White Ring Sign and Sequential Segmental Terminal Lenticular Side Cut Dissection for Uneventful and Complete Lenticular Extraction in SMILE

We wanted to congratulate Ng et al. for describing an effective lenticular hydration technique for identification and extraction of a lenticular remnant after small incision lenticule extraction (SMILE). We also agree with their observation that prevention is the best solution for this condition and we would like to add here two techniques described by one of us (SJ) to facilitate easy extraction and to prevent lenticular tears.

The first is the white ring sign, which prevents unintentional initial posterior dissection and thereby a lenticule adherent to the cap. This sign uses the anteroposterior relationship between the dissecting instrument and the circular light reflex (the white ring) thrown by the lenticular side cut. Anterior dissection should be performed first and this can be confirmed by seeing the instrument in front of the white ring (Figure 1A). This is followed by dissecting the refractive cut or the posterior plane and is confirmed when the white ring is seen over the dissecting instrument (Figure 1B). This technique helps identify unintentional initial dissection posterior to the lenticule.

The second technique is the sequential segmental terminal lenticular side cut dissection. This facilitates complete dissection and prevents lenticular tears by breaking down dissection of the lenticular side cut into small segments while keeping undissected anchored segments on either side to prevent lenticular movement. This is especially useful in thin lenticules where the risk of tearing the lenticule during dissection is higher (Figures 1C and 1D).

REFERENCES

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The authors have no financial or proprietary interest in the materials presented herein.

Figure 1. (A) The white ring from the lenticular side cut is seen forming a complete circle. Instrument seen anterior to the white ring (blue arrow) confirms anterior plane dissection. (B) Instrument seen posterior to the white ring (black arrows) confirms posterior plane dissection. (C) Lack of anchor points in the form of undissected segments of the lenticular side cut can lead to lenticular movement and difficult dissection. (D) After anterior plane dissection, posterior plane dissection is completed without extending through the lenticular side cut, which is left for the end (terminal). The sequence of dissection and the direction of dissection of the lenticular side cut (sequential segmental) is as per the numbered arrows (yellow).
Reply

We thank Drs. Jacob and Agrawal for their valuable comments on our article “Secondary Lenticule Remnant Removal After SMILE,” and describing two additional techniques that helped to facilitate easier lenticular removal and to prevent lenticular tear.

The first technique they described was the white ring sign, which aimed to prevent unintentional initial posterior dissection of the lenticule. We echoed that identifying the wrong plane would be more commonly encountered by the less experienced SMILE surgeon, leading to suboptimal outcomes. We have previously reported on the learning curve of SMILE surgeons. With increasing SMILE experience, the surgeon can often identify the dissection plane more easily and quickly, leading to faster visual recovery, a better safety profile, and more accurate astigmatic correction. For the less experienced, ways to identify the dissection planes such as the described white ring sign would be helpful.

The second technique they described was the sequential segmental terminal lenticular side cut dissection, which reduced the risk of lenticular tear in cases with difficult dissection. In our case series, it was during the posterior dissection when the probe punctured the lenticule button and entered a wrong plane that resulted in incomplete dissection and formation of the lenticular remnant. We agree with Drs. Jacob and Agrawal that by keeping undissected anchored segments on either side to prevent lenticular movement, this counterforce could help prevent lenticular tears during the lenticular side cut dissection.

In fact, for cases with more difficult lenticular dissection, we have recently described another hydroexpression technique. In hydroexpression, instead of using the forceps to remove the lenticule after lenticular dissection, we directly placed an irrigation cannula underneath the lenticule and injected balanced salt solution. The wave of fluid would dissect above and below the lenticule, and the hydrostatic pressure being built up in the stromal cavity would spontaneously express the lenticule out. This technique was particularly helpful in difficult cases where the dissection part was more challenging because the wave of fluid could help to ensure complete separation of the lenticule, just like performing hydrodissection during cataract surgery.

REFERENCES


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doi:10.3928/1081597X-20171222-01