UT News
Office of Medical Information
The University of Texas Health Science Center at Dallas
5323 Harry Hines Boulevard Dallas, Texas 75235
214/688-3404

September 20, 1985

CONTACT: Tommy Joy Bosler
Office: 214/688-3404
Home: 214/327-1773

****"Living contact lens" results from keratorefractive surgery

DALLAS--Imagine a "living contact lens," one that never has to be taken out and cleaned because it grows to the surface of the eye and becomes an integral part of it. It sounds like science fiction, but it is possible today because of a surgical technique--one of several in the growing field known as keratorefractive surgery--now being done at The University of Texas Health Science Center at Dallas.

Kerato refers to the cornea and *refractive* to the focusing of light. Keratorefractive surgery corrects defects in vision by changing the shape of the cornea to focus a visual image more sharply. It is effective in correcting many of the same problems that can be helped by glasses or contact lenses: to correct near-sightedness or farsightedness, to compensate for cataract surgery or to correct specific corneal deformities.

All of these problems result in poor focusing of light rays as they enter the eye through the clear cornea that covers the iris (the colored part of the eye), pass through the lens and focus on the retina, the light-sensitive tissue at the back of the eye. The retina converts light impulses into nerve impulses, which travel along the optic nerve to the brain, where "seeing" actually takes place. For good vision the light image must be sharply focused on the retina, not in front of or behind it. The cornea accomplishes about two-thirds of the focusing and the lens, the remainder.

Defects in either the cornea or the lens are traditionally corrected by glasses or contact lenses. Now surgery offers new alternatives.

"For some conditions the new corneal surgery offers the only hope of normal vision and for others it is an innovative alternative, but it's not for just anyone who wants to quit wearing glasses or contacts," explains Dr. Mary Beth Moore, UTHSCD assistant professor of ophthalmology who did a post-residency fellowship in keratorefractive surgery at the Louisiana State University Eye Center in New Orleans.

Take the "living contact lens," a result of surgery in which a thin layer of specially treated, donated corneal tissue is laid over the patient's cornea and sewn in place around its edge. The technique, called *epikeratophakia,* forms a graft of new tissue that changes the shape of the cornea and enhances its ability to focus.

"This process was originally developed to help patients who have had cataract surgery," says Moore. "It has been especially helpful in babies born with cataracts. The clouded lens must be removed, as in older adults, but most ophthalmologists do not put implanted synthetic lenses in babies' eyes because we don't know how the eye will tolerate the lens over 50 to 60 years. And young children are too active and impatient to wear contact lenses.

"There is a critical time in a child's life, from birth to about five years of age, when the eye must have clear vision for the visual system to develop properly. If the eye is not clearly focused during this critical time, the child will develop amblyopia, or 'lazy eye.' By the time a child would be able to wear contacts, it would be too late to reverse the amblyopia. Epikeratophakia offers an alternative for these children."

In addition to infants, older adults who have had cataract surgery without receiving an implanted synthetic lens are good candidates for epikeratophakia. Patients with extreme nearsightedness or farsightedness also can be helped by the surgery. People with keratoconus or keratoglobus, two types of corneal deformity caused by thinning of the cornea, can now be treated by epikeratophakia as an alternative to corneal transplant.

(MORE)

The new surgical technique was developed at Louisiana State University five years ago. Until recently, LSU was the only source of transplantable corneal tissue. Now there is one commercial source in California, and soon the Department of Ophthalmology, in conjunction with the Lions Sight and Tissue Foundation at UTHSCD, will provide tissue.

UTHSCD ophthalmic surgeons are taking part in a nationwide study of the effectiveness of epikeratophakia. Moore, along with Dr. James McCulley, chairman of the Department of Ophthalmology, and faculty members Drs. Wayne Bowman and Jim Merritt, will work either with patients referred for surgery by other doctors or patients who come to one of the health science center's affiliated teaching hospitals for care.

A second type of keratorefractive surgery, *radial keratotomy*, is effective for people with mild to moderate nearsightedness. This technique involves making eight short slits in the cornea in a pattern like the spokes of a wheel. The incisions flatten the cornea and cause light rays to focus farther back in the eye, closer to the retina.

Radial keratotomy was developed in Russia and has been practiced in the United States for about five years. Recently, a group of ophthalmologists evaluated the process at nine medical centers across the country and reported it to be effective. As a result, the procedure has gained more acceptance among conservative practitioners than it had originally.

Radial keratotomy will be performed by UTHSCD ophthalmologists under strict guidelines. Even though there have been many advances in radial keratotomy, much remains to be learned; therefore, UTHSCD ophthalmologists will follow a strict protocol and require that all patients meet rigid criteria. Included in these will be a requirement that the patient be intolerant to contact lenses and spectacles.

Because the incisions in the cornea weaken it to some extent, radial keratotomy is not recommended for people engaged in activities at high risk for receiving a direct blow to the eye.

A third type of corneal surgery, called *keratomileusis*, is effective for moderate to severe nearsightedness. In this process, a slice of the patient's cornea is removed, and a pre-carved piece of corneal tissue is sewn on. As in epikeratophakia, the transplanted tissue becomes an integral part of the patient's eye.

Keratomileusis has been used in Bogota, Colombia, for almost 20 years. However, there are very few locations in the United States where the surgery is performed because it takes extensive training, is difficult to perform and uses expensive special equipment. UTHSCD will initiate the surgery in about six months.

In addition to correcting the conditions mentioned above, keratorefractive surgery can correct some cases of astigmatism by means of slits in the cornea.

"Keratorefractive surgery is one of the most exciting developments in ophthalmology in decades," says Ophthalmology Chairman McCulley. "It is going to change the practice of ophthalmology and have a major impact on the way visual defects are dealt with in the future. The faculty members in our department, under the guidance of Dr. Moore, hope to be leaders in its development and in providing the latest surgical advances directly to patients in North Texas."

XXXX

Distribution: AA,AB,AC,AF,AG,AH,AI,AK,SC,SL