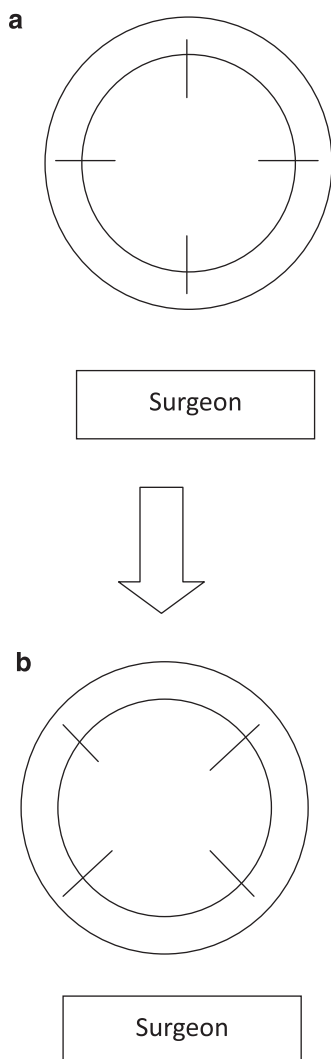


Sir,  
**Cardinal sutures revisited: position modification in corneal transplantation**

Penetrating keratoplasty is traditionally performed using a superior approach, with the four cardinal sutures placed at 12, 3, 6, and 9 o'clock hour positions (Figure 1a).<sup>1</sup> The second cardinal suture is considered to be the most important suture affecting postoperative astigmatism.<sup>2</sup> The areas of donor–host overlap on both sides of the second suture should be equal to ensure even tissue distribution for subsequent suture placement. Ideally, when the four cardinal sutures are properly placed, a diamond-shaped figure should be observed. However, in difficult situations such as narrow palpebral fissures (commonly encountered in the Oriental

population), low scleral rigidity, and high vitreous pressure, one may be forced to secure the donor with relative haste at the expense of suboptimal suturing.<sup>3</sup>

In order to facilitate surgery, especially in the above-mentioned difficult situations, one of the authors (ALY) adopted a modified technique on cardinal suture placement (Figure 1b). In addition to using a temporal approach,<sup>4</sup> all of the cardinal sutures are instead placed in the oblique meridians (45° rotation). The first cardinal suture is placed at either the superior or the inferior temporal quadrant of the eye. The second suture is then secured on the nasal side and at the opposite pole of the eye (namely, inferior and superior, respectively) at 180°. A similar manoeuvre is repeated for the third and fourth sutures at above-90° rotation. In the traditional superior approach, the placement of the nasal and superior cardinal sutures may be difficult, owing to a small palpebral fissure, crowding by a high-bridged nose, or a prominent superior orbital rim.<sup>4</sup> Furthermore, the horizontal meridian sutures are usually the most challenging, as they require most angulations from the surgeon's forearm, wrist, and fingers. The 45° rotation of these four critical sutures should make their placement easier. This modification has been used at our centre over the past few years without any adverse effects. We would like to suggest this modification to junior surgeons (especially in challenging cases) for their consideration. The same rotation is also applicable to other anterior lamellar procedures.



**Figure 1** Schematic representation of (a) the conventional placement of cardinal sutures, and (b) our modified 90° rotation of cardinal sutures (applicable to both the superior and the temporal approach) in relation to the position of the surgeon.

**Conflict of interest**

The authors declare no conflict of interest.

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