Editorial

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In Bae Yoon, an Inventor and Pioneer in Laparoscopic Surgery

Sang Wook Bai

Department of Obstetrics and Gynecology, Severance Hospital, Yonsei University College of Medicine, Seoul, Korea.

Dr. In Bae Yoon (1936–2014) was a prolific inventor and physician who made great contributions to the advancement of gynecologic surgery in South Korea. He was granted 226 U.S. patents and 22 international patents during his lifetime.[1] He passed away on December 30, 2014 at his home in Elliot City, Maryland and will be revered and missed by not only his family, but also the doctors and scientific scholars in the field of medicine who will remember him as a passionate, dedicated man who strived to expand the boundaries of reality to those of dreams.

BIRTH, ACADEMIC ACHIEVEMENT, AND IMMIGRATION TO AMERICA

Dr. In Bae Yoon (Fig. 1) was born on July 15, 1936 in South Korea during Japanese Occupation (1910–1945).[1] He grew up during and lived through World War II (1939–1945) and the Korean War (1950–1953), which left him and his sister orphaned in a divided land.[1] Despite these hardships, he attended Yonsei University School of Medicine and earned his medical degree in 1961.[2] He served as a medical officer in the South Korean Navy for 3 years.[2] In 1964, he joined a medical residency transfer program that allowed him to immigrate to Baltimore, Maryland and participate in a rotating internship and general surgical residency at Church Home and Hospital.[2] During this residency program, he switched his major from General Surgery to Obstetrics and Gynecology and began to delve deeper into laparoscopy.[2]

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Corresponding author: Sang Wook Bai, MD, PhD, Department of Obstetrics and Gynecology, Severance Hospital, Yonsei University College of Medicine, 50-1 Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea.
Tel: 82-2-2228-2230, Fax: 82-2-313-8357, E-mail: SWBAI@yuhs.ac

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INVENTIONS IN LAPAROSCOPIC AND ENDOSCOPIC SURGERY

During his residency, Dr. Yoon was exposed to tubal ligation, which was one of the few surgeries performed laparoscopically at the time. Although laparoscopic surgery was novel and risky at the time, he believed that safer techniques that would reduce complications could be found. He advocated that laparoscopic surgery would allow for a shorter recovery time and better cosmetic results in the long run. After completing his residency in 1969 and a fellowship the year after, he joined a private practice in Hagerstown and Bethesda.[3] Several successful years later, he joined the Johns Hopkins University School of Medicine as a full-time Assistant Professor and as the Director of the Laparoscopic Sterilization Clinic from 1973 to 1978.[3]

His first invention was the "Yoon Ring," which received a patent (US Patent 3870048) in 1975 (Fig. 2).[4-7] The innovative method built upon laparoscopic tubal ligation by placing a silastic ring around the fallopian tube to thwart pregnancy. It was manufactured with KLI Incorporated and could prevent many complications associated with other laparoscopic methods that used electrocautery. It was a simple, but effective and reversible method.[8-10] He continued to toil with drawing, as well as tinkering with and inventing safety systems for laparoscopic procedures. He built devices needed in general surgery, such as retractable instruments, stents, needles, sutures, clip appliers, trocars, and catheters.[3] His work in laparoscopic surgery opened up new approaches applicable to many surgical fields, many of which are now preferred over open surgery.

He was appointed the Chairman of the Obstetrics and Gynecology Department at Wyman Park Hospital in 1981 where

Fig. 1. Dr. In Bae Yoon (1936–2014).

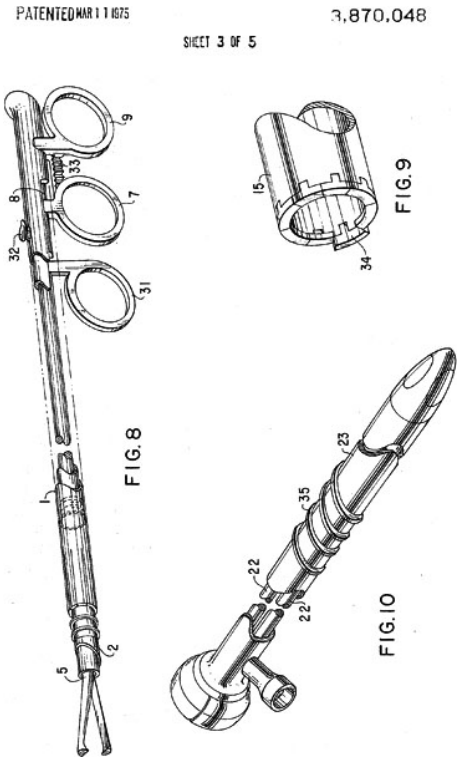

Fig. 2. Dr. Yoon's first patent was for the Yoon Ring.

he continued his research in endoscopic surgery.[4] He invented the Safety Trocar, which is a small tubular port inserted into a small abdominal incision that allows endoscopic surgical instruments to enter the body safely.[11] He attempted to court the support of a few instrument manufacturing companies, such as Richard Wolf GmbH, Olympus, and Cabot Medical, to produce his marketable safety trocar designs to no avail.[3] In 1985, Dr. Yoon continued the development of his inventions by establishing his own company, Yoonitech, Inc.[3] He worked independently until 1988 when he began his partnership with Johnson & Johnson's subsidiary, Ethicon.[3] Ethicon was later re-established as Ethicon Endo-Surgery (EES) and manufactured the Surgical clip and Applicator and Shielded trocar. They brought to life many of Dr. Yoon's inventions. As EES Patent Attorney Matt Goodwin said in 1995, "Dr. Yoon is the most prolific inventor in the field of medicine this century."[1]

Fig. 3. Dr. Yoon performing laparoscopic surgery.

LATER LIFE AND LEGACY

Remembering and wanting to contribute to the furthering of future young inventors, Dr. Yoon established the I.B. Yoon Multi-Specialty Endoscopic Research & Training Center at the Clinical Medical Research Center in Yonsei University School of Medicine in South Korea in 1996 (Fig. 3). In his dedication address, he stated "This is one of the happiest days of my life. As you go through life, you develop goals and desires based on your primary interests. I am happy, primarily because this center has been one of my dreams for a very long time. I dreamt of a clinical institute at Yonsei that would be equipped with the most advanced technologies, such as endoscopic or minimally invasive procedures, to improve patient care. I believe that physicians at Yonsei will take quantum leaps in medical care and practice based on the innovation and integrity I have already witnessed here." Bestowing a generous donation each year to his alma mater, he also supports gifted medical students by providing scholarships. The In Bae Yoon Memorial Minimally Invasive and Robot Surgery Center at Severance Hospital continues to treat a phenomenal number of cases and train many physicians in advanced technologies.

He received the "Creative Thinking National Recognition Award" in 1997 from The Creative Thinking Association of America for his exceptional impact on the field of medicine.[1]

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From 1995 to his retirement in 2005, he continued to work in partnership with EES for the construction of instruments and devices for laparoscopy and endoscopy.[1] After Dr. Yoon passed away in 2014, the Smithsonian's National Museum of American History collected many of his surgical instruments, prototypes, and his research papers.[3] They focus on the Yoon Ring, a penetrating instrument with safety shield, and surgical clips and applicator. These are now on display for children, students, medical professionals, and people of all backgrounds.

His endless efforts to discover new surgical methods and devices continue to inspire the next generation. Instead of being hindered by the tools given to us, he showed us that endeavoring to improve and expand ground-breaking methods are the future. Today, Dr. Yoon's lifelong dream of minimally invasive surgical techniques are universally accepted and considered the standard of care. He had always been determined and focused on developing new methods and technology for the best care and treatment of patients. He never got tired or gave up; he continued to seek innovative ideas and to see them fully materialized.

ORCID

Sang Wook Bai https://orcid.org/0000-0001-7724-7552

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