

## Epochs in Endourology

### Hans Christian Jacobaeus: Inventor of Human Laparoscopy and Thoracoscopy

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#### ABSTRACT

Hans Christian Jacobaeus performed the first clinical laparoscopic surgery in Stockholm. This pioneering procedure was based on the animal experiments of Georg Kelling (1866–1945), a German physician from Dresden, who performed the first laparoscopic intervention in 1901 using a Nitz cystoscope in a dog. In 1910, Jacobaeus published his initial experiences with laparoscopic surgery in the *Münchener Medizinischen Wochenschrift* under the title “The Possibilities for Performing Cystoscopy in Examinations of Serous Cavities.” He used this technique for diagnostic purposes in undefined abdominal complaints and functional impairment. Jacobaeus was the first who pointed out the possibility of injuring organs, especially the intestines, by inserting the trocar. In 1910, Jacobaeus recognized the immense diagnostic and therapeutic possibilities of laparoscopic surgery, as well as its difficulties and limits. He also was the first to realize the need for initial endoscopic training in animals and corpses. He promoted the development of special laparoscopic instruments to optimize and simplify the procedure.

IN 1910, HANS CHRISTIAN JACOBAEUS (1879–1937), a Swedish internist, performed laparoscopy on 17 patients with ascites for diagnostic purposes (Fig. 1). Earlier, Georg Kelling of Dresden had developed what he called “coelioscopy” in animal experiments. Jacobaeus was involved in research on artificial pneumothorax and pneumoperitoneum for therapy of tuberculous peritonitis.<sup>1–6</sup> The development of the first laparoscopic operations on the abdomen were byproducts of his studies on thoracoscopic operations. The technical equipment was very similar to the instruments used by Kelling 9 years before.<sup>7</sup> It consisted of a special trocar, the “Stille trocar” (Fig. 2), which was developed by Stockholm instrument constructor Stille, and a 14-cystoscope for endoscopy of the abdominal and chest cavities.<sup>4–6</sup>

Jacobaeus was born in 1879 in Skarhult, Sweden. He was an astute researcher who carried out his work methodically and tirelessly. As a teacher and a physician, he was aware of and very clearly understood his personal limitations. After completing his medicine studies, from 1907 to 1909, he worked as

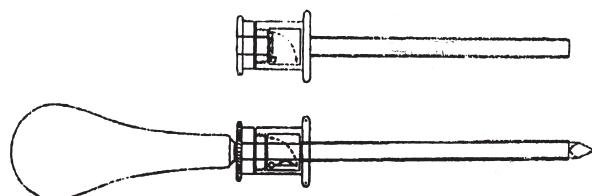
an assistant in internal medicine at the Serafimer Hospital in Sweden. In 1911, he was made a docent, and then in 1916, he went on to be professor of internal medicine at the Karolinska Institute and chief physician of the second medical clinic. He was a member of the Royal Medical Counsel and the scientific committee of the Royal Swedish Army. From 1925 until his early death in 1937, he was chairman of the Nobel Prize Committee of the Karolinska Institute in Sweden.<sup>8</sup>

Jacobaeus published his first results in 1910 in the *Münchener Medizinischen Wochenschrift* with the title: “The Possibilities for Performing Cystoscopy in Examinations of Serous Cavities.”<sup>3</sup> In 17 patients with ascites, the Stockholm internist punctured the abdominal wall after cocaineization and inserted a Stille trocar into the abdomen under local anesthesia. After partially draining the ascites and blowing in filtered compartment air, he examined the cavity using the 14-cystoscope inserted through the trocar. He described his results extensively and emphasized possible indications for laparoscopy. For example, he said the liver was especially suitable for laparoscopic



**FIG. 1.** Hans Christian Jacobaeus (1879–1937), Swedish internist and cofounder of laparoscopy and thoracoscopy.

examination and the stomach was completely unsuitable. Despite such limitations, Jacobaeus appeared to be so excited by his invention that he published multiple articles in Germany, France, and Sweden and made a presentation for an international congress in London on the subjects.<sup>5,6</sup> Another milestone in the development of thoracolaparoscopy occurred during his trip to Hamburg in 1912. There, he presented his newly developed technique to the influential university professor and publisher of medical writings, Professor Ludolph Brauer at the Hamburg-Eppendorf Hospital. Prof. Brauer was preparing the 2nd International Congress on Tuberculosis and was very interested in the use of artificial pneumothorax in the therapy of that disease. With his influence, a 170-page monograph of the Jacobaeus technique was published a few months later.<sup>2,9</sup> This included an exact description of 97 laparoscopic operations Jacobaeus had performed between 1910 and 1912 in Sweden.



**FIG. 2.** Stille trocar for insufflation of air into abdomen.

In 1912, he differentiated between laparoscopic operations on patients with and without ascites. The operation on patients with ascites was easy and problem free. On average, the patients had between 8 and 10 L of fluid, with a maximum of 23 L. The operation on ascites-free patients was much more complicated, and the risk of an intestinal injury was significantly higher. In case of such injury, it was recommended that the operation be stopped immediately. For this reason, the operation could be done only with utmost care, and the indications for this group of patients must be ascertained cautiously.<sup>5,6</sup>

Jacobaeus was also concerned with the value of explorative laparotomy and, after long discussions with various colleagues, among them surgeons, came to the conclusion that a surgeon would always tend toward a laparotomy, while an experienced internist would prefer a laparoscopy and subsequent operation when needed. This was the prevailing attitude that appears to have carried over to our current thinking.

In his research fervor, Jacobaeus debated the priority rights of Professor Georg Kelling from Dresden (Fig. 3), who performed the method ahead of him on a dog in 1901 and described it in 1902 but had not used in a clinically relevant way.<sup>10</sup> Jacobaeus commented on the battle over priority rights and the prestige connected with it as follows: “It is without a doubt that Mr. Kelling has earned the right of being the first to have the idea of performing laparoscopic operations, but because he did not pursue it, I am claiming the right to be the first to describe it in clinical application of the laparoscopy.”<sup>5,11,12</sup> It is without doubt that the equipment used by Kelling was quite sophisticated and had an amazing technical similarity to the instruments used today.<sup>10</sup>



**FIG. 3.** Georg Kelling (1866–1945), gastroenterologist from Dresden.

In his later years, Jacobaeus lost interest in abdominal laparoscopy and became entirely occupied with thoracoscopic operations until his death in 1937. Here, he is without controversy considered the first to describe the method. The therapeutic applications of artificial pneumothorax and thoracoscopic adhesiolysis with electrocautery are processes that were developed by Jacobaeus and this carry his name.

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