-spine surgeons. In a limited survey containing 29 academic health centers in 2001, the number of neurological and orthopaedic spine procedures in Turkey is as follows: Spine surgery procedures constitute 4.8% of surgical procedures among orthopaedic surgeons (1,849 of 38,193 procedures) and 69.4% of surgical procedures among neurologic surgeons (8,565 of 12,298 procedures).

Other than this, the lack of malpractice law causes over-indication among some surgeons.

Patient Expectations and Beliefs

The lack of government regulation for malpractice has been an issue to be solved. Although public physicians may partially play a role in health care, it is not very pronounced as in some Asian countries. Also the religious beliefs do not commonly affect the practice. Follow-up of the patients has been a problem for many years, however it has improved in recent years.

Burden for Spine Surgery Costs

The lack of health insurance covering whole population has been a problem for many years. However, approximately 80% of population has an official health insurance today. There are also some private insurances, but the amount is less than 1%. So a payment problem arises for almost 20% of people.

The progressive increase of costs of spine surgery and everyday introduction of new implants to the market are causing a burden for insurance companies. The government have decided to decrease the reimbursement of some surgeries and refused using some implants. There is however a big push from the companies to use new implants and this causes controversies and ethical discussions among surgeons.

Spine Research and Education

Although there is a big interest for biomechanical and other spine research among young surgeons, the insufficient number of grants for research is limiting the progress in the field of spine surgery. The lack of official spine surgery fellowship programs for academic health centers is another problem. Many academic surgeons have visited US or European centers in short or long term. There is also a lack of large multidisciplinary spine centers (neurosurgeon, orthopaedic surgeon, physiotherapist, etc)

Conclusions

Spine surgery has been performed in Turkey since 1897. All spinal procedures including instrumentation, endoscopic spine surgery, spinal arthroplasty, vertebroplasty and kyphoplasty are performed in Turkey. There are many implant systems manufactured in Turkey. In general, neurosurgeons have applied more spinal decompressions and cervical stabilization and orthopedic surgeons have applied more thoracolumbar stabilization.

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Comment

“Greetings from abroad” 連載にあたって(3)

総合南東北病院 水野順一

Dr. Mehmet ZILELI とは WFNS spine committee を通じて面識ができ，それ以来海外の学会で何度かお会いしている．現職はトルコのイズミールにある Ege University の脳神経外科教授であり，トルコ脊椎脊髓手術の第一人者と思われる．今回は多忙のなかトルコ脊椎外科の歴史と現状について詳細に記していただき，大変感謝している．詳しいことは本編を熟読していただければわかるので割愛するが，脳神経外科と整形外科の脊椎脊髓外科医がそれぞれに活躍している現状は，日本の状況とよく似ているものと感じられた．今後これを機に，日本とトルコとの交流が深まれることを希望する．