Surgical Treatment of Patent Ductus Arteriosus: A New Historical Perspective

Harald Kaemmerer, MD, PhD, Hans Meisner, MD, PhD, John Hess, MD, PhD, and Joseph K. Perloff, MD

The conventional surgical history of ligation of a patent ductus arteriosus (PDA) dates from August 26, 1938, when Robert E. Gross of Boston, Massachusetts, successfully ligated a PDA. It is largely unknown that in the same year and before Gross, Emil Karl Frey, a surgeon at the Medizinische Akademie in Düsseldorf, Germany, had already ligated a PDA successfully. Assuming that he would soon perform more ligations, Frey did not publish his findings, and this historic ductal operation escaped attention.

The conventional surgical history of ligation for PDA dates from August 26, 1938, when Gross, who worked at the Boston Children’s Hospital, ligated a PDA in a 7-year-old female patient “in the hope of curing endocarditis, an observation subsequently confirmed by A.S.W. Touroff in New York.”

Gross and J.P. Hubbard’s 1939 report was the first published account of a successful surgical closure of a PDA, but was it the first such operation? In 1938, or perhaps previously, Emil Karl Frey (Figure 1), an experienced surgeon at the Medizinische Akademie

From the Klinik für Kinderkardiologie und angeborene Herzfehler, Deutsches Herzzentrum München, Klinik an der Technischen Universität München; the Klinik für Herz- und Gefäßchirurgie, Deutsches Herzzentrum München, Klinik an der Technischen Universität München, München, Germany; and the Ahmanson/UCLA Adult Congenital Heart Disease Center, UCLA School of Medicine, Los Angeles, California. Manuscript received May 18, 2004; revised manuscript received and accepted July 7, 2004.

Address for reprints: Harald Kaemmerer, MD, PhD, Klinik für Kinderkardiologie und angeborene Herzfehler, Deutsches Herzzentrum München, Lazzaretstraße 36, D-80636 München, Germany. E-mail: kaemmerer@dhm.mhn.de.

©2004 by Excerpta Medica, Inc. All rights reserved.


0002-9149/04/$–see front matter ©2004 by Excerpta Medica, Inc. All rights reserved. 0002-9149/04/$–see front matter
(Düsseldorf, Germany), successfully ligated a PDA in a 14-year-old male patient who had undergone surgery with an incorrect diagnosis of a left-side intrathoracic arteriovenous fistula. A PDA was identified intraoperatively and successfully ligated, and the patient survived. Frey did not publish his procedure because he had hoped to operate on another patient in whom the preoperative diagnosis was correct and in which pre- and postoperative data were available. In his autobiography, Frey remarked: “That did not happen. The Second World War [had] begun and I was told that Gross had already published about duc tus ligation in the US. Therefore, he received all tributes for the first ligation of a patent ductus.”

The exact date of Frey’s operation is unknown because all documents regarding the operation were destroyed during the bombing of Düsseldorf in World War II. Frey’s assistant during the operation, Karl Vosschulte, and the cardiologist, E. Edens, died long ago, but some of Frey’s colleagues, coworkers, and/or successors (F Loogen, HD Schulte, W Bircks, personal communications, 2003) have provided evidence that Frey performed the first surgical closure of a PDA. W. Bircks told 1 of the authors (H.K.) that >4 decades ago he had discussed with several American cardiac surgeons the possibility that Frey had performed the operation before Gross, but the surgeons were not inclined to take notice, perhaps because of the low esteem in which Germany was regarded after the war.

In the first edition of his textbook on cardiac surgery in 1939, Frey did not mention the operative treatment of PDA, but the second edition, published in 1956, contained a short historical overview in which he mentioned Munro, A. Graybiel, Strieder, and N.H. Boyer. Frey then stated that he had successfully ligated a PDA in a 14-year-old male patient in 1938. He also stated that Gross successfully performed the same operation in 1938 in an 8-year-old female patient. In 1941, the first successful operation on an infected PDA was accomplished by Bourne et al.

In 1953, Frey mentioned in one of his scientific papers that he had performed 21 PDA ligations and that all patients had survived.

Emil Karl Frey was born 1888 in Kaufbeuren, Germany. He completed his surgical fellowship under Albert Krecke and Ferdinand Sauerbruch in Munich, Germany, and in 1927 attended the Charité in Berlin, Germany, with Sauerbruch. In 1930 he became a professor of surgery at the Academy of Medicine in Düsseldorf. From 1943 to 1958 he was chief of surgery at the University Hospital of Munich in Germany. He made many contributions to the surgery of the heart, lung, and thorax and became famous for the discovery of kallikrein (1925) and the kallikrein inhibitor Trasylol (1927). He was honored with a medal for le mérite für wissenschaft und kunst. He died in Tegernsee, Germany, on August 6, 1977. Perhaps due to the clouded political climate in Germany during World War II, Frey’s historical duc tal operation escaped attention. Further, there is the unwritten academic rule that only published data have scientific significance.

11. F. Loogen, HD Schulte, W Bircks, personal communications, 2003. Have provided evidence that Frey performed the first surgical closure of a PDA. W. Bircks told 1 of the authors (H.K.) that >4 decades ago he had discussed with several American cardiac surgeons the possibility that Frey had performed the operation before Gross, but the surgeons were not inclined to take notice, perhaps because of the low esteem in which Germany was regarded after the war.