

Everything You Need to Know About Intacs

The screening and treatment for keratoconus has improved dramatically over the last ten years. Keratoconus is being detected earlier than ever before, and there is an expanding list of treatment options available for patients to help prevent or delay the need for invasive surgical intervention, and there are more to come.

One of the currently available treatment options is corneal ring segments. There are a number of these available worldwide, with [Intacs® \(Addition Technology, Lombard, IL\)](#) being the only one currently approved in the U.S. Intacs® were originally approved to treat myopia but in 2004 were given an FDA Humanitarian Device Exemption to be used in keratoconus. The rings are used in an attempt to improve quality of vision which is achieved by flattening the cornea and reducing corneal distortion.¹

The first stage in keratoconus management is, of course, early detection. Optometrists, as the primary point of contact for most eyecare needs in the U.S., are responsible for detecting the earliest signs of keratoconus. Such signs include an increase in astigmatism, a change from with-the-rule to against-the-rule cylinder, steepening on topography, posterior corneal elevation changes on tomography, and localized thinning on epithelial thickness maps.^{2,3} When the earliest clinical signs of keratoconus are detected, it is important that the OD refers to a cornea specialist for further investigation. The standard of care is changing!

One important point to remember is that ring segments do not alter the strength of the cornea and thus do not slow the rate of progression.

With the approval of cross-linking in the U.S., it is no longer acceptable to

hold on to a patient, especially a young patient, to monitor or try specialty contact lenses. Cross-linking offers a non-invasive way to slow or completely halt the progression of the disease.⁴ It is the primary care optometrist's responsibility to send the patient for a cross-linking evaluation as soon as possible.

There will, no doubt, be patients with corneal disease that is too advanced to be considered for cross-linking alone.

One important point to remember is that ring segments do not alter the strength of the cornea and thus do not slow the rate of progression. Ring segments are used to try and change the shape of the cornea to improve visual quality, try a new contact lens fitting, or be fit back into spectacles. A patient's eligibility for Intacs® will vary slightly between cornea practices, but most include the following criteria:

- Moderate to severe reduction in best-corrected visual acuity
- Lack of functional vision with spectacle or lens correction
- Minimum age of twenty-one
- Clear central corneas
- Minimum corneal thickness of 400µm at location of ring implantation
- Patient's only other option for regaining vision is a keratoplasty

The treatment takes ten to twenty minutes, depending on the number of segments being implanted (either 1 or 2). Most cases are now performed using a femtosecond laser. The laser is used to create an arc-shaped pocket in the stromal tissue at approximately 70% depth (Figure 1). The ring segment is then inserted into the channel. The treatment is non-invasive and the epithelium remains intact, so there is minimal discomfort. The cornea is usually clear and quiet by the next morning, with only the vertical insertion point incision remaining visible as can be seen in Figure 2. Patients are prescribed prophylactic antibiotics and steroids for anywhere between three days and two weeks following the procedure. Some providers may also give oral painkillers to use as needed over the first few days.

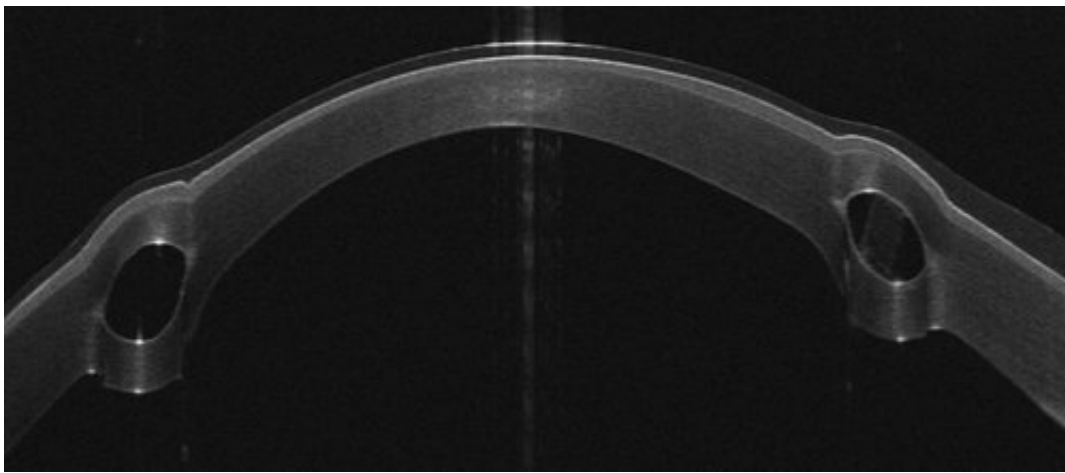


Figure 1. Optical coherence tomography B-scan image showing the depth of the ring segments and associated stromal changes.

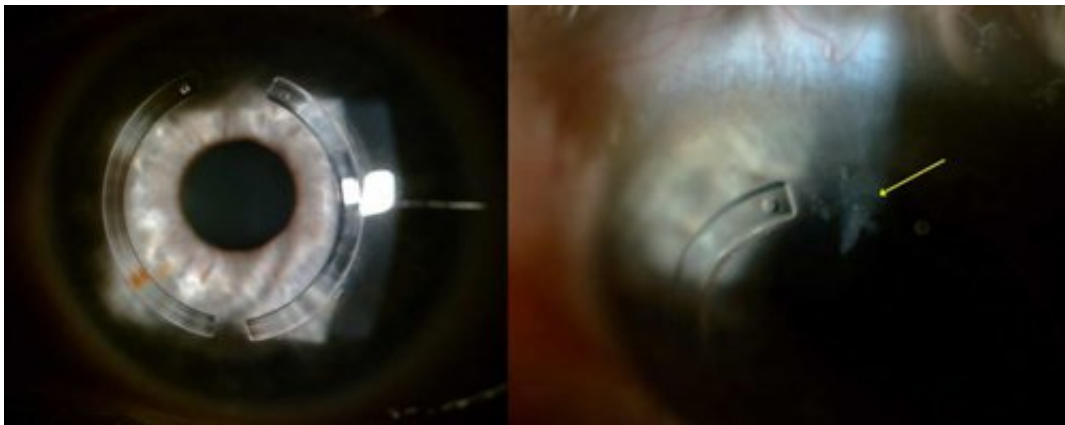


Figure 2. Slit-lamp photos taken 24 hours after treatment. The cornea is clear and ring segments are stable within the channel (left), with the superior access point visible (right).

Routine follow-up is similar to other corneal refractive surgery procedures, with most patients being seen at one day, one week, one month, three months, and somewhere between six and twelve months post-operation. Although complications and side effects are rare, you, as the co-managing optometrist, need to be on the lookout for a few specific clinical findings. In the early postoperative period (within the first one to two weeks) it is important to look for any signs of corneal infection or inflammation and that the segments are stable within the channel.

Even after the first few weeks, it is important to evaluate the pocket that

was created as well as the health of the tissue overlying the segments. Some patients may develop white lipid deposits or haze in the channel. Both of these findings are considered generally benign. Additionally, epithelial or stromal defects, as seen in Figure ³, may occur anywhere from months to years after treatment. An epithelial defect is often treated by a bandage contact lens and antibiotic coverage. However, if stromal melting has occurred, there may be a need to surgically remove the ring segment.

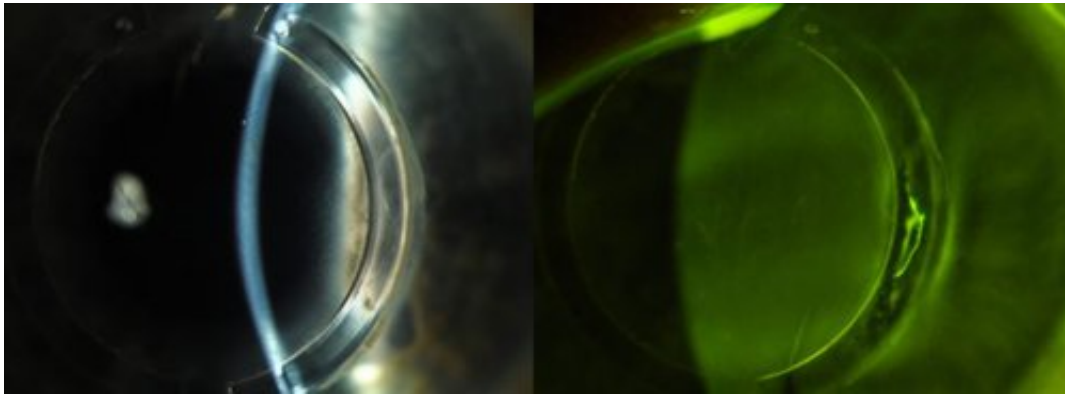


Figure 3. Slit-lamp photos showing mild haze with an overlying corneal epithelial defect (left) that is further highlighted by fluorescein staining (right)

Visual rehabilitation considerations are also important for these patients. The corneal shape can take weeks or even months to fully stabilize, therefore it is important to formulate a plan around how you will manage the visual needs of the patient. It is best to discuss the treatment plan with the corneal specialist or one of the optometrists at the treatment center and work together toward a common goal. The patient should also be informed before the procedure that there may be a period where it could be difficult to find an acceptable optical correction.

Some things to consider/discuss with the patient include:

- Risk of anisometropia
- Their glasses may not work for weeks or months
- The need for multiple prescription lens changes
- The need for multiple contact lens refitting appointments

- The financial implications of all the additional optometric follow-up appointments

In most cases, there will be a way to temporarily help the patient with visual rehab until the refraction and the cornea are stable. From there, you can explore long-term vision correction options with the patient (i.e. contact lenses, glasses, etc.)

Intacs® can be a great option for your patients that are struggling with the quality of their vision and can increase their chances of being able to achieve adequate visual function using glasses or contact lenses.⁵ It is important to work with the surgery center team to formulate a plan for your advanced keratoconus patients to help with their short-term recovery and monitor any long-term changes. Corneal ring segments, just the same as cross-linking, are a technology that increases the chances of keeping a patient happy, healthy, and coming back to your office for contacts and glasses rather than ending up with an invasive, medical corneal procedure that brings with it a lifelong risk of possible complications.⁶

References

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