

**Keraring Implantation Using Keraring Nomogram Versus the Q Value Modified
Nomogram of a Single Keraring Segment Implantation for Treatment of
Keratoconus: a Comparative Study**

Protocol study

Mohammed Iqbal MD¹, Ahmed Elmassry MD², Amani E Badawi MD³

Mouamen M Seleet MD, F.R.C.S. (Glasg.)⁴, Ashraf H Soliman MD, F.R.C.S (Glasg.)⁴,

Mohammed Kabil MD⁴ and Ola m Ibrahim MD⁴

¹Department of Ophthalmology, Faculty of Medicine, Sohag University, Egypt

²Department of Ophthalmology, Faculty of Medicine, Alexandria University, Egypt

³Department of Ophthalmology, Faculty of Medicine, Mansoura University, Egypt

⁴Department of Ophthalmology, Faculty of Medicine, Ain Shams University, Cairo, Egypt.

Corresponding author: Mohammed Iqbal

Department of Ophthalmology, Faculty of Medicine, Sohag University, Sohag, Egypt

Mobile: +2 010 6855 9840

E-mail: dr_m_iqbal@yahoo.com

ORCID ID of the corresponding author: 0000-0002-7954-1277

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INTRODUCTION

Keratoconus (KC) is a disorder of the eye which results in progressive thinning of the cornea.¹⁻³ This may result in blurry vision, double vision, nearsightedness, astigmatism, and light sensitivity.³ Usually both eyes are affected.³ In more severe cases a scarring or a circle may be seen within the cornea.⁴

While the cause is unknown, it is believed to occur due to a combination of genetic, environmental, and hormonal factors.³ About seven percent of those affected have a family history of the condition.³ Proposed environmental factors include rubbing the eyes and allergies.⁴ The underlying mechanism involves changes of the cornea to a cone shape.³ Diagnosis is by examination with a slit lamp.³

Initially the condition can typically be corrected with glasses or soft contact lenses.³ As the disease worsens special contact lenses may be required.³ In most people the disease stabilizes after a few years without severe vision problems.³ In a small number of people scarring of the cornea occurs and a corneal transplantation is required.³

Keratoconus affects about 1 in 2,000 people.^{3,4} It occurs most commonly in late childhood to early adulthood.³ While it occurs in all populations it may be more frequent in certain ethnic groups such as those of Asian descent.⁴ The word is from the Greek *kéras* meaning cornea and the Latin *cōnus* meaning cone.⁵

Improvement in visual acuity and refraction after ICRS implantation is accomplished by a shortening of collagen lamellae along the arc length of the ring. There is a redistribution of corneal stress due to the change in the shape of the cornea after implantation of ICRS.^{11,12}

Keraring is an orthosis implanted in the corneal stroma. It acts upon corneal tissue by altering its central curvature and shape, thus reducing or eliminating morphological irregularities and existing myopia and astigmatism. They are available as 160° segments made of PMMA. They are triangular in cross-section with a 600 micron base and an apical diameter of 5 mm. They come in variable thickness (0.15, 0.20, 0.25, 0.30 and 0.35 mm) in 0.05 mm steps.⁵

The change in the corneal structure induced by any ICRS can be roughly estimated by the Barraquer thickness law; therefore, the outcome achieved is directly proportional to the thickness of the ICRS and inversely proportional to its diameter.^{1, 7, 11}

PURPOSE

To compare the outcomes of implantation of the kerarings according to kera nomogram versus the implantation of a single keraring segment (210 arc) according to the modified Q value nomogram.

PATIENTS AND METHODS

Design: A prospective comparative clinical study.

The author will obtain the approval of the ethical committee in faculty of medicine in Sohag University Hospital and informed consent will be obtained from all patients.

This study will be conducted on 150 eyes with type I, II and III keratoconus. The patients will be divided into 3 groups. Group A will include 50 eyes to be treated with keraring implantation according to keraring nomogram. While group B will include 50 eyes to be treated with single (210 arc) keraring implantation according to the modified Q value nomogram. The patient will followed up for 6 months after surgery. Group C will include KC 50 eyes as control group with matching the same age group and subjected to surgery.

All patients were subjected to complete ophthalmologic examinations that included measurement of the uncorrected visual acuity (UCVA), best spectacle-corrected visual acuity (BSCVA), manifest refraction, slit lamp examination of anterior segment, intraocular pressure measurement and a detailed fundus examination.

patients were subjected to preoperative and postoperative UCVA, BCVA, refraction, Pentacam pachymetry and keratometry examinations at 1, 3 and 6 months follow up period.

The ring segments were chosen based on a nomogram from the manufacturer.

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دراسة مقارنة ما بين استخدام مخطط كيرا التقليدي لزراع حلقات كيرا مع التعديل المستحدث
بالإعتماد على قيمة الكيو لزراع حلقة كيرا واحده لعلاج القرنية المخروطية

بروتوكول

- 1- دكتور محمد إقبال – إستاذ مساعد طب العين – جامعة سوهاج.
- 2- دكتور مؤمن سليط - مدرس طب العين- جامعة عين شمس.
- 3- دكتور اشرف سليمان- مدرس طب العين- جامعة عين شمس.
- 4- دكتور محمد قابيل - مدرس طب العين- جامعة عين شمس.
- 5- دكتور علا عمر - مدرس طب العين- جامعة عين شمس.
- 6- دكتورة أماني بدوى – إستاذ مساعد طب العين – جامعة المنصورة.
- 7- دكتور أحمد المصرى – إستاذ دكتور طب العين – جامعة الأسكندرية.