University of Iowa Health Care
Department of Ophthalmology and Visual Sciences

Implantable Miniaturized Telescope (IMT)

Background
The IMT was first approved by the FDA in 2010. 6 years later, 500 patients have had this device implanted in their better seeing eye.

Technical Specification of the IMT
- Magnification – 2.7x (magnification benefit for a given patient is unknown)
- Field of view – 24 degrees
- Retinal illumination – 40% transmission (60% reduced brightness)

Testing Protocol
- Patients must be 65 years of age or older.
- To qualify for consideration with an IMT, the patient must be phakic in the eye being considered for the IMT.
- The patient is first evaluated by a retina specialist who confirms end stage macular disease with no CNVM.
- Visual acuity must be between 20/160 and 20/800 in the eye to be implanted.
- The patient is next seen by vision rehabilitation where they must see at least 1 line better on an ETDRS chart with the external telescope simulator. The expected improvement is 2.3x which is equal to 3-4 lines of improvement.
- The patient is next seen by a cornea specialist for an endothelial cell count and anterior chamber depth assessment.
- If the patient meets all the aforementioned criteria and is interested in pursuing the IMT, they are next seen by an occupational therapist for a pre-implantation assessment.
- The patient is made aware that they will be required to work weekly with an OT for 2-4 months, post-implantation.
    - The patient will have their first post implantation evaluation by the OT to look at ambulation skills 2 weeks post implant.

Implantation Information
- IMT is implanted in the bag following a 12mm limbal incision and a 7mm capsulorhexis.

After Implantation
- There is a great deal of inflammation and the patient will be on steroids (Q1-2 hours) and dilating drops for 2 to 3 weeks.
- There will often be a great deal of astigmatism post implantation.

Additional Information
- Patients will not be able to drive with the IMT, because the field of view is only 24 degrees with this device.

- Patients will still need to use devices for best visual functioning, particularly to do any type of reading.
- Only about 20% of people interested in the IMT prove to be good candidates.

Contraindications:

Implantation of the IMT is contraindicated in patients:

- With Stargardt macular dystrophy.
- With central anterior chamber depth (ACD) < 3.0 mm; measurement of the ACD should be taken from the posterior surface of the cornea (endothelium) to the anterior surface of the crystalline lens.
- With the presence of corneal guttata.
- Who do not meet the minimum age and endothelial cell density
    - Requirements (age 65 to < 70 min. cell density ≥ 2300 cells/mm2; age 70 to < 75 min. cell density ≥ 2000 cells/mm2; age 75 or greater min. cell density ≥ 1800 cells/mm2)
- With cognitive impairment that would interfere with the ability to understand and complete the Acceptance of Risk and Informed Decision Agreement or prevent proper visual training/rehabilitation with the device.
- Who have evidence of active CNV on fluorescein angiography or treatment for CNV within the past six months.
- With any ophthalmic pathology that compromises the patient's peripheral vision in the fellow eye.
- With previous intraocular or cornea surgery of any kind in the operative eye, including any type of surgery for either refractive or therapeutic purposes.
- Who have prior or expected ophthalmic related surgery within 30 days preceding intraocular telescope implantation.
- With a history of steroid-responsive rise in intraocular pressure, uncontrolled glaucoma, or preoperative IOP > 22 mm Hg, while on maximum medication.
- With known sensitivity to post-operative medications.
- Who have a history of eye rubbing or an ocular condition that predisposes them to eye rubbing.

- Additionally, the potentially operative eye cannot have:
    - Myopia > 6.0 D
    - Hyperopia > 4.0 D
    - Axial length < 21 mm
    - A narrow angle, i.e., < Schaffer grade 2
    - Cornea stromal or endothelial dystrophies, including guttata
    - Inflammatory ocular disease

    - Zonular weakness/instability of crystalline lens, or pseudoexfoliation
    - Diabetic retinopathy, untreated retinal tears, retinal vascular disease, history of retinal detachment, retinitis pigmentosa, intraocular tumor or optic nerve disease

- Finally, in eyes in which both haptics cannot be placed within the capsular bag during surgery, the intraocular telescope should be removed and replaced with a conventional intraocular lens (IOL); sulcus fixation of either one or both haptics increases the risk of severe endothelial cell loss and corneal transplant.

Patients who are interested in the IMT, should first have a vision rehabilitation evaluation with Drs. Shahid or Wilkinson. During that evaluation, the IMT will be demonstrated along with other vision rehabilitation devices and strategies they will benefit from.