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## Surgical Leaders

# *Emil Theodor Kocher, M.D., and His Nobel Prize (1841–1917)*

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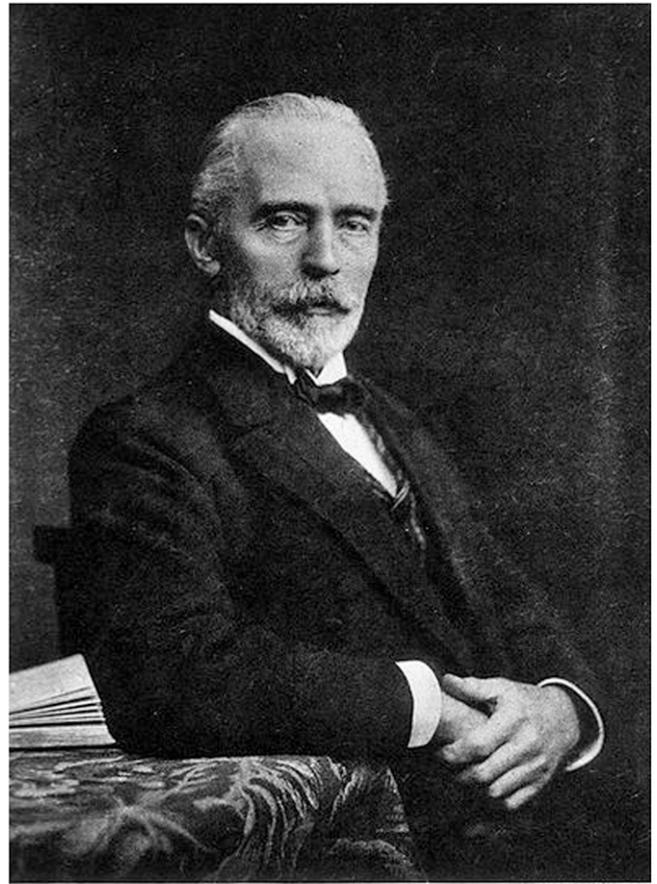
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**M**AJOR CONTRIBUTIONS TO the advancement of surgery occurred at the turn of the 20th century. Theodor Billroth was in the midst of revolutionizing abdominal surgery, whereas Louis Pasteur and Joseph Lister were making landmark strides in antisepsis, forever changing the foundations of surgical thinking. Undoubtedly, Theodor Kocher's (Fig. 1) exposure to these and other giants had a major influence on his career and contributed to his success and ascent as the first, and one of only 10, surgeons ever to be awarded the Nobel Prize in Medicine.<sup>1</sup>

Kocher was born on August 25, 1841, to Jacob Alexander and Maria Kocher in Bern, Switzerland. Before obtaining his medical degree, Kocher studied in Berlin, London, Paris, and Vienna. He would eventually graduate from medical school, *summa cum laude*, receiving his Doctor of Medicine degree from the University of Berne in 1869. After graduating, he traveled to Europe with intent to study under the great surgeons of his time: Paget, Hutchinson, and Lister from England as well as Pasteur and Verneuil from France. It was in part this exposure to Lister and Pasteur that influenced Kocher in focusing efforts on antisepsis. He then traveled to Berlin, where he trained under Theodor Billroth (1829–1894).<sup>2</sup> On returning to Switzerland in 1872 with a strong letter of reference from Billroth, Kocher was appointed professor of surgery at Berne University at just 31 years of age, a post he would hold onto until his death 45 years later.

Under his leadership, the Surgical Clinic in Berne was the first center to practice pure antiseptic treatment of wounds. Kocher collaborated with renowned bacteriologist, Ernest Tavel, whose seminal studies on infectious processes were in progress at the time. The acclaimed published product, *Vorlesungen über chirurgische Infektionskrankheiten* (Lectures on Surgical Infectious Diseases), went on through many editions

through the 19th century. Kocher also published experimental work on hemostasis, evolving a hydrodynamic theory for the effect of gunshot wounds and in 1912 attempted to accelerate hemostasis in internal hemorrhage by injecting a sterile coagulating fluid



*Emil Kocher*

FIG. 1. Emil Theodor Kocher, August 25, 1841, to July 27, 1917, Bern, Switzerland. Reproduced from Emil Theodor Kocher. Wikipedia, the free encyclopedia. Available at: [http://en.wikipedia.org/wiki/File:Emil\\_Theodor\\_Kocher.jpg](http://en.wikipedia.org/wiki/File:Emil_Theodor_Kocher.jpg). Accessed October 14, 2011.

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derived from platelets, which was developed by Anton Fonio (1889) at the surgical clinic.

As one of the brightest students in pathological anatomy and anatomic investigation, Kocher first gained recognition for pioneering work in the management of shoulder dislocation. The “Kocher method,” named in his honor, involves external rotation of the humeral head followed by an anterior lift past the glenoid rim, placing the dislocated shoulder back into position. To this day, the Kocher method remains the most widely accepted means for treating shoulder dislocation. Dr. Kocher was also one of the premier innovators of his time, devising the Kocher clamp, a strong clamp with serrated blades and interlocking teeth at the tips. It is used for grasping, manipulating, or extracting tissue or fascia and remains an essential surgical instrument even in the modern era. Among other surgical household terms bearing his name is the Kocher incision, a right subcostal incision used for open biliary surgery, as well as the Kocher maneuver, a technique used for the mobilization of the duodenum from its retroperitoneal location.

Theodor Kocher’s greatest contribution, however, was his extensive study and description of the physiology, pathology, and surgery of the thyroid gland. He was the first to excise the thyroid for goiter in 1876. In 1883, Kocher presented the outcomes of his first 100 thyroidectomies at the congress of the German Surgical Society. Of the 100 patients, 30 were observed to have complications, including weight gain, mental and speech slowing, hair loss, and abnormal heart rates as well as abnormal blood-related problems such as anemia and altered white blood cell counts. He noted that the patients experiencing these symptoms had undergone total thyroidectomy, whereas those who had only a portion of their thyroid gland removed experienced only transitory signs and symptoms of the pathological pattern. Kocher postulated that this spectrum of disease was attributed to the complete lack of thyroid hormone secretion. He proceeded to publish on the phenomenon of cretinism in patients with hypothyroidism, later termed Kocher-Debré-Semelaigne syndrome. Additionally, Kocher observed that hypothyroidism can not only be attributed to the surgical or rarely congenital absence of the thyroid gland, but also to the dysfunction of the gland in the setting of goiter. By 1912, Kocher had performed 2000 thyroidectomies, and by 1917 when he died, over 7000 thyroid excisions had been performed in the Surgical Clinic in Berne, of which more than three-fourths were by Kocher himself. His relentless pursuit of perfection and painstaking attention to detail in refining thyroid surgery decreased mortality from 14 per cent in 1884 to 0.18 per cent in 1898.<sup>3</sup>

It was Theodor Kocher’s pioneering work in the pathophysiology and surgery of the thyroid gland that eventually earned him the prestigious Nobel Prize in Physiology or Medicine in 1909.<sup>4</sup> Kocher’s observations paved the way for future treatment of thyroid disorders. Researchers continued his work, subsequently recognizing the importance of iodine and in 1914 successfully isolated the effective part of thyroid hormone, thyroxine. As iodine-scarce regions started incorporating supplements into their diet, the necessity for thyroid resections declined. Nevertheless, Kocher’s contributions to combating endemic goiter continue to be recognized in a world where 5 per cent of the population is still affected by this disorder.

Theodor Kocher died on July 27, 1917, at Berne. Relying on absolute precision and care, Kocher, along with Halsted and Lister, arguably ended the days when surgeons were judged on how quick and spectacular their cases were. The Theodor Kocher Institute in Kochergasse, Kocher Park, in part funded by the prize money he received from the Nobel Prize he received, and a bronze bust (Fig. 2) was established

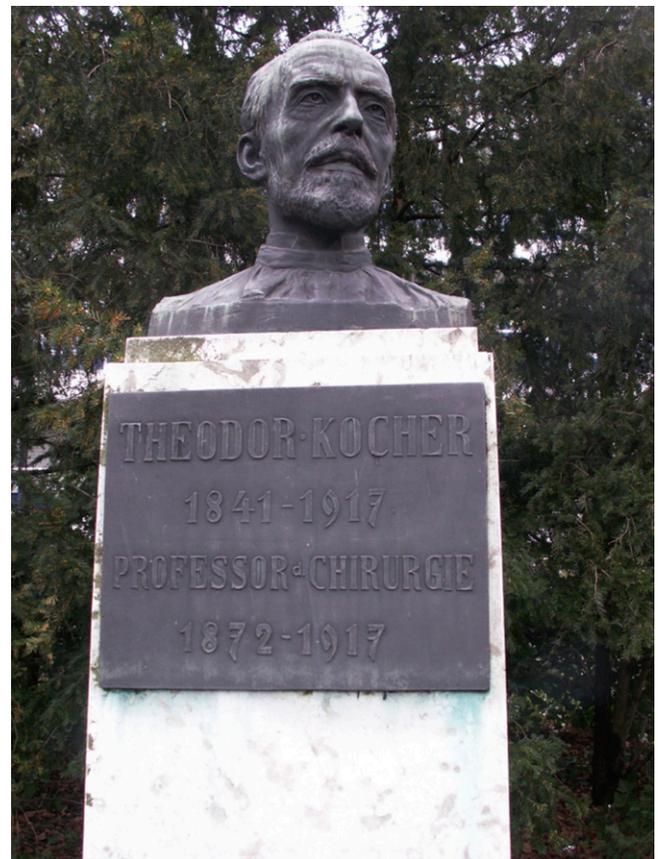


FIG. 2. Bronze bust of Emil Theodor Kocher outside the university hospital in Kocher Park. Reproduced from Platform Fur Kunst Kultur Und Gesellschaft, G26.ch. Available at: [www.g26.ch/bern\\_denkmal\\_theodor\\_kocher.html](http://www.g26.ch/bern_denkmal_theodor_kocher.html). Accessed October 14, 2011.

as a permanent memorial, immortalizing the hard work and contributions of Theodor Kocher in the city of Berne.<sup>5</sup>

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