



# New technique for iridodialysis correction: Single-knot sewing-machine suture

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Iridodialysis is a common occurrence after trauma and can be the source of considerable morbidity for the patients. Several options to repair iridodialysis are described in the literature. We present a new technique—a single-thread single-knot suture. This simple approach does not require special material and uses a single thread and a single knot, avoiding the need for using multiple sutures or placing multiple knots. We used this technique in several patients, and it appears to be an effective alternative to iridodialysis repair.

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 Online Video

Iridodialysis, the avulsion of the iris from its natural insertions on the ciliary body, is usually the result of trauma, either accidental or iatrogenic.<sup>1</sup> It can lead to complaints of photophobia, monocular diplopia, or glare. In addition, it is more difficult to perform surgical interventions that require a stable iris (ie, placing an iris-fixated intraocular lens [IOL]). Several options to restore the anatomy of the iris are available.<sup>2–9</sup> We describe our technique as a single-thread single-knot suture.

## SURGICAL TECHNIQUE

The iris is reattached with a 9-0 nonabsorbable suture (nylon or polypropylene) without a needle, which is

folded in a loop and inserted in a 27-gauge plastic-handled 40 mm straight needle. The folded tip should be carried inside the lumen of the needle and exposed only after puncture of the sclera, with a pushing motion using the free tips of the suture (located behind the hub). After creation of a peritomy adjacent to the iridodialysis site, a clear corneal incision is made 180 degrees opposite from the center of the iridodialysis and an ophthalmic viscosurgical device is injected. The needle that was previously prepared is carefully advanced to reach 1 of the sides of the iris disinsertion (Figure 1, A). After puncture of the iris exterior border with the needle, the needle is led to a position 1.5 mm behind the limbus and the sclera is perforated. A suture loop is retrieved from the tip of the needle with a forceps (Figure 1, B). That loop is secured with an auxiliary anchoring suture (6-0 silk, or other), which passes inside the loop and prevents inadvertent slippage. The needle is recoiled as far as necessary to continue with the suture, not leaving the anterior chamber; the process is repeated, puncturing the iris and sclera as needed, usually at 1 clock-hour intervals. As the needle punctures the limbus, the loops are retrieved and anchored by passing the auxiliary suture through the loops (Figure 1, C). In the last loop, the end of the suture is retrieved and tied to the 1 obtained in the first loop, as the auxiliary suture is removed (Figure 1, D). Therefore, a continuous mattress suture with a single thread and a single knot securing the suture is obtained (Video 1, available at <http://jcrsjournal.org>). The knot is tied carefully to avoid excessive tightness and

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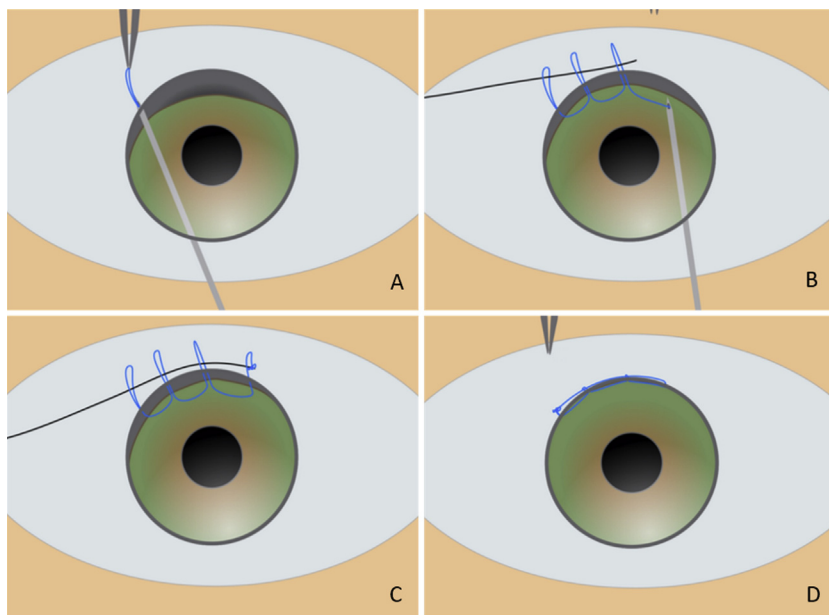
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**Figure 1.** A: Retrieval of the loop from the needle. B: Anchoring of the auxiliary suture. C: Removal of the auxiliary suture, passing the main suture backward to tie at the beginning. D: Final aspect. See text for more details.

covering of the angle. This knot can be positioned in a scleral pocket. The conjunctiva is repositioned with a single absorbable knot or with tissue glue.

## RESULTS

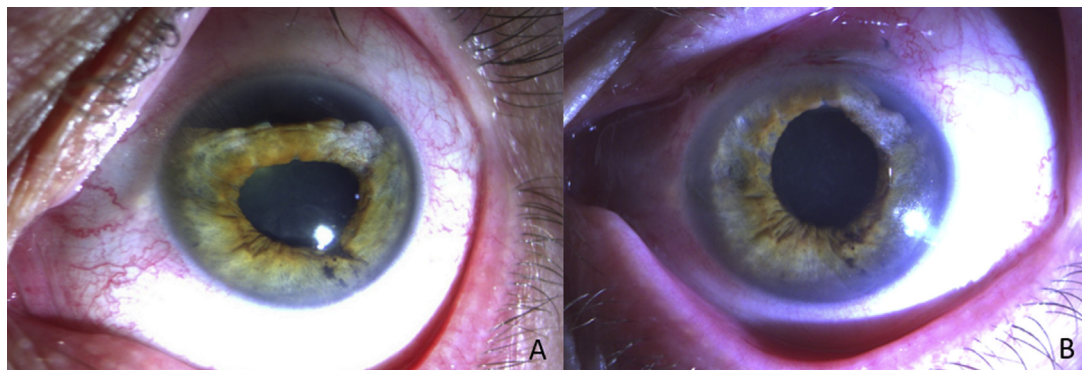
### Case 1

A 60-year-old man was referred to our hospital after blunt trauma to the left eye, with an iridodialysis between the 10 o'clock and 2 o'clock meridians; he had no other significant morbidities. The patient had surgery as described above without complications. The endothelial cell density decreased by less than 5% over the follow-up of 9 months, and the final result was satisfactory, with 20/40 corrected distance visual acuity (CDVA) (Figure 2).

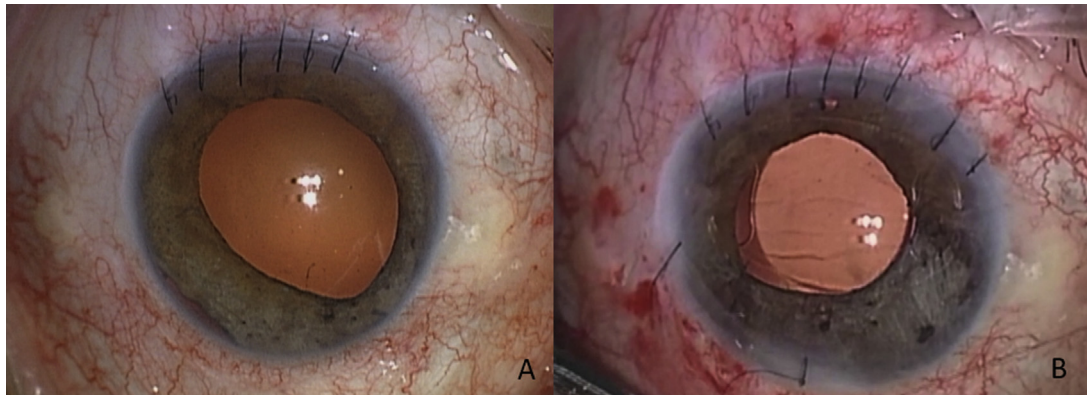
### Case 2

A 61-year-old man came to our emergency room after being hit with a spring in the left eye. He

initially had medical therapy for hyphema and ocular hypertension. The therapy was initiated after exclusion of serious damage to the retina by ultrasound and computed tomography scanning because it was impossible to examine the posterior pole. A globe rupture site was not found. Once the hyphema disappeared, the examination revealed vitreous in the anterior chamber, a traumatic cataract, phacodonesis, and iridodialysis between 6 o'clock and 8:30 o'clock. Three weeks after the accident, the patient had surgery with intracapsular cataract extraction and anterior vitrectomy, without IOL implantation. The second procedure 1 month later aimed to restore the iris anatomy and create support for an iris-fixated IOL (Artisan, Ophtec BV). The iridodialysis was approached as previously described; there was additional pupilloplasty with 2 sliding Siesper knots 180 degrees apart and application of the iris-fixated IOL on the anterior surface of the iris (Figure 3). The surgery and postoperative period



**Figure 2.** Case 1. A: Preoperative status. B: Three months after surgery.



**Figure 3.** Case 2. A: Before second surgery (aphakic; note iridodialysis between 6 o'clock and 8.30 o'clock). B: Immediate postoperative status.

were uneventful, and the result achieved was satisfactory, with 20/25 CDVA.

## DISCUSSION

Iridodialysis usually occurs as a result of blunt trauma, with open-globe trauma and idiopathic (surgical) as less frequent causes. A small (<1 clock hour) superior (~12 o'clock meridian) iridodialysis does not require surgical reconstruction. If it is larger than 1 clock hour or in an inferior, nasal, or temporal position, surgical repair should be attempted for diplopia, photophobia, glare, and glaucoma; an inability to perform additional maneuvers in the iris; or cosmetic deformations.

Several methods to correct iridodialysis—divided into open chamber and closed chamber—have been described. The open-chamber approaches (Paton and Craig<sup>10</sup> and McCannel<sup>11</sup>) fell out of favor, ceding to the closed-chamber methods, such as the one we present. Boxer Wachler and Krueger<sup>9</sup> used a double-armed McCannel suture with 10-0 polypropylene in a 17.0 mm straight needle. Bardak et al.<sup>3</sup> used a 22.0 mm 26-gauge straight needle with a hole 1.0 mm from the tip to insert a 9-0 or 10-0 suture; however, unlike our method, theirs requires several scleral knots and does not use an anchoring suture to secure the loops. Bhende<sup>4</sup> used a method similar to ours, with 8-0 or 9-0 nylon or 10-0 polypropylene threaded inside a 30-gauge needle, burying the knot on a scleral tract. As with our technique, it does not require special equipment and the knots are positioned in a scleral pocket; however, if the iridodialysis is large, it requires multiple knots. Ravi Kumar<sup>A</sup> presented a video at the 2013 Asia-Pacific Association of Cataract & Refractive Surgeons meeting using an approach also described as “sewing-machine.” The main difference was that their technique required multiple knots. Snyder and Lindsell<sup>7</sup> used a “hang-back” approach with a curved

needle to avoid covering the angle, as did Agarwal et al.<sup>2</sup>; however, this group used a 26-gauge needle to engage the iris and guide the suture. We avoided covering the angle by tying the knot carefully to avoid crowding the iris in the angle. Dağlioğlu et al.<sup>5</sup> recommended using an 8-0 polypropylene suture instead of 9-0 or 10-0 suture. Khokhar et al.<sup>6</sup> used a bent 26-gauge needle to lift the peripheral iris and act as a platform for a 9-0 polypropylene suture in a straight needle. Voykov<sup>8</sup> recently described a knotless technique, similar to the one used by Szurman et al.<sup>12</sup> for trans-scleral fixation of IOLs.

Our technique is simple, relatively easy to master, and does not require special equipment. The use of an anchoring suture enables correction of large iridodialysis with a single thread, minimizes manipulation in the anterior chamber, and avoids using multiple scleral knots, potentially decreasing the risk for infection and erosion. One limitation of our technique is that at the time of publication, only a small number of cases resolved after surgery using the technique. Nonetheless, it was effective in correcting iridodialysis and no complications were observed; therefore, it appears to be a valid alternative to the methods described in the medical literature.

### WHAT WAS KNOWN

- Iridodialysis is a common problem after ocular trauma.
- Many options are available for iridodialysis repair.

### WHAT THIS PAPER ADDS

- The new technique was effective in repairing iridodialysis.
- It avoids the use of multiple sutures and knots, potentially decreasing the risks of the procedure.

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**OTHER CITED MATERIAL**

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