BIOGRAPHY

Martin Kirschner's Contributions to Surgery and Anesthesiology

Abstract
Martin Kirschner (1879-1942), versatile German surgeon who had his scientific research and academic interests addressed topics which are covered by several specialities such as general surgery, orthopaedic surgery, neurosurgery, anesthesiology and plastic surgery. He also was the editor of five medical journals and autjor of 249 articles and eight textbooks. His greatest and lasting contribution is the Kirschner 's wire which is still in use for bone traction and for temporal or definitive osteosynthesis.

Keywords: Martin Kirschner, Kirschner 's Wire, Skeletal Traction, Pulmonary Embolectomy, Development of Anesthesiology in Germany

Received: 1 Aug 2016; Accepted: 10 Sep 2016; Online published: 26 Oct 2016
Research on History of Medicine/2016 Nov; 5(4): 191-196.

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Introduction

The main objective of this paper is to perform a briefly review of Martin Kirschner 's contribution to a wide range of his scientific research and academic interests in many surgical fields such as general surgery, orthopaedic surgery, plastic

surgery, neurosurgery and also in anesthesiology.

Martin Kirschner was a successful editor and a prolific writer in medical journals. Kirschner's wire, his greatest and lasting contribution to orthopaedic surgery, still influences the daily practice of orthopedic surgeons. It is important to realize; however, that Martin Kirschner developed his wire technique exclusively for skeletal traction treatment.

Martin Kirschner's Medical Career

Martin Kirschner Kalbeck was born in Breslau, (today Wroclaw, Poland) on 28, October 1879, son of a German army officer Judge Martin Kirschner and Margarethe Kalbeck. His father later become Lord Mayor (Oberbürgermeister) of Berlin. When he was 14 years old, Martin Kirschner moved to Berlin. He gained admission to the medical school in Freiburg, Switzerland[1]. He later continued his education in Strasbourg (today in France). He finished his pre-clinical studies there with A-grades in all subjects, an exceptional achievement at the time. He continued his medical training in Strasbourg, Zurich and Munich before graduating at 25 in 1904 with his thesis on "Syringomelia and Tabes Dorsalis".

Kirschner began his career in general medicine in Berlin during 3 years with the internist Rudolf von Renvers, Director of the Division of Internal Medicine of the large Municipal General Hospital of Berlin but he was soon interested in surgery and started working with famous surgeon Edwin Payry Paul Leopold Friedrich in Greifswald in 1908. He moved to Koenigsberg (formerly in Prussia, now capital of Kaliningrad province of Russia) in October 1910, where he got accepted a residency in the surgical department at the University of Greifswald.

In 1913, he started work in Leipzig where outstanding surgeon Friedrich Trendelenburg was his surgery professor. Kirschner first practice war surgery was as director of a Red Cross expedition to Sofia and Adrianopel during 1912 and 1913.

Later, he was surgeon in the First World War during 1914 and 1915. Martin Kirschner then continued to work in Koenigsberg and was appointed as the head of the surgical department and professor of the University of Koenigsberg in 1916. There, he was involved in remodeling the university's outmoded surgical clinic, the first in a series of clinics he took pleasure in refurbishing[2].

Because of his great capacity for organizing, from 1927 to 1932 he was head of the department of surgery in Tübingen (Germany), supplied Georg Perhes, and also he was promot-

1- Fernández et al, 2007: 45-46.
2- Romm, 1983:104-107.

ed Professor of surgery at the University of Tübingen.

Martin Kirschner published several articles on wound healing and infections. After moving to Heidelberg, Martin Kirschner (Figure 1) was elected President of the German Society of Surgery in 1934. In Heidelberg, he was promoted to professor of surgery at the university of Heidelberg, and he also founded a hospital in that city. Martin Kirschner with Otto Nordmann published the six-volume presentation "The Surgery" (1926-1930).

Figure 1. Martin Kirschner (1879-1942); available from: https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9GcSzJKNp1-YACQgJlop2ahBnBa-LOKS1Q3F99BhpVDtZtZzuPgLklag

Kirschner participated as surgeon in the Second World War during 1939 until 1941. In 1942, Martin Kirschner suffered a gastric ulcer and he had an operation in which it was founded a malignant gastric cancer with liver metastases and local infiltration of the pancreas. Martin Kirschner died on 30 August 1942 aged 63 in Heildelberg, Germany. His second compilation, a "General and Special Surgical Operation Teaching" remained unfinished; it was continued by N. Guleke and R. Zenker after the Second World War.

He was an outstanding surgeon with numerous skills who did a versatile and successful medical career during 38 years. Kirschner was the editor of five medical journals, published 249 articles in medical journals and contributed to eight textbooks on almost every aspect of surgery and anesthesiology[3, 4].

3- Huber, 2008:89-92.
4- Schmitt, 1979: 1434-7.

Kirschner's Contributions to Several Surgical Specialties

One of his first academic interests was tissue defects and proving the versatility for autologous free fascia transfer. In the orthopedic surgery field in 1909, Kirschner made a great contribution to developing a thin pin (ranging from 0.7 to 1.5 mm in diameter) for bone traction later known as Kirschner's wire[5]. Martin Kirschner's lasting contribution to orthopedic surgery was developed as a modification of Steinmann's pin traction technique and Codivilla's pin traction technique (without entering their argument over priority). He realized that large pins produced significant soft tissue and bone damage as well as infection.

Accordingly, Kirschner referred to his modification as "wire extension," rather than "nail extension," the phrase used by Steinmann[6].

Kirschner developed a device which allowed him to insert his wire into fractured bones to be used as a traction anchor instead of the larger Steinmann pins. Further, Kirschner built on a means of putting the wires under tension to better align fracture fragments and to provide more stability in the thin wire, a principle that is still utilized today in circular external skeletal fixation[7].

It is important to realize, however that though Martin Kirschner developed the wire technique almost to perfection; he used it exclusively for skeletal traction treatment[8].

Among his contributions, the greatest and lasting contribution is the Kirschner's wire which is still in use for bone traction and also for temporary or definitive osteosynthesis for example in hand bone, foot bone, patella among others or for temporal support of other implants like plates or cannulated screws. He also built a surgical approach for the knee joint and an operation on the patella in 1911. He used fascia lata to repair tendons and tissue interposition application in joints. Martin Kirschner performed emergently and without anesthesia; the first successful pulmonary embolectomy in 1924 at Koenigsberg[4, 5].

In the neurosurgery, he modified the technique of craniotomy that was used at the time and contributed to his proposals for the treatment of cortical epilepsy.

After moving to Tübingen in 1927, Martin Kirschner published a paper titled "Essential Problems in Surgery" in which he discussed topics of surgery, emergency medicine and anesthesiology. He pointed to the basic concepts of emergency medicine and the transportation of severely wounded patients.

In general surgery field, Kirschner demonstrated that stom-

5- Meals et al, 2010:1682–1692.
6- Ibid.
7- Frassen et al, 2010:26-29.
8- Harasen, 2011:1025–1026.

ach could be mobilized without vascular compromise and could therefore be used for oesopaghoplasty. He developed a surgical technique for performing an anastomosis between esophagus and gastric fundus. His skill in general and vascular surgery contributed significantly to cancer surgery of the stomach, colon and rectum. In 1910, he modified the Bassini technique for inguinal hernia repair in order to reduce the recurrence. Martin Kirschner was the first to use autologous material namely pedicled or free fascia from the thigh to bridge the inguinal muscular defect[9].

Kirschner developed a surgical table for rectal surgery. He also did improvements in the surgical treatment of pylorospasm in infants. In plastic surgery, he modified the Langenbeck technique for cleft palate repair. Martin Kirschner also developed an air cushion cuff equipped with an air balloon used to obtain complete artificial bloodlessness in the extremities through constriction to be used during surgery.

In the gynecology, Martin Kirschner developed together with the gynecologist G.A. Wagner, a technique for vaginoplasty in 1930.

Martin Kirschner's Contributions to Anesthesiology

During Martin Kirschner's life, it was not recognized and there were not proper studies in anesthesiology specialty in Germany.

Kirschner understood the need of modern anesthetic techniques and monitor systems for further progress in all areas of surgery. His research enhanced our knowledge of the mode of action for various anaesthetic procedures and the prevention of iatrogenic complications.

He changed current techniques of anesthesiology in 1919, when Kirschner presented a technique for spinal anaesthesia, which it was individually adjustable in dosage and level of anaesthesia. He also developed another technique for high-pressure local anaesthesia in 1931. Kirschner introduced the concept to use a physician-aided rapid transportation system asking for a physician-controlled transportation of such high-risk-patients with the aid of aeroplanes, so that the emergency physician comes to the patient; this concept has become an integral part of emergency medical system nowadays[10]. Moreover, Kirschner insisted continuous control of vital parameters of such severely injured persons, best realized in an intensive-care unit.

He also founded mobile hospitals, and is a pioneer of trauma service and emergency medicine. Martin Kirschner introduced the percutaneous electrocoagulation of Ganglion Gas-

9- Van Hee, 2011:311.
10- Dick, 2006:319-321.

pari in order to temporally cure trigeminal neuralgia.

His concepts of perioperative of anxiolytic and sedative procedures for patients under local anesthesia are important. Kirschner also recommended to avoid the chronic contact with narcotics gas. His researches played a major role in the development of anesthesiology in Germany[11].

11- Goerig et al, 1992:233-242.

Discussion

Martin Kirschner was an outstanding surgeon and successful medical editor who published 249 articles and wrote eight textbooks; his contributions covered several medical specialites.

Many inventions and improvements Kirschner made have stood the test of time until today. Due to its improved characteristics, the Kirschner's wire has remained mostly unchanged in its design over many years, and it is a versatile tool in the orthopedic surgery field. On the other hand, Kirschner's researches have an important stance in the development of anesthesiology in Germany.

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