

## Milestones

# Ernst Wertheim's radical approach to cervical cancer

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Surgical therapy for cervical cancer is a medical practice that has been reclaimed after being abandoned in the 19<sup>th</sup> century. In the early 1800s, therapy for cervical cancer consisted of surgical dissection of the diseased organ. But the morbidity and mortality were unusually high even for the rudimentary surgical know-how of those times. With the rise of radiotherapy, surgery was all but abandoned except in a few European centers. Even here, there was no clarity as to the route of surgery, degree of extirpation and post-surgical outcomes. A vaginal approach was commonly used and surgery essentially consisted of removal of the growth or amputation of the cervix. Some European surgeons (Freund and Ries) attempted an abdominal approach with pelvic lymph node dissection but bleeding and injuries to the urinary tract were key stumbling blocks.<sup>1</sup> Ernst Wertheim emerged in this scenario as a champion of the radical abdominal hysterectomy.

Ernst Theodor Wertheim was born to a professor of chemistry on 21 February 1864. He studied medicine and graduated from the University of Graz in 1888. He took up his first job as an assistant in the department of pathology. He learnt bacteriological and histological techniques and worked on fowl cholera. He would use these techniques again in the study of gonorrhoea of the female genital tract. As his interest in women's health and disease grew, Wertheim left Graz the next year. He worked at the Second University Clinic in Vienna with surgical masters such as Kahler and Billroth before he moved to Prague where he came into contact with Friedrich Schauta.

Schauta was a tremendous influence on Wertheim's professional life. The master and pupil moved back to Vienna where Schauta was appointed the head of the

First Vienna Women's clinic in 1891. Wertheim matured into a virtuoso vaginal surgeon under Schauta's tutelage. He carried on his work on bacteriology and the study of gonorrhoea and its route of spread. He also studied the cervix in detail, as the seat of gonococcal infection. With the detailed knowledge of the anatomy of the cervix and its vascular and lymphatic systems, came an interest of how cervical cancer spread. This helped him to theorize that the vaginal approach, cervical amputation and the lack of parametrial dissection were major shortcomings in the surgical treatment of cervical cancer. He embarked on an ambitious revival of the abdominal approach to radical hysterectomy. He was recognized for his expertise and bold approach and appointed director of the Bettina Pavilion, the gynaecologic-oncology department of the Elizabeth Hospital, Vienna in 1897. It was had been founded by the banker-philanthropist Baron Albert Rothschild in memory of his wife Frau Bettina who died

**Figure 1.** Ernst Theodor Wertheim.

**Figure 2.** Wertheim's surgical approach as illustrated in his monograph.

of breast cancer. It was an ultra-modern hospital equipped with the latest technology where Wertheim would work on his operation. This was also the end of his professional association with Schauta, who was the chief proponent of radical vaginal hysterectomy.

Then, as now, the parametrium was the objective of the operation and the ureter its *bête noire*. "It was a priori clear," Wertheim wrote, "that methodical treatment of the ureters was indispensable to a so-called extended operation."<sup>2</sup> An attempt to protect the ureters with catheters was futile and was given up. He would rely on direct visualization and complete dissection of the ureters to protect them. He was a methodical student of surgical pathology and maintained a strict correlation between surgical technique and histopathology findings. This allowed him to rationalize the surgery and it expanded the indications where a curative result could be offered. He systematically described the surgical approach, beginning with the palpation of the iliac nodes, followed by assessing bladder and bowel involvement and later including ligation of the internal iliac artery to control hemorrhage. He developed an instrument that would facilitate clamping off the parametrial tissue and vagina. The first 29 cases were described in 1900, about two years after he started performing this operation. The mortality rate was 38%, which (unthinkable by modern

standards) represented a magnificent result as compared to the prevailing mortality rates of 70% for these operations. He worked tirelessly over the next decade reducing this figure to 10%. The 100% follow-up of his enormous patient list (it is estimated that Wertheim performed over 1,300 operations) and the statistical analysis of the results, whereby he drew a clear distinction between "primary surgical mortality" and "consistent recovery", proved the effectiveness of the surgical approach.

Wertheim also went on to describe a vaginal operation for prolapse based on interposition of the vagina to reposition the uterus. He made extensive contribution to the prevalent knowledge of obstetrics and also developed a substrate for culturing gonococci. In his personal life, Wertheim was a difficult person. He has been described as a small, energetic, extremely disciplined, demanding personality of difficult disposition. He conducted his surgery nervously and without surgical gloves for fear of losing his "Fingerspitzengefühl", the sensitivity in his fingertips.<sup>3</sup> He was grudgingly held in high esteem by his colleagues and was a corresponding or honorary member of many foreign learned societies. He was conferred the professorship of the University of Vienna in 1910 and appointed the head of the Second Vienna Women's clinic. He created a distinguished school of gynaecological surgeons this institute became a beacon for gynecological surgeons across the world especially from Great Britain and the United States. Unfortunately, he could work for only 10 years in this position. Just six days before his 56th birthday, on 15 February 1920, he succumbed, like countless millions of other victims, to a rampant influenza pandemic. Despite the brevity of his professional career, his systematic studies and thorough surgical and technical descriptions have made an everlasting impact on gynecological surgery. The operation has served as a perpetual model for all later modifications of this surgical approach.

#### References

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