

REVIEW

Jan Mikulicz-Radecki: one of the creators of world surgery

Wojciech Kielan, Bogdan Lazarkiewicz, Zygmunt Grzebieniak, Adam Skalski and Piotr Zukrowski

Second Department of General and Oncological Surgery, Wroclaw Medical University, Wroclaw, Poland

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Abstract. This paper presents the life and achievements of Professor Jan Mikulicz-Radecki and his contribution to European and world surgery. He was born in 1850. Four periods can be distinguished in his surgical career: (1) Vienna period, 1875–82, when he worked by the side of the great Theodor Billroth: he introduced a number of new diagnostic and operative techniques, aseptic and antiseptic procedures, published research papers. He made the first endoscope for examining the esophagus and stomach. (2) Cracow period, 1882–87, when he was head of the Department of Surgery: he inaugurated his work with a lecture in Polish, which started: Gentlemen, I have been accused that I do not know the Polish language – which is my mother tongue to me as well as to any of you. He published papers on the use of iodophorm for healing wounds, was the first surgeon who sutured a perforated gastric ulcer (1885) and invented pyloroplasty (1887), nowadays called Heinecke-Mikulicz pyloroplasty. (3) Königsberg period, 1887–90: he improved the technique of gastric resection, worked on surgery for peptic ulcer and advocated aseptic and antiseptic procedures. (4) Wroclaw (Breslau) period, 1890–1905: Mikulicz was appointed head of a newly founded Surgical Department. He rebuilt it and designed one of the largest and most modern operating theaters in Europe that time. He introduced silk gloves for operations for the first time in the world. In 1892 he described bilateral swelling of salivary and lacrimal glands, called Mikulicz's syndrome; in 1902 he published his experience with two-stage colon resection; and in 1904 he described ostitis fibrosa cystica juvenilis. Called “a king in the kingdom of surgeons”, he was one of the fathers of the world's modern surgery; having a brilliant surgical mind, he was a pioneer of many new operations and an inventor of surgical tools, permanently assimilated in the world's surgery. (Keio J Med 54 (1): 1–7, March 2005)

Key words: Mikulicz, history, surgery

Introduction

The intention of this paper is to present the life and achievements of Professor Jan Mikulicz-Radecki and his contribution to the world surgery. Some surgeons may associate his name with surgical forceps or some methods of operation but only a few know more details.

Jan Mikulicz-Radecki was born on May 16, 1850 in Czerniowce (Poland). His father was an architect, a Polish nobleman whose coat of arms was Gozdawa. His mother, Emilia Damnitz, was Austrian. Jan's brother was a general in the Austrian army, and their sister Emilia Zborowska settled in Myslenice near Cracow. Jan Mikulicz-Radecki studied medicine at the Faculty of Medicine of the University of Vienna.^{1–5} In his surgical career four periods can be distinguished according to the university centers where Mikulicz worked, ini-

tially as a surgical assistant, and later heading surgical departments.

Vienna Period of Mikulicz's Surgical Career

After completing his medical studies in 1875 he started working in Vienna. He chose the Surgical Department of Professor Theodor Billroth and worked with him from 1875 to 1882. Only two full-time assistants were employed at the department that time, along with twelve volunteers who worked to learn surgery. Theodor Billroth's Vienna surgical center was then a most valued one for its high clinical and research level. Numerous modern operating techniques were developed there at those times, along with microscopic and experimental studies.^{6,7} Billroth began to treat Mikulicz seriously not sooner than after half a year. As Bill-

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Reprint requests to: Professor Wojciech Kielan, MD, PhD, 2nd Department of General and Oncological Surgery, ul. Skłodowskiej-Curie 66, 50-369 Wroclaw, Poland, e-mail: chir2@chir2.am.wroc.pl

roth operated on a patient with rhinoscleroma, he gave Mikulicz the task of examining it under a microscope. The results of Mikulicz's examination changed the former views on the pathology of rhinoscleroma completely. Mikulicz proved it to be chronic inflammation, not a malignant tumor, and the giant cells found by him to be typical of this disease are now called Mikulicz's cells.⁸ After that discovery, in 1879 Mikulicz was sent by Billroth on a 5-month research tour round the outstanding surgical centres of Europe. The main purpose of this journey was visiting the leading surgical departments of Germany, France and England. There he met Richard Volkmann and Joseph Lister, and got acquainted with Lister's antiseptic ideas which appeared to him very much. Soon, in 1880 he presented his habilitation dissertation on *genu varum et valgum*.^{5,9,10}

But the greatest invention made by Mikulicz during his employment in Billroth's Department in Vienna was the construction of the first endoscope in the world, designed for examining the esophagus and the stomach (Fig. 1).^{1,11-14} Hilary Schramm, Mikulicz's disciple, wrote the following words about this event in 1881: After long efforts and numerous experiments carried out together with Leiter, Mikulicz has finally succeeded in making a gastroscope, with which he was afterwards able to see the inside of the stomach of a living man. Mikulicz expects that his new tool will possibly set a new direction in diagnosing diseases of the stomach.¹⁴ Mikulicz's gastroscope was a rigid metal tube, 65 cm long and 14 mm in diameter. It was slightly flexed, its middle and lower segments forming the angle of 150°. Inside the gastroscope there was an electric wire and two inner tubes, one for inflating the stomach with air, the other for water. In 1881 Mikulicz was the first one in the world to diagnose endoscopically cancer of the lower esophagus and esophageal narrowing due to its compression by an aneurysm of the descending aorta.^{1,11,12,14} He was also the first surgeon who observed that the results of surgical treatment of gastric cancer depend on its early diagnosis.^{1,15,16} In 1883 he published his remarks on this fact; he wrote: In fact in many cases cancer of the pylorus can be diagnosed beyond any doubt only when it can not be operated on any more. Therefore the future of the excision of the pylorus depends mainly on working out some method of early detection of gastric diseases. I hope that my gastroscope will also contribute to this, sooner or later.¹⁵ Mikulicz continued his endoscopic examinations in Cracow, Königsberg and Wrocław, convinced that it would bring new light to diagnosing diseases of the stomach and esophagus (Fig. 2).

When Mikulicz worked with Billroth, he also dealt with such problems as resection of the prolapsed large bowel, surgical treatment of tonsillar carcinoma, and

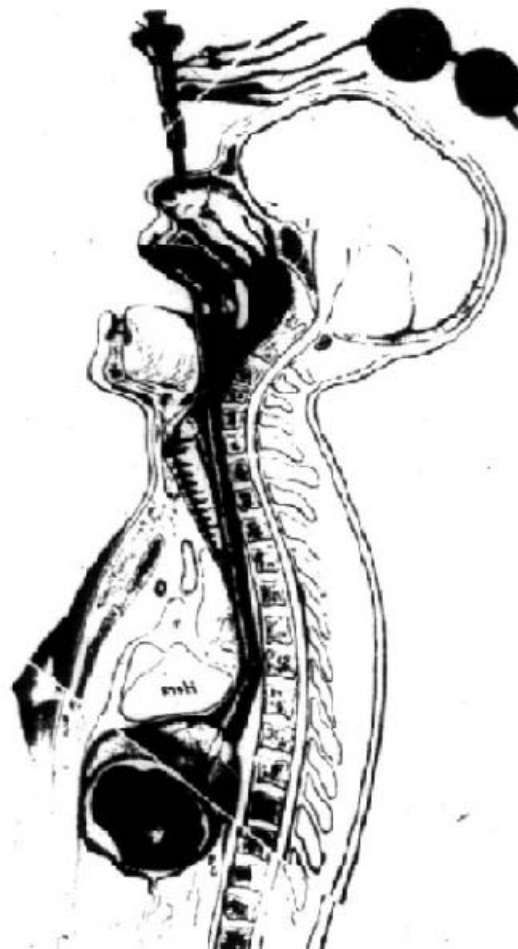


Fig. 1 A drawing depicting Mikulicz's endoscope (Reproduce from "Über Gastroskopie und Ösophagoskopie", Wiener medizinische Presse 1881, Bd. 22, S. 1441, after W. Kozuszek, "Jan Mikulicz Radecki, 1850–1905. A promoter of Modern Surgery", Wrocław University Publishing House, Wrocław 2003, fig. 23, Copyright © (2003), with permission from Professor Waldemar Kozuszek).

resection of the thyroid gland.¹ In 1880 Jan Mikulicz-Radecki married Henriette Pacher, who stayed by his side till the end of his life. According to the Austrian custom a married assistant could no longer be employed in a university department. Nevertheless, Billroth prolonged his contract for another year, which had been unprecedented for 25 years at the Faculty of Medicine in Vienna.⁵

Cracow Period of Mikulicz's Surgical Career

Leaving Vienna Mikulicz moved to Cracow where he was given the post of Professor and head of Department of Surgery at Jagiellonian University. In Cracow he worked in the years 1882–87, which accounted for the second important period in his life.^{16,17} He began with an inaugurating lecture, given in Polish on October

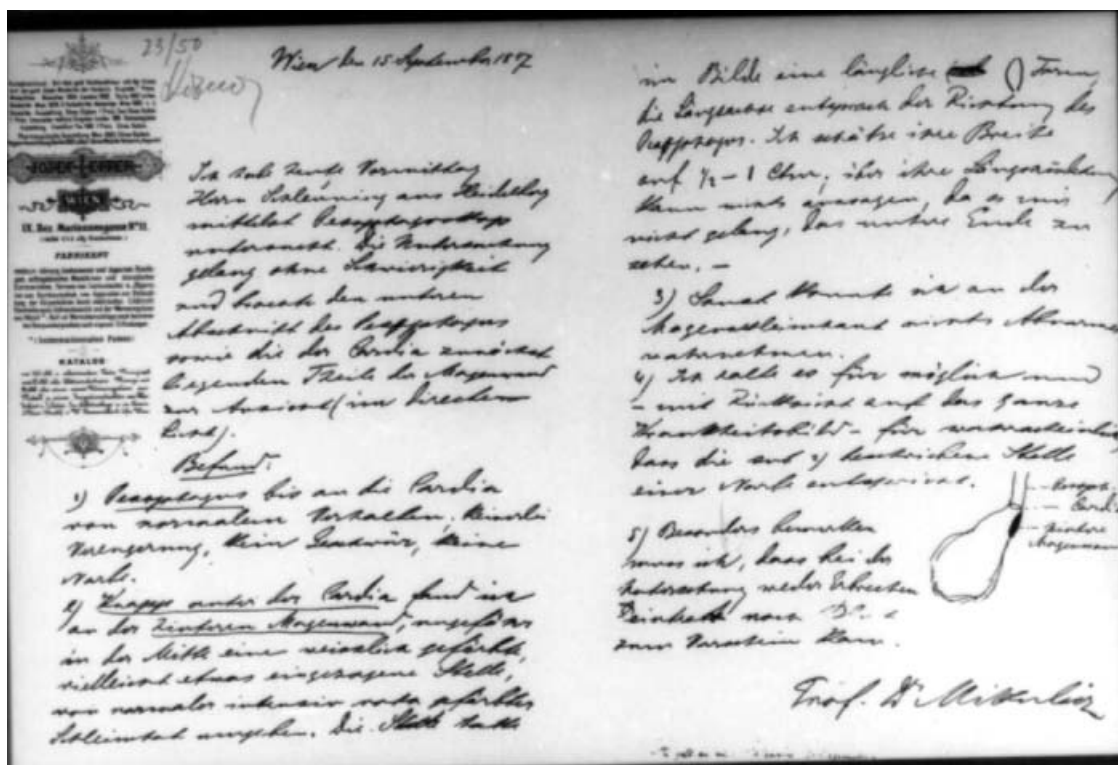


Fig. 2 A result of endoscopic examination of the esophagus and stomach, handwritten by Mikulicz in 1887 (Reproduce from the collection of professor Waldemar Kozuschek, after W. Kozuschek, "Jan Mikulicz Radecki, 1850-1905. A promoter of Modern Surgery", Wrocław University Publishing House, Wrocław 2003, fig. 26, Copyright © (2003), with permission from Professor Waldemar Kozuschek).

13, 1882, which was printed in the Polish Journal of Surgery (Przegląd Chirurgiczny). Here is one remarkable sentence from it: *Moi Panowie, zarzucano mi, że nie znam języka polskiego, który tak samo jest mowa ojczysta dla mnie, jak i dla każdego z Was. Prawda, że przez ciągle przebywanie w zakładach naukowych niemieckich, zaniedbałem naszej mowy.* (Gentlemen, I have been accused that I do not know the Polish language – which is my mother's language to me as well as to any of you. It is true, however, that due to continuous dwelling at German scientific institutions I have neglected our language.).^{17,18}

In spite of very poor housing conditions and having only 21 hospital beds, after introducing necessary adjustments in the operating room (the hitherto existing operating room served at the same time for dressing wounds, out-patients operations and lectures with corpse demonstrations) and improving the hygienical situation, he started performing operations never done in Cracow before, like thyroidectomy, gastric resection for cancer, transvaginal hysterectomy or osteoplastic foot amputation.^{5,16,19,20} In Mikulicz's times the Surgical Department in Cracow achieved a very high standard and was ranked among the best ones in the state. He was the first surgeon in the world who

sutured a perforated gastric ulcer (April 24, 1885) and invented pyloroplasty (February 13, 1887), called nowadays Heinecke-Mikulicz pyloroplasty (in the same year it was also published by Heinecke in Erlangen) (Fig. 3).^{5,16,21} His departure after 5 years was truly re-

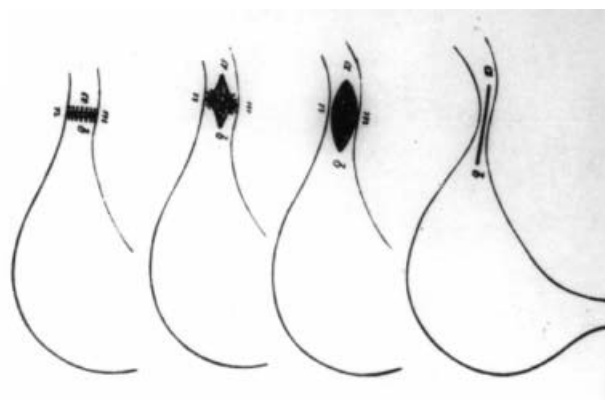


Fig. 3 Diagram of pyloroplasty by Mikulicz (Reproduce from "Zur operativen Behandlung des stenosierenden Magengeschwürs", Archiv für klinische Chirurgie 1888, Bd. 37, s. 79-82, after W. Kozuschek, "Jan Mikulicz Radecki, 1850-1905. A promoter of Modern Surgery", Wrocław University Publishing House, Wrocław 2003, fig. 34, Copyright © (2003), with permission from Professor Waldemar Kozuschek).



Fig. 4 Jan Mikulicz-Radecki and his disciples in Cracow (Reproduce from the collection of Department of History of Medicine, Jagiellonian University in Krakow, after W. Kozuszek, “Jan Mikulicz Radecki, 1850–1905. A promoter of Modern Surgery”, Wrocław University Publishing House, Wrocław 2003, fig. 37, Copyright © (2003), with permission from Professor Waldemar Kozuszek).

gretted. He earned the reputation of an excellent surgeon and researcher. He even became president of the Scientific Medical Society in Cracow. At the meetings of the Medical Society he read scientific lectures and presented his own interesting surgical cases (Fig. 4).

Königsberg Period of Mikulicz’s Surgical Career

In 1887 Mikulicz moved to Königsberg to hold the chair of the Surgical Department there until 1890. In Königsberg he worked mainly on abdominal surgery, further developing the techniques of gastric resection and surgical treatment of peptic ulcer. He also worked on introducing aseptic and antiseptic procedures to surgery. There he also made an observation on the symmetrical swelling of lacrimal and salivary glands known later as Mikulicz’s syndrome; he published this discovery later, in 1892.^{22,23}

Wrocław Period of Mikulicz’s Surgical Career

In 1890 Mikulicz was appointed head of the Surgical Department in Wrocław (in those times named Breslau). Thus began the longest period in his career and the last one, from 1890 to 1905. Moving to Wrocław was a turning point in Mikulicz’s life, with far-reaching consequences. When he took the post the building of the new department had not been finished yet. He had the opportunity to introduce changes and improvements of his own, first of all to rebuild the operating theater which he considered too small and outdated. In 1887 the new, aseptic operating theater was finished, being at the time the largest and most modern one in Europe.^{1,16,24–27} In this department the ideas changed

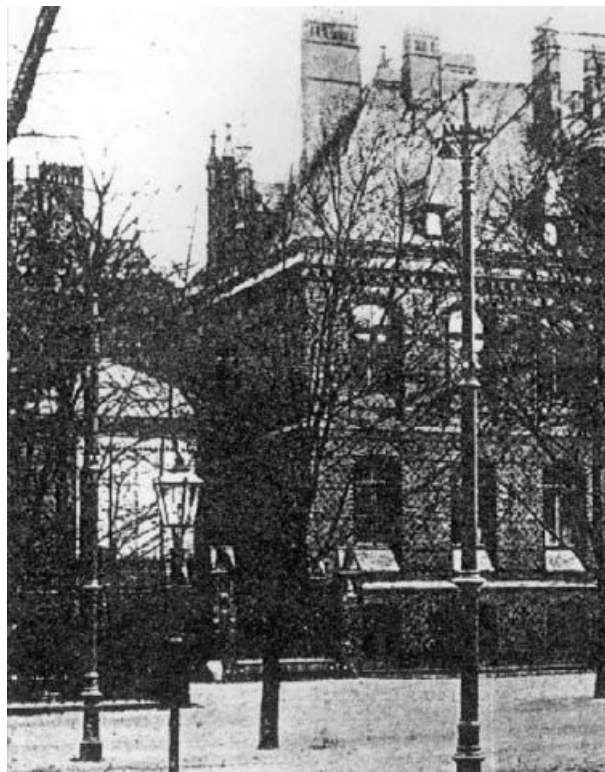


Fig. 5 Mikulicz’s Department of Surgery in Wrocław (Breslau) with a newly built aseptic operating theater (Reproduce from the collection of professor Waldemar Kozuszek, after W. Kozuszek, “Jan Mikulicz Radecki, 1850–1905. A promoter of Modern Surgery”, Wrocław University Publishing House, Wrocław 2003, fig. 43, Copyright © (2003), with permission from Professor Waldemar Kozuszek).

from antiseptic to aseptic. Mikulicz organized new chemical, bacteriology and pathology laboratories. He carried out bacteriological tests for the surgical tools and for the hands of the surgeons. He was the first surgeon in the world who introduced wearing silk gloves and surgical masks during operations.^{3,25,26} 4.5% carbolic acid was used for washing hands and surgical tools. At his Department of Surgery there were also three outpatient departments: surgical, orthopaedic and urology. There was a well-equipped library, too.^{25–27} This way Jan Mikulicz-Radecki founded a surgical center ranked among the most modern ones in Europe and in the world (Fig. 5).

In 1902 he published a paper on his experience with colon resection performed in two stages and in 1904 he described ostitis fibrosa cystica juvenilis.^{24,27,28} His disciple Ferdinand Sauerbruch (1875–1951), while working at Mikulicz’s department, experimented on animals and constructed a low pressure chamber that allowed safe intrathoracic interventions. In 1904 Sauerbruch and Mikulicz performed a pioneer operation: the first thoracotomy in the low-pressure chamber for



Fig. 6 Sauerbruch's low-pressure chamber for thoracotomy, first used in Mikulicz's department in Wroclaw (Breslau) (Reproduce from the collection of professor Waldemar Kozuschek, after W. Kozuschek, "Jan Mikulicz Radecki, 1850–1905. A promoter of Modern Surgery", Wroclaw University Publishing House, Wroclaw 2003, fig. 80, Copyright © (2003), with permission from Professor Waldemar Kozuschek).

the excision of a mediastinal tumor (Fig. 6).^{5,27,29} Jan Mikulicz invented numerous surgical tools, of which the Mikulicz' forceps are well known all over the world. In his department both ether narcosis and the mask of Schimmelbush were already in use for anesthesia.^{1,11,30}

Jan Mikulicz-Radecki was one of the leading surgeons in Europe. In 1895 at the Congress of Surgeons in Berlin he presented the results of 103 gastric resections for cancer or ulcer – no other surgical centre in Europe except Theodor Billroth's Department had such an impressive material.^{4,5}

Professor Theodor Billroth highly estimated the achievements of his disciple when he visited the Surgical Department in Wroclaw. Jan Mikulicz-Radecki founded his own surgical school on the verge of the 19th and 20th century. The Wroclaw school of surgery was highly valued and respected among the surgeons of Europe and America. Professor Jan Mikulicz-Radecki was invited to many departments in Europe, and in 1903 he even went to America, where he was enthusiastically welcome. He gave lectures and performed showroom operations in New York, Buffalo, Cleveland, Rochester, Mines, Philadelphia, Boston, Baltimore and Washington.^{4,5,16,31} Professor Mikulicz was a member of numerous surgical societies which granted him their honorary memberships for his great merits and his contribution to surgery.

Mikulicz's fame spread so wide that his Surgical Department in Wroclaw was in those times visited by many outstanding surgeons from all over the world, like Markins and Sargent from England, and from the USA the Mayo brothers (the founders of the Mayo Clinic, the largest one in the world), Cushing from Boston and



Fig. 7 Mikulicz and his team of the Surgical Department in Wroclaw (Breslau) (Reproduce from G. Kraft, *Erinnerungen an Johann von Mikulicz Radecki*, Leipzig 1926, S. 58, after W. Kozuschek, "Jan Mikulicz Radecki, 1850–1905. A promoter of Modern Surgery", Wroclaw University Publishing House, Wroclaw 2003, fig. 78, Copyright © (2003), with permission from Professor Waldemar Kozuschek).

Murphy from Chicago.³¹ A Japanese surgeon Hiyari Miyake, later Professor of Surgery at the Kyushu University in Fukuoka, visited Wroclaw and Mikulicz's Department several times. In 1900 Hiyari Miyake eyewitnessed an operation during which Mikulicz resected a cancerous esophagus without opening the chest. Here is what Hiroshi Akiyama wrote about it: Dr. Miyake, when he was young and ambitious, studied abroad in the clinic of Professor Mikulicz in Germany. Miyake described, that in 1900 Mikulicz first performed this technique (oesophagectomy without thoracotomy, the colloabdominal method) on a human, and stated: 'I had a valuable and rare opportunity to observe this operation directly during my visit with Professor Mikulicz' (...).^{32,33} Hiyari Miyake's son, Hiroshi Miyake (1901–93), a Professor himself already, in 1934–35 worked in the Surgical Department in Köln headed by Professor Anschütz. He became a friend of all the Mikulicz's family who lived in Germany, and kept in contact with them till the end of his life.^{1,5,27} Another famous Japanese doctor who worked with Mikulicz in Wroclaw was Mishigi Takayasu, who got the post of an assistant in his Surgical Department. At the same time he defended his doctoral thesis on surgery of the pancreas (Fig. 7).³⁴

Jan Mikulicz-Radecki died on June 14, 1905 in Wroclaw for gastric cancer, diagnosed by himself. Half a year earlier he underwent explorative laparotomy in his own department. He was operated on under ether anesthesia by his old friend from Vienna, Professor Eiselerberg, who found an inoperable tumor with metastases to the hepatic hilus. Shortly before he died, Mikulicz said: I am dying without any regret and satisfied with my life. I have worked according to my strength and I found esteem and happiness in the world.^{27,35,36}



Fig. 8 Stone relief depicting the Greek goddess Hygieia putting a laurel wreath upon the head of Mikulicz (Reproduce from Wrocław, photo by P. Golusik, with permission from Mr. Pawel Golusik).

Jan Mikulicz-Radecki, in his department called “king in the kingdom of surgeons”, a pioneer of modern surgery, founded in Wrocław a European or even worldwide school of surgery. The merits of Jan Mikulicz-Radecki are commemorated with a stone relief by Alfred Volkmann, sculptured 5 years after his death (May 27, 1909) at the wish of his disciples and successors, on which the Greek goddess Hygieia puts a laurel wreath of victory upon the head of Mikulicz sitting on a throne, with Pallas Athena as the symbol of wisdom standing behind him. The relief is placed by the entrance to the former Mikulicz’s Department in Wrocław, in M. Skłodowska-Curie Street (formerly Tiergartenstraße), where we have now the honor to work (Fig. 8).

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