
**VEJARANO PROTOCOL FOR
THE MANAGMENT OF QUERATOCONO
“ SURGICAL TIPS ”**



**PROTOCOLO DE VEJARANO PARA EL MANEJO DEL QUERATOCONO
TIPS QUIRÚRGICOS**

**SURGICAL TIPS, 5
STEPS TO FOLLOW:**

To achieve excellent results in the management of comprehensive treatment for Keratoconus multi technology you should follow these 5 steps:

1. PATIENT DETECTION

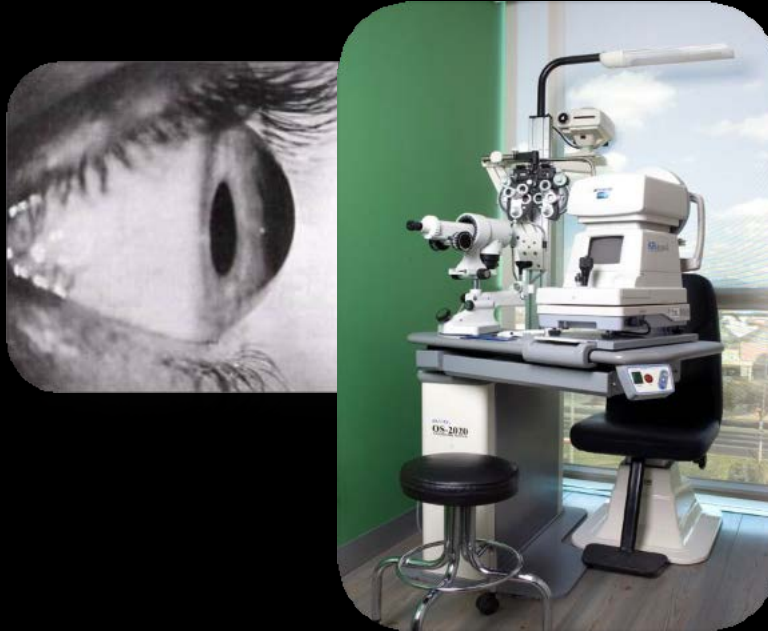
2. PLANNING AND EXECUTION OF SURGERY

3. POST OPERATIVE CONTROL

4. SUPPLEMENTARY TREATMENTS

**5. PROGRESSION OF STABILITY AND NO TRACKING OF
KERATOCONUS.**

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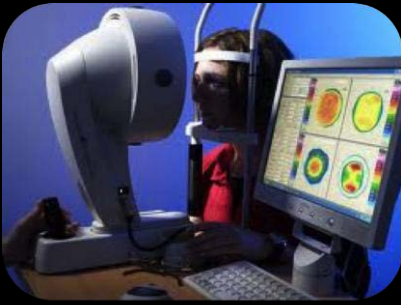


1. PATIENT DETECTION.

To identify the patient with keratoconus we must support the valuation optometric, ophthalmological and complementary studies:

- 1) Optometric Rating: keratometry, autorefractor and subjective.
- 2) Ophthalmological Rating: anterior segment, cornea (see transparency in the visual axis and record opacity or scarring) and crystalline fundus, optic nerve, macula and retina.
- 3) Further Studies:
 - a) Corneal topography type Keratoconus Keratometry flatter curve but with their respective axes and the Aberrometry
 - b) HR Pentacam:
 - We inspect this perfectly taken and say ok.
 - Search Keratometry more curve.
Review index pachymetric to 5 mm. We reviewed 360-5 mm which is the thinnest pachymetry and we record it.

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Initially while is taking experience take the 75% of the stromal thickness to 5mm, once we gain experience takes 90% of the thickness depth pachymetric so that way the rings getting more deeper.

We should use the nomogram Vejarano that ask for different parameters taken from the Pentacam HR:

- Keratometry more curve corresponding axis.
- More flat keratometry axis.
- Pachymetry thinner than 5 mm.
- Autorefractometer.
- Type and location of Keratoconus.

Following these simple steps will get the following information in Nomogram Vejarano:

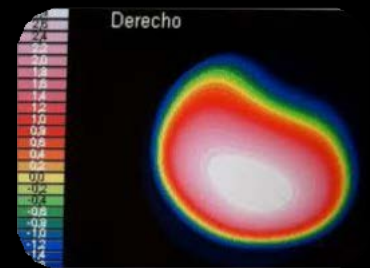
- Exact spot where to cut.
- To what depth should make the incision.
- What kind of rings we use: thickness, grade, type models Keratacx rings.

C. Aberrometry: make emphasis in coma.

D. ORA: Confirm low corneal histéresis and low corneal relaxation factor.

E. OCT Anterior Segment: verify the corneal structure thinning in Keratoconus place.

F. Endothelial Cell Count: verify the amount, it must be over 2000 cells.



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2. PLANNING AND EXECUTION OF SURGERY

It is indispensable take the following precautions without exception:

- 2.1 Always check that the file is suitable for the patient.
- 2.2 Check that the eye that is scheduled on the record is the eye which we will operate.
- 2.3 Verifying the Vejarano nomogram to know what kind of rings we will place, to which axis depth.
- 2.4 Check whether the nurses put the appropriate rings recommended by the Nomograma of Vejarano .



SURGICAL TIPS

- First perform aseptic and antiseptic.
- Put in the eye Sterile fields and the Blepharostat.
- Place the microscope perpendicular or 90 degrees eye.
- We must sit at 90 degrees to the head of the patient.
- Based on the nomogram Vejarano where we take the axis incision.
- Apply topical anesthetic on the cornea.
- With the clock Mendez and marker previously inked Vejarano axis locate the axis of the incision.



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- We must turn our seat to put us in front of the incision site and work more comfortable.
- We ask the patient to look the light microscope and mark the visual axis that is exactly where the light shines in the cornea.
- Use Vejarano's 5 mm inked marker. Position the marker in with the Mendez Marker and match with the cornea's visual axis. The marker's central line should match the axis of the incision.
- The Vejarano's Nomogram will determine the depth of the incision and the 3 incision marks shown by Vejarano's marker.
- Using Vejarano's Diamond Knife, calibrate it at indicated depth .12 . Use Vejarano's Diamond Knife to make the incision on the pre-determined location.
- Repeat topic anesthesia above the cornea.
- Using pre-delaminator of Vejarano we introduce to the bottom of the incision and totally perpendicular or 90°.
- Start by making clockwise and counter clockwise movements to achieve a180° pre delamination.
- Use the Vejarano "Y" Spatula to extend the pre-delamination. Position the spatula vertically with the incision. Immediately insert it horizontally and lengthen the tunnel along the cornea marks.
- Repeat the topic anesthesia above the cornea. Each time we are using the V Glide System we have to be sure the Conjunctive and the cornea are moisturized so the ring can be held in the eye.
- Using the V Glide System position it in limbus and conjunctive. Position the Vejarano's Delaminator above the cornea to make sure the tunnels are created in the correct place. Once the delaminator and marks match, ask the nurse to start the "Low" position. While increasing pressure, make certain the suction ring stays still on the eye. Verify the suction ring and the delaminator stay in alignment.

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- We asked our helper, the delaminator of Vejarano be placed on the cornea and gently rotating enter delaminator of Vejarano, a few millimeters below the spatula in "Y" Vejarano. While one hand we hold the suction ring and the other created the space with Spatula in "Y" to start creating Vejarano tunnel.
- Withdraw Vejarano's "Y" Spatula.
- Begin the delamination with circle movements starting with one side and then the other.
- Make sure the tunnels creation is below corneal marks and the incision hasn't come out of aqueous humor. The nurse must verify the vacuum is maintained in levels closer to 650 Mb.
- We check in Vejarano nomogram, rings to use them out of its case and introduce them into the tunnel verifying that the flat base this down and curve upward. with forceps Vejarano introduce them 75% of the ring into the tunnel and then we'll finish entering with the pusher of Vejarano.
- First introduce the ring and subsequently introduce the contralateral side.
- If we need to move the ring inside the tunnel; use the Vejarano's puller to take them out and Vejarano's pusher to push them in.
- When we the rings are perfectly placed, if necessary, make the suture in the incision spot being carefull to place it as far as possible of limbo to avoid vascularization.
- We buried the point
- Place a neutral soft contact lense and add steroid drops + antibiotic and lubricant.
- Withdraw Blefarostate and estheril fields.
- We place cristal goggles.
- We give indications of the drugs needed for management Post-Operative based in the Vejarano Protocol.
- Give posoperative drugs prescription based on Vejarano's Protocol for Keratoconus treatment.
- Make an appointment for the next day.



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NOTE: Place drops of topical anesthetic or balanced solution on the cornea to keep it moist and transparent as often as necessary during surgery.

3. POP CONTROL

Fundamental piece.

Post OP controls should be done:

- 3.1 Next day.
- 3.2 Next week or 7 days after surgery: remove contact lense and suture.
- 3.3 One Month later or 30 days after surgery: we send patient to contactology for lenses adapatation.
- 3.4 Three months after surgery.
- 3.5 Anual follow up.

At each appointment we need to check the following:

- A. No signs of infection.
- B. No signs of desipetalization.
- C. No signs of Keratitis.
- D. No corneal vascularization towards the rings.
- E. Rings are securely implanted and in the same position. The rings should be confronted , symetric and the same distance visual axis.
- G. Rings are implanted at the same dept.
- H. Determine if the patient has improved sight and is more tolerant to soft or hard contact lenses.

Recommended medications

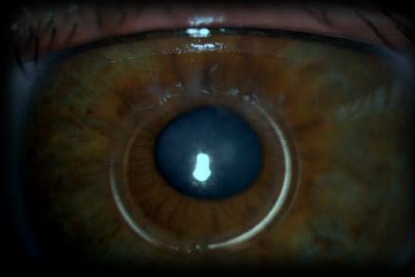
- Steroidal anti inflammatory topical antibiotic +: for 10 days.
- Lubricant topic: for 3 months.
- Topical Antiallergic: every 12 hours for three months.
- Immunomodulator (cyclosporine) topic: every 12 hours for three months.
- Anti-inflammatory nonsteroidal oral tablets: only if pain 3-5 days every six hours.
- Vitamin C (antioxidant) tablets: 1 g daily for 3 months.
- Omega 3 tablets: 1 tablet every 12 hours for three months.



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4.SUPPLEMENTARY TREATMENTS, MULTI TECHNOLOGIC MANAGEMENT.

4.1 Intrastormal ring.

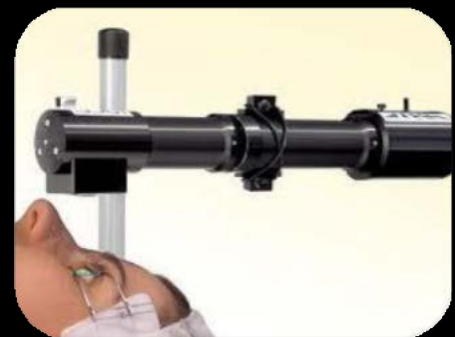


4.2 Cross Linking Application: this procedure is to strengthen the collagen and so the results become permanent and long lasting. It helps prepare the cornea for rings implantation.

In the protocol behavior is normally Vejarano perform Cross Linking three months after introducing the rings.

However, there are some cases that require Cross Linking before the surgery:

- a) If Keratometry is greater than 70 diopters and there is a low histéresis where corneas are very elastic.
- b) In patients where there was complication(s) in first surgery.



With Cross Linking performed 3 months prior to the implantation of the rings along with Vejarano's Delaminator System, the procedure is safe and very effective.

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With Cross Linking, we have to make certain there are no signs of infection or Haze using topic antibiotic and topic steroids for 3 months.

4.3 ICL Phakiq Toric Lenses: they are used to correct the residual defect. In addition, to remove the no dependency to frames or contact lenses once the rings are implantes and Cross Linking performed. Normally, the ICL's should be implanted 6 or 12 months after the Cross Linking has been performed and the patient fulfills the patterns indicated in The Vejarano Nomogram:

- Stability in Keratometry of at least 3 months.
- Stability in subjective, no variation for at least 3 months.
- Patient has a wide anterior chamber of at least 3mm.



As indicated in patients that fulfill Vejarano's Protocol and if the patient wishes to stop using frames or contacts and covers every element The implantation of ICL it's an excellent innovation to help patients by using a multiple techniques for Keratoconus treatment.

To implant phakiq lenses we have to take 2 precautions:

- Retina Laser: 360° by the retinologist to prevent tears and strenghten retina's periphery.
- Make previous iridotomy generally two weeks prior to lens implantation.

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VEJARANO PROTOCOL



Vejarano's Protocol objective for Keratoconus Treatment is to ensure the patients satisfaction. Dr. Vejarano's clinical trials and profesional experience has proven the multi technology treatment offers more advantages, results, and increased patient healhness.

- a) KERATACx Rings implantation using Vejarano Delaminator System.
- b) Cross Linking: 3 months after.
- c) Implantation of Phakiq toric lenses 3 or 12 months after you have obtained stability in the subjective.

Our target is to make sure the Keratometry always be less than 48 diopters, so that way you will always an improved visual accuity and an increased tolerance to frames or contact lenses (if we use Toric ICL). Therefore, the results of visual accuity will always be better.

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To obtain a Keratometry in less than 48 diopters Dr. Vejarano innovating a new ring called Keratacx V Plus with a increased micrón size of of 400, 450, and 500. Even though they are taller in size, you won't have a problem locating them because with the Vejarano Delaminator System, we can create tunnels up to 90% of estromal depth. This way you will obtain better correction and a Keratometry of less than 48 diopters.

5. FOLLOW UP AND NO PROGRESSION OF KERATOCONUS

Once we have obtained excellent results . The next step is to ensure the stability in the rings over time. To be able to do a follow up with a good control it is important to support it with annual studies.

- Pentacam HR
- Corneal Topography
- Aberrometry
- ORA
- Endothelial Count
- OCT of anterior segment
- Analyze anterior segment: crystalline and cornea
- Eye Fundus
- Subjetive
- Autorefractometer
- Complete ophtalmology valuation

Stability: it is the no significant variation, less than a dioptry.

Vejarano protocol tells us that if we see stability in the patient's behavior with their respective observation. annual analysis

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Signs of alarm and progression of the Keratoconus:

Measures we need to be alert to think there might be a progression on Keratoconus and no stability:

- Improve in Keratometry
- Increase in astigmatism and miopic
- Corneal histéresis decrease
- Decrease in visual accuity

In Vejarano´s Protocol for Keratoconus Treatment in the case of progression on the Keratoconus the conduct says it is needed to perform a new Cross Linking on the eye we are seeing progression.

*System Using Delaminator Vejarano
Based on the nomogram Vejarano
Following the verbatim Vejarano Protocol for management
of keratoconus with multi technologies*

*Eliminate complications
Improve your results
Give the best to your patients
Increase your icomes*

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