

Theodor Kocher (1841–1917) – A Surgical Maestro

Åke Andrén-Sandberg Gaby Mai

Department of Surgery Haukeland University Hospital Bergen, Norway

The name Theodor Kocher (fig. 1) is obviously known to surgeons working not only in his hometown Bern, Switzerland, but also in the rest of the world. Outside Bern, probably, his name today is usually connected to ‘the Kocher maneuver’, or to some instrument, rather than to the 1909 Nobel laureate.

Bern’s doctors and surgeons are proud of Theodor Kocher. There is a street and a park named after him and there are two statues of him set up in central positions in the city. Furthermore, he has been pictured on a postage stamp from 1967. It should also be mentioned as a curiosity that a grateful Russian patient named a volcano in Manchuria after him.

Professor of Surgery at 31 Years of Age

Theodor Kocher was born into a rich family from the area of Seeland outside Bern. After medical studies in Bern, and post-graduate study visits to London, Paris and Berlin, he became professor of surgery in Bern at the age of 31, in spite of the opposition of the medical clinic to the appointment [1]. He was best known at that time for his method, published in 1870, for reposition of luxated shoulders [2], but soon after his appointment he became renowned as a teacher, researcher and author, and received offers of good positions from many well-known universities. Nevertheless, he remained faithful to Bern for his entire 45-year career. Until 1884, Kocher carried out all of the surgical procedures at the hospital himself, but was then given a ‘Hilfsoperateur’ (assistant surgeon),

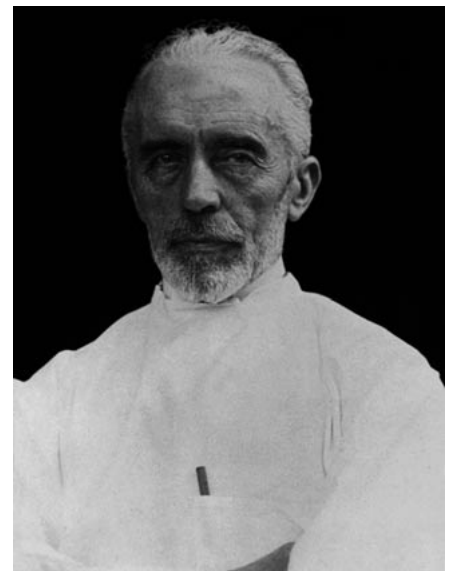


Fig. 1. The surgeon Theodor Kocher at about 50 years of age.

and the clinic grew so that by 1906 he had a staff of eight colleagues, the majority of which subsequently were responsible for surgical advances in the spirit of Kocher [3].

Kocher’s extensive correspondence with the leading American surgeons of that time, William Halsted and Harvey Cushing, has been saved [4]. He describes there numerous new experiments to verify his theories in a vari-

KARGER

Fax + 41 61 306 12 34
E-Mail karger@karger.ch
www.karger.com

© 2001 S. Karger AG, Basel
0253–4886/01/0184–0311\$17.50/0

Accessible online at:
www.karger.com/journals/dsu

Åke Andrén-Sandberg, MD, PhD
Department of Surgery
Haukeland University Hospital
N–5021 Bergen (Norway)

ety of fields of surgery: blood-saving methods, treatment of epilepsy, antiseptis, aspiration prophylaxis, chloroform narcosis, regional anesthesia, the use of intravenous salt solutions, etc. Written opinions show that he was a valued lecturer and that his 'Operationslehre' (operative textbooks) appeared in large and frequently re-published editions. In 1909, Kocher became the first surgeon to receive the Nobel Prize, awarded for his studies on thyroid goiter. He was still fully active in surgical practice and research when death summoned him in 1917.

Shoulder Research

Looked at from the point of view of Kocher himself, his research on the shoulder was of limited extent. His original description [1] was actually followed by eight further articles on the subject [2], but Kocher's most important contribution was that he based his reduction method on an exact anatomical and functional study of the shoulder joint, beautifully documented with very exact anatomical drawings and practical techniques (fig. 2).

Surgical Instruments

Kocher's name is associated in international surgical practice with a kind of forceps and a hook. A catalogue [3] from the firm M. Schaerer, trading from Bern and Brussels, shows many other instruments described as having been made according to his drawings: a craniometer, a chloroform mask, an ether mask, artery and bowel clamps, scissors, chisels, files, wound-hooks, and a series of instruments of uses which are difficult to imagine 80 years later. This bears witness to both the breadth of Kocher's surgical activities and of his technical interest.

Goiter Research

Goiter was a big medical problem in Bern and its Oberland environs until the iodination of salt became customary. This was one of the causes of Kocher's extensive thyroid research. He described the effects of partial and total thyroidectomy in 1883, and in a series of articles was later able to explain, on the basis of such operations, both increased and decreased function as well as normal function of the thyroid. He was awarded the Nobel Prize for the collected research results which even today make a nice progression: a relevant clinical problem, observation

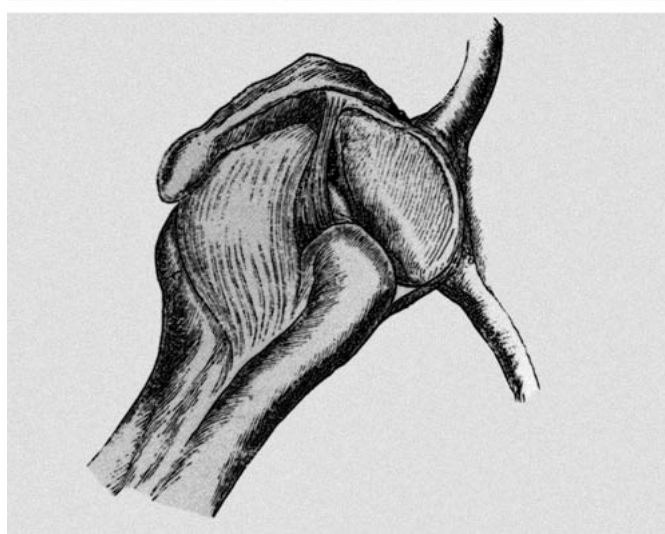
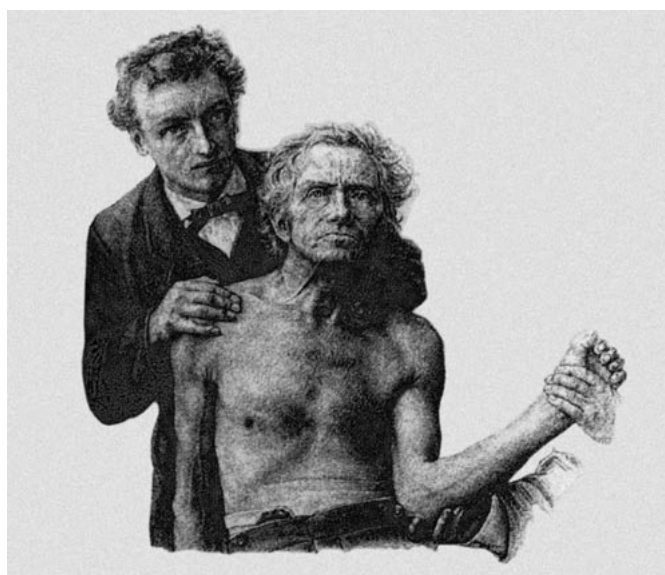


Fig. 2. Kocher's anatomical and functional illustrations of the shoulder joint [from ref. 7].

of patients, experimental studies, observation of the effects of different therapies, new experimental studies, etc.

Anesthesia

The problem of narcosis also took up a considerable part of Kocher's research efforts. His contribution was primarily the sequential chloroform-ether narcosis and the design of better masks for narcosis. He also introduced the preoperative preparation of patients who were to

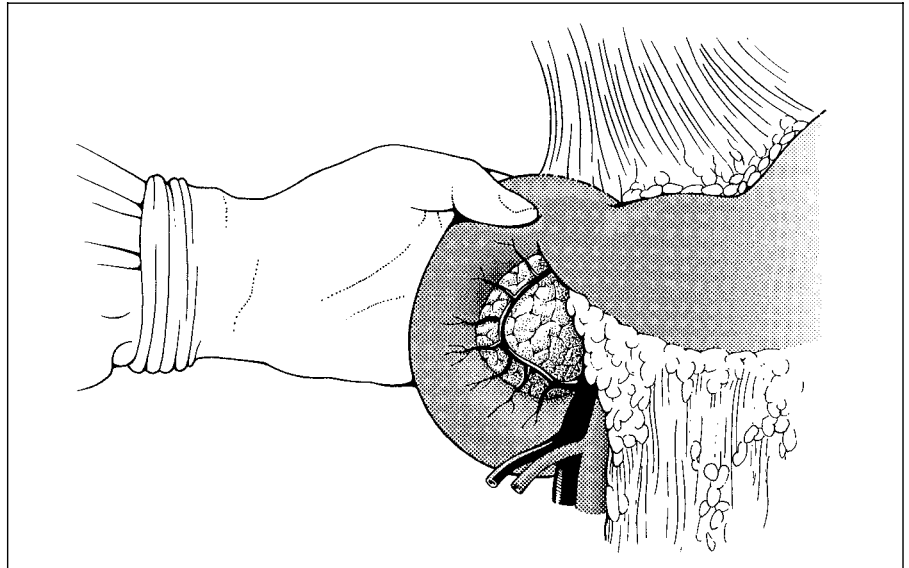


Fig. 3. Palpation of the pancreas head back side during dissection using Kocher's maneuver.

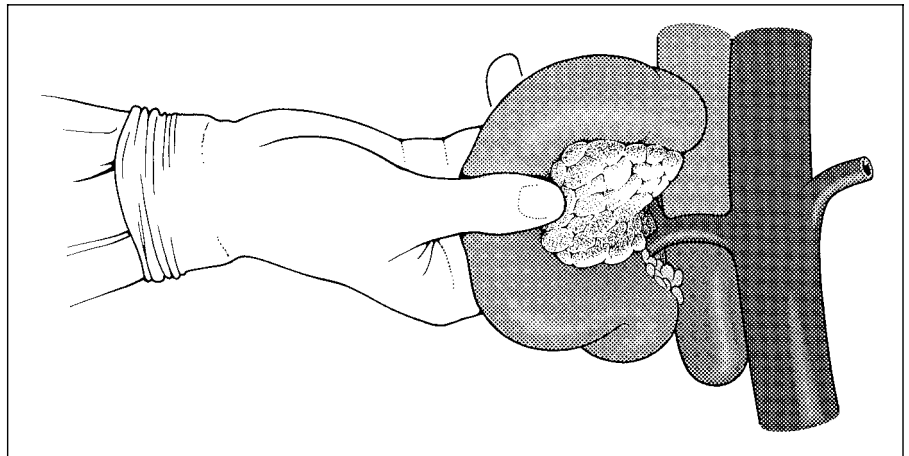


Fig. 4. The head of the pancreas fully mobilized after a Kocher's maneuver allowing uncovering of the vena cava inferior and the left kidney vein, and freeing of the aorta's right side.

be subjected to narcosis, in particular to avoid life-threatening aspiration of the gastric content. His intravenous use of salt solution for acute preoperative shock was also trailblazing [5].

Kocher's Maneuver

Surgical language today uses 'Kocher' or 'Kocher's maneuver' mainly to describe how the head of the pancreas may be mobilized and assessed during an operation. Kocher found out that the pancreas originates in that part of the duodenum's mesenterium which during embryogenesis turns to the right from an imagined midline of the body, which means that the entire blood supply to the duodenum comes from the head and body of the pan-

creas. This implies that there is a layer between the back side of the duodenum and pancreatic head and the retroperitoneum which does not contain any blood vessel of importance. It is thus possible, after separating the peritoneum along the duodenum's lateral edges, to dissect forward to the aorta and thereby feel and inspect the pancreas head from both front and back side (fig. 3, 4). This facilitates operations on periampullary forms of cancer, chronic pancreatitis, duodenal ulcer, and pancreas and duodenal trauma.

It is important, nevertheless, to point out that it is not correct to say that one has used a 'Kocher maneuver' if one has simply stuck a finger behind the duodenum. To call the intervention 'Kocher's maneuver' the whole second part of the duodenal has to be mobilized with the retroperitoneum bare for inspection all the way to the aorta.

The Man

His son Albert, then already an adult, complained in a letter about his father's 'work alcoholism': 'Papa does not get away from work, and in spite of that still manages to do only a third of what he ought to do.' Obviously Kocher worked almost all of his time, and a couple of days a year at a spa hotel with his family was all he allowed himself to rest. In spite of this, he was very bound to his family, and in a letter written to his wife a few weeks before his death he wrote: 'To me you are the dearest in the world' [6]. Kocher was described as being somewhat withdrawn and quiet, and always humble and interested in his fellow men [4].

Kocher's surgery was characterized by his contemporaries in terms like 'technical virtuosity' and 'innovative',

and he was thought to have loved to operate [4]. He was fortunate to be relatively healthy right up until his death. Just 4 days before his death from renal failure he performed his last operation on the victim of a serious accident – for which he was summoned because the ordinary surgeon had been called up to join the army (World War I).

Seen from a surgical point of view, Kocher will likely be remembered primarily for his scientific attitude to practical surgery and for his unusual ability to solve the medical problems that came his way.

Acknowledgement

Linda Francis for her skillful help with the translation.

References

- 1 Kocher T: Eine neue Reduktionsmethode für Schulterverrenkung. *Berl Klin Wochenz* 1870; 9:101–105.
- 2 Bonjour E: Theodor Kocher. Bern, Haupt, 1981, pp 1–136.
- 3 Boschung U: Theodor Kocher 1841–1917. Bern, Huber, 1991, pp 1–135.
- 4 Modlin IM: Surgical triumvirate of Theodor Kocher, Harvey Cushing and William Halsted. *World J Surg* 1998;22:103–111.
- 5 Kölliker C: Anästhesie und Notfallmedizin bei Theodor Kocher (1841–1917) unter seinen Berner Zeitgenossen; Diss, Medizinhistorisches Institut, 1992, pp 1–97.
- 6 Tröhler U: Der Nobelpreisträger Theodor Kocher 1841–1917. Auf dem Weg zur physiologischen Chirurgie. Basel, Birkhäuser, 1984, pp 192–197.
- 7 Kocher T: Über die Behandlung der veralteten Luxation im Schultergelenk. *Dtsch Z Chir* 1880;30:423–460.

Editorial Comment

Moshe Schein

Department of Surgery, New York Methodist Hospital, Brooklyn, N.Y., USA

The attempt by Professor Ådrén-Sandberg and Dr. Mai to abstract a colossal life – as Kocher's – into one thousand words is an unattainable task. A perspective about Kocher's huge standing in the history of modern surgery is provided by Fielding H. Garrison's classic 'History of Medicine' [1]. 'Just as Marions Sims and Billroth, in their specialists, advanced the clinical pathology of visceral disease, so we find Kocher, Horsley, von Eiselsberg, Halsted, Crile, Cushing, Carrel, Murphy, not only thinking physiologically in their work, but making many new departures by means of experimentation on animals. By common consent, the leader of this group was Theodor Kocher.' Readers who wish to read a more in-depth, albeit

succinct, account of Kocher's life are referred to the recent publication by Liebermann-Meffert [2].

The authors emphasize Kocher's 'discovery' of the so-called 'Kocher's maneuver', but was it really originated by Kocher himself? Professor David Dent from Cape Town drew my attention to the text on 'Operative Surgery' by Kocher, Adam & Black, London, 1911, where Kocher inserted a rather vague footnote: 'Mobilization of the duodenum is of more service than the method Langenbuch described in 1898, which consists of freeing the first part of the duodenum and in detaching the vertical part forward by dividing the peritoneum. It involves less injury and goes more directly to the mark.' Dr. Carlos Sardiñas



Fig. 1. Leslie H. Blumgart.

from Caracas, Venezuela, told me that an Argentinean book from 1961 (*Anatomía y Táctica Quirúrgica en la Cirugía Hepato-biliar*, edited by F. Loyudice et al.), calls the maneuver ‘Vautrin-Kocher maneuver’. Who exactly was Vautrin I could not figure out. Furthermore, according to the anonymous *Digestive Surgery’s* reviewer of this paper, it was Maurice Jourdan of France who in his 1895 thesis ‘Concerning choledochotomy’ proposed the utility of mobilizing the duodenum to expose the retroduodenal common bile duct.

According to Garrison [1], Kocher ‘maintained an absolutely aseptic technique and was a master of minute

Invited Editorial

L.H. Blumgart

Hepatobiliary Service, Memorial Sloan-Kettering Cancer Center, New York, N.Y., USA

In commenting on the historical sketch by Åke Andrén-Sandberg and Gaby Mai, I draw partly on my own experience at Inselspital in Bern but lean heavily on my contact with Fritz Leu, who was director of the hospital most of the time I spent in Bern, and on my contacts with Urs Boschung and Prof. Ulrich Tröhler and their excellent historical works on the man, his times, and his contribution [1, 2].

dissection’. In his address before the International Medical Congress in London in 1913, Harvey Cushing said: ‘The accurate and detailed methods in the use of which Kocher and Halsted were for so long the notable examples, have spread into all clinics – at least into those clinics where you or I would wish to entrust ourselves for operations. Observers no longer except to be thrilled in an operating room; the spectacular public performances of the past, no longer condoned, are replaced by the quiet, rather tedious procedures, which few beyond the operator, his assistants, and the immediate bystander can profitably see. The patient on the table, like the passenger in a car, runs greater risks if he have a loquacious driver, or one who takes close corners, exceeds the speed limit, or rides to admiration.’ Should we not be reading this quote to a few of our colleagues?

In the following pages, Professor Leslie H. Blumgart comments about this paper. Professor Blumgart (fig. 1) occupied Kocher’s Chair in Bern between 1986 and 1991. His bibliography includes 409 articles and 124 books and book chapters – including what is considered the current ‘bible’ in the field – ‘Surgery of the Liver and Biliary Tract’.

Only those who watched Les Blumgart operating on the liver can understand why some call him ‘The wizard’. Kocher would have certainly approved of his methods and technique!

References

- 1 Garrison HF: History of Medicine, ed 4. Philadelphia, Saunders, 1929.
- 2 Liebermann-Meffert DI: Short story of Theodor Kocher’s life and relationship to the International Society of Surgery. *World J Surg* 2000;24:2–9.

Andrén-Sandberg and Mai cover in compact fashion a great deal of ground concerning Kocher’s life. He was indeed only 31 years old when in 1872 he was made full professor of surgery at the still young university in Bern, but it was not long before his growing fame brought him offers of professorships and departmental chairs from Europe’s top universities. He remained, however, true to his home university and served for 45 years as Professor

and Clinical Director at the Inselspital. His lifelong achievement was based on the combination of mental acuity, intuition, and a strong work ethic. In 1909, for his research on goiter, he became the first surgeon to receive the Nobel Prize and he was fully active until he died on July 27, 1917.

At the time of his initial appointment, the clinic was located in the heart of old Bern in a building constructed in 1720, which in no way met the demands of modern surgery. He gave outstanding services in planning the construction of a new hospital and some of the buildings are still extant on the site where his bust now greets all visitors. One could not work in Inselspital or indeed in the city of Bern without being acutely aware of his pervading influence on the city and of course on the development of surgical science. His interests ranged, as mentioned by Andrén-Sandberg and Mai, from the design of instruments to anesthesia and, in particular, the scientific aspect of surgery. Indeed he was one of the leading figures in the post-Victorian era. He was the ideal person to build on the separate developments of general anesthesia by William Morton of Boston, Massachusetts and James Young Simpson in Edinburgh in 1846, the discovery of antiseptics by Joseph Lister in Glasgow in 1867 and on the control of bleeding by the use of self-retaining artery forceps by Spencer Wells in 1872. His endeavors to create a system of safe surgery on the basis of clinical observation, and anatomical and pathophysiological experimentation were perhaps his greatest achievement. He was a leading figure in the transition of surgery from the mechanical and the physical to the biochemical approach.

During my stay in Bern, I visited the home of Prof. Ulrich Tröhler at Zäziwil, a small village near Bern, which harbors the practice of the physician who had noticed that a patient, Marie Bichsel, aged 11 who had undergone an operation for thyroid disease on January 8, 1874 had changed her behavior and from a 'spirited and joyous creature' had become peevish and dull. Kocher subsequently followed up on this patient and immediately requested all his goiter patients to return for examination. This led to his appreciation of the deleterious effects of thyroid hormonal deprivation and ultimately to his win-

ning of the Nobel Prize. The village practice is still in Zäziwil and I am indebted to Prof. Tröhler for teaching me some of the history of this remarkable man. Recently in a personal communication, Prof. Tröhler told me a story regarding the great man. It appears that there is evidence that Kocher maintained a small suite with a fairly primitive operating room at the Bernerhof Hotel in Bern where he operated on exclusive private patients. He apparently operated on the father of a Polish aristocrat who had taken his father to Berlin in the first instance to see the famous Bergmann who had turned down the operation. Kocher operated on him for a rectal carcinoma in the Bernerhof Hotel in the rented suite and the operation was apparently very successful. There is no photographic evidence regarding this but written evidence indicates that the Polish nobleman was anxiously looking through the door of the room while Kocher operated on his father.

I now work in New York and it would be remiss not to comment on Kocher's influence on the American surgical scene, particularly on Harvey Cushing and William S. Halsted. These three enjoyed a lengthy comradeship. Halsted went to Bern in 1889 and was drawn to Kocher. This is not surprising. The latter's habit of studying surgical problems from the anatomic, pathologic and physiologic standpoint prior to applying surgical methods were virtually the same as Halsted's. Cushing arrived and worked in Bern on November 1, 1900. He worked very closely with Kocher and recorded many interesting details. The relationship between Kocher, Halsted and Cushing demonstrated not only a deep respect for each others talents but, in addition to their professional admiration, a strong personal feeling between them.

It was an extraordinary privilege to be a successor in the line of Theodor Kocher at Inselspital in Bern and to have worked in the environment, which the great man had initiated.

References

- 1 Boshung U: Theodor Kocher. Bern, Huber, 1991.
- 2 Tröhler U: Der Nobelpreisträger Theodor Kocher 1841–1917: Auf dem Weg zur physiologischen Chirurgie. Basel, Birkhäuser, 1984.