History of ophthalmology at Baylor University Medical Center

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Ophthalmology has been a specialty at Baylor University Medical Center (BUMC) since the opening of its predecessor institution, the Texas Baptist Memorial Sanitarium. The first operative procedure at that institution was an ocular surgery performed by Dr. Edward H. Cary in 1909 (1).

A review of the practice of ophthalmology at BUMC and its predecessor institutions over the past 100 years reveals the accelerated advances in medical and surgical treatment of the eye during that period. The most significant advances in the treatment of eye diseases and ocular surgery occurred in the 20th century. To place these in perspective, I review some notable discoveries and developments before the 20th century that allowed for our most recent advances.

HISTORY OF OPHTHALMOLOGY

Cataracts

The most common eye surgery is cataract extraction. The earliest written reference to cataract surgery was found in Sanskrit manuscripts dating from the fifth century BC. It was attributed to the Hindu surgeon Susruta and described a procedure called couching, in which the cataractous lens is displaced with a sharp instrument so that it falls into the vitreous cavity, clearing the visual axis. Since there were no corrective glasses or lenses, vision was still significantly blurred (2).

Needling or discission of cataracts, a procedure in which the cataractous lens is broken up into smaller pieces to facilitate absorption, appeared in *De Medicinæ* by Celsus in AD 29 (2).

Modern cataract surgery, in which the cataractous lens is removed from the eye, was introduced by Jacques Daviel in Paris in 1748. That procedure involved removing the inner contents of the lens and leaving the posterior lens capsule and the attached zonules that held it in place (2). Samuel Sharp of London introduced the intracapsular procedure in 1753, in which the entire lens is removed through an incision by applying thumb pressure (2). The use of silk sutures for cataract surgery was first described by Henry Willard Williams of Boston in 1867 (2).

General anesthesia for surgical procedures was not available until the 1840s. In 1884, topical eye drops of cocaine were used as a local anesthetic in ocular surgery (2).

Figure 1. Barry W. Uhr, MD, performing cataract surgery with the first phacoemulsification (Kelman Cavitron) machine at BUMC in 1983.

From the 1940s to the 1970s, extracapsular and intracapsular cataract removal techniques were improved through the development of better instrumentation and smaller sutures with small needles and the use of the operating microscope. The development of antibiotics decreased the risk of infection. During the 1960s, intracapsular cataract removal grew in popularity with the introduction of the cryoprobe; its freezing instrument tip adheres to the lens and forms an ice ball through the capsule, thereby allowing removal of the entire lens with less chance of lens material remaining in the eye.

Two significant changes affected the future of cataract surgery during the late 1960s. Charles Kelman, MD, developed an ultrasonic probe and aspiration machine that permitted cataract removal through a smaller incision by a method called phacoemulsification (*Figure 1*). At the same time, tiny intraocular lenses were made from polymethylmethacrylate plastic and could

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Figure 2. Early iris-suture, pupil-supported “Medallion” intraocular lens circa 1976. Intraocular lens implants revolutionized cataract surgery.

be implanted within the eye when the cataract was removed (Figure 2). The first such plastic lens had been implanted by Harold Ridley in England in 1950 but did not gain wide acceptance until better designs and methods of sterilization resulted in fewer complications (3). The first such implants were done in the USA in the late 1960s but did not gain wide acceptance until the mid to late 1970s.

These procedures required better visualization of the details of the eye during surgery. The operating microscope, whose use had progressively increased in the 1960s and 1970s, became a necessity in cataract and lens implant surgery. The microscope is also used in corneal and glaucoma surgery and in vitreous and some retinal operations.

Retinal detachment

Retinal detachment was described in animal eyes in 1722 to 1740. The early clinical observations were between 1841 and 1847 when the white vascularized membrane was seen through dilated pupils. Clinical evaluation and description of retinal detachments and other intraocular diseases became possible with the invention of the ophthalmoscope by Hermann von Helmholtz in 1850. He was professor of physiology successively at Königsberg, Bonn, and Heidelberg and professor of physics in Berlin (4). This was the first instrument to provide a view of the inside of the eye and thus allow examination and treatment of intraocular diseases.

In 1920, Jules Gonin, the great ophthalmologist of Lausanne, was the first to report that he had treated retinal detachments with tears by cauterizing the sclera in the area of the tear. In 1929 he reported on his work since 1920, and it was confirmed by Arruga of Barcelona, Amsler of Lausanne, and Veil of Strasbourg, all of whom he had taught and who practiced the same techniques. The result was worldwide acceptance and use of a procedure to save the sight in eyes that would previously have been considered untreatable (4). This advance was a stimulus for further development of even better procedures, such as encircling scleral bands and buckles to indent the sclera against a detached retina for better adhesions, cryotherapy in place of cautery to minimize damage to the sclera, and photocoagulation through a dilated pupil to avoid more extensive surgery in cases suited for that treatment. Developments in recent years include laser therapy of retinal diseases, vitrectomies for removal of opaque vitreous, removal of vitreous traction strands to the retina, and

peeling and removal of preretinal membranes and submacular neovascular membranes.

OPHTHALMOLOGY AT BAYLOR

The first ophthalmologist at BUMC, then known as the Texas Baptist Memorial Sanitarium, was Dr. Edward H. Cary. After serving as dean of the University of Dallas Medical Department, he held several positions in the successor school, Baylor University College of Medicine: dean (1903–1920); dean emeritus (1920–1943); professor of diseases of eye, ear, nose, and throat (1903–1920); and professor of ophthalmology (1920–1943) (5). In the early years, ophthalmology and otolaryngology were both a part of the specialist’s practice. Ophthalmology was the first board-certified medical and surgical specialty in the USA. The American Board for Ophthalmic Examinations was established on May 8, 1916, and the first examinations were given on December 13 and 14, 1916 (6).

Most ophthalmologists practice general or comprehensive ophthalmology; however, now multiple subspecialists limit their practices. Although no subspecialty boards exist, some ophthalmologists have completed fellowships in retinal, corneal, and infectious diseases, glaucoma, ophthalmic plastics, pediatrics, uveitis, and neuroophthalmology. Cataract surgery is the primary operation performed by general or comprehensive ophthalmologists. Refractive surgery is relatively new (1980s and 1990s), having begun with radial keratotomy and progressed through photorefractive keratectomy to laser-assisted in situ keratomileusis (LASIK), although these procedures are performed in outpatient laser centers or in the ophthalmologist’s office.

A wide spectrum of ophthalmological services is provided by the staff ophthalmologists at Baylor. Most procedures are done in an ambulatory surgery center or on an outpatient basis at the hospital; thus, the need for hospitalization is minimal. Ophthalmic trauma cases are usually treated in the hospital, frequently on an outpatient basis or with a very short inpatient stay.

In the early part of the 20th century (1903–1943), the faculty members of the University of Dallas Medical Department, later the Baylor University College of Medicine, were the principal members of the Texas Baptist Memorial Sanitarium (later named Baylor Hospital, Baylor University Hospital, and BUMC). When the Medical Arts Building in downtown Dallas was constructed in 1923 and later added a hospital in 1928, much of the private practice of ophthalmology and ophthalmic surgery was centered there. When the Baylor University College of Medicine moved to Houston in 1943 and the Southwestern Medical Foundation formed the Southwestern Medical College, the medical staff of Baylor University Hospital was disrupted; the medical staff had been largely composed of medical school faculty. On January 12, 1946, a complete reorganization and modernization of the medical staff was instituted (7). When the Medical Arts Building was closed (about 1977) and subsequently demolished to expand the buildings of the Republic Bank, some of the ophthalmologists who practiced there moved to the BUMC area and began to use it as their primary surgical facility. Some chose to use other general hospitals or specialty hospitals such as the new Presbyterian Hospital of Dallas and Mary Shiels Hospital.

From 1950 to 1974, ophthalmic surgery was performed in the operating rooms on the fifth floor of the Truett Building. These

Figure 3. Kenneth Foree III, MD, performing ocular surgery on a patient at BUMC with William L. Berry, MD, assisting in 1976.

rooms were shared with otolaryngology and oral surgery. In 1974, 4 new operating rooms were constructed on the seventh floor of the Collins Building to be shared between ophthalmology and plastic surgery (*Figure 3*). Patient rooms were on the same floor. This arrangement was very convenient for patients and physicians and lasted until 1995, when the economics of maintaining a self-contained unit dictated that the unit be closed. It was reopened as the Texas Surgery Center, an outpatient surgery facility, but it did not provide the equipment necessary for ophthalmic surgery and therefore was no longer used by ophthalmologists.

Having procedures performed on patients in the hospital facility on an outpatient basis was not as cost-effective for the payers as having them performed in an ambulatory surgery center with a lower overhead. Ambulatory surgery had replaced the inpatient procedures, and with the opening of multiple ambulatory surgery centers and limits on reimbursement for inpatient procedures, a new era had evolved.

Since 1995, ophthalmic surgery requiring hospitalization has been performed in the fifth-floor Truett operating rooms. The vast majority of ophthalmic surgery at BUMC is done at the ambulatory surgery centers, Baylor SurgiCare and Physicians Day Surgery.

The Baylor Visual Function Center was established in 1981 to provide additional ophthalmic evaluation and treatment services. The facility was located in the Baylor Doctors Building at 3707 Gaston Avenue. Perry Speros, PhD, was recruited from Texas Tech Medical School in Lubbock to administer the center. The first function of the center was to provide electrophysiologic function testing of vision. Initially, Dr. Speros performed electroretinography and visually evoked response testing for ophthalmologists throughout the area. As acceptance of the Visual Function Center grew, its functions expanded to include automated visual field testing in 1983. In the mid 1980s, the center acquired an argon

Figure 4. The first argon laser for ocular treatment at the Baylor Visual Function Center circa 1984.

laser photocoagulator and a Nd:YAG laser (photodisruptor) for use by Baylor ophthalmologists (*Figure 4*). These devices have expanded the ophthalmologists' ability to treat glaucoma, diabetic retinopathy, and opacified posterior lens capsules after cataract surgery. Because of his background in physiologic optics, Dr. Speros developed a Center for the Partially Sighted in the late 1980s. This center has provided magnifying and other visual aids to patients with limited vision. In 2000, a photodynamic therapeutic laser was added to the center for the treatment of wet macular degeneration, which is the leading cause of blindness in people over the age of 50 in the USA. The Visual Function Center continues to provide these capabilities today, although it will move to another location in the medical center in the near future with the pending closure of the Baylor Doctors Building.

The chiefs of ophthalmology

The Department of Ophthalmology has been led by 9 chiefs over the past century (*Figure 5*):

- Edward H. Cary, MD (1903 to the 1940s) (8). Dr. Cary graduated from Bellevue Hospital Medical College and completed his ophthalmology training at the New York Eye and Ear Infirmary, returning to Dallas in 1901 to begin his practice. He served as dean of the Baylor University College of Medicine in Dallas from 1902 until 1920 but maintained the chair of ophthalmology until the medical school moved to Houston in 1942.
- Kelly Cox, MD (some sources say he was chief from about 1928 until possibly the early 1940s). Dr. Cox graduated from Baylor University College of Medicine in 1920. He trained at the New York Hospital in internal medicine and diagnosis from 1921 until 1922. He then studied ophthalmology at the New York Eye and Ear Hospital from 1922 to 1924. He returned to Dallas and practiced ophthalmology with Dr. Edward Cary and later with Dr. Kenneth Foree III.

Figure 5. Chiefs of ophthalmology at Baylor. Top row: Edward H. Cary, MD, Kelly Cox, MD, Lester H. Quinn, MD. Middle row: Thomas M. McCrory, MD, Kenneth Foree III, MD, William L. Berry, MD. Bottom row: William B. (Rand) Spencer, MD, Norman Slusher, MD, James H. Gray, MD.

- Lester H. Quinn, MD (the 1940s to 1964). Dr. Quinn graduated from Indiana University Medical School in 1927. He completed his residency in otolaryngology and ophthalmology at the Wisconsin General Hospital in 1930.
- Thomas M. McCrory, MD (1965 to 1974). Dr. McCrory graduated from Southwestern Medical School in Dallas in 1944. He completed his residency in ophthalmology at Parkland Hospital and the Veterans Affairs Hospital in 1952 and joined the Baylor staff that year.
- Kenneth Foree III, MD (1975 to 1994). Dr. Foree graduated from the University of Texas Southwestern Medical School in 1948. He completed his ophthalmology residency at the New York Eye and Ear Infirmary in 1954 and practiced with Dr. Kelly Cox in the Medical Arts Building in Dallas before moving to the Baylor Medical Plaza when he became chief of ophthalmology at Baylor in 1975.
- William L. Berry, MD (interim chief, 1994). Dr. Berry graduated from the University of Texas Southwestern Medical School in 1967 and completed his ophthalmology residency there in 1972. After serving 2 years in the US Air Force, he joined Drs. Foree and Uhr in practice in the Baylor Medical Plaza in 1974.
- William B. (Rand) Spencer, MD (1995 to 1998). Dr. Spencer graduated from Tulane Medical School in 1974. He completed his ophthalmology residency at the Alton Ochsner Medical Foundation in 1977. He then completed a fellowship in diseases of the retina with the Retina Associates and

Schepens Eye Research Institute and a second fellowship in retina and vitreous diseases at the Massachusetts Eye and Ear Infirmary and Harvard Medical School in 1979. Dr. Spencer began his practice at Baylor in 1979.

- Norman Slusher, MD (interim chief, 1999). Dr. Slusher graduated from the University of Missouri Medical School in 1974. He completed his ophthalmology residency at The University of Texas Southwestern Medical School in 1978 and began his practice at Baylor that same year.
- James H. Gray, MD (1999 to present). Dr. Gray graduated from The University of Texas Medical School at San Antonio in 1971. After serving at the Walter Reed Medical Center in Washington, DC, from 1972 to 1975, he completed his residency in ophthalmology at the Wilmer Eye Institute at the Johns Hopkins Hospital in 1978 and began his practice at Baylor that same year.

THE FUTURE

The future of ophthalmology is bright. Technology has provided us with equipment to prevent or correct many previously blinding conditions. Modern ophthalmic surgical procedures have a low morbidity for the eye, and advances in medical treatments in the form of eye drops have decreased the need for surgery for many conditions such as glaucoma and corneal diseases. Gene therapy may allow the prevention of many ocular diseases.

The challenges we face in treating ocular diseases are related to the aging of the population and the changes concomitant with aging. Prevention of and treatment for macular degeneration is probably the greatest challenge. A better understanding of glaucoma and its relationship to the aging eye will help us prevent the ravages of this disease. Further improvements in cataract surgery and the development of injectable artificial lens implants will continue. Most of these advances will be delivered to patients in an ambulatory surgery or office environment.

The best medical and surgical care for patients occurs when a patient's total health care needs are coordinated by a team of physicians. Ophthalmologists will continue working with other physicians on the BUMC staff to deliver the best care to our patients.

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