

**Sir,
Vertical rectus transposition in Duane's syndrome: does co-contraction worsen?**

We read with interest the article by Akar *et al.*¹ We would like to make the following observations/queries.

In patients with Duane's retraction syndrome there is some degree of subnormal and some degree of anomalous innervation of the lateral rectus (LR) muscle. The extent and severity of the two may be variable. Presumably, subnormal innervation may lead to deficient abduction and anomalous innervation may lead to co-contraction with globe retraction, palpebral aperture narrowing, or retraction equivalents like upshoots and downshoots.

In their article the authors describe patients of type 1 Duane syndrome to be with esotropia of 20 pd or more, an AHP larger than 20°, limited abduction, and no significant upshoots or downshoots in the adducted position. There is no objective grading used for the measurement of shoots or palpebral aperture changes. Some of these cases may have had retraction or retraction equivalents (shoots) that were not clinically very apparent.

It has been suggested that vertical rectus transposition (VRT) may worsen retraction and shoots.^{2,3} Thus an objective measurement (pre- and postoperative) of palpebral aperture changes and shoots is in order, more so with augmented transposition as in Akar *et al.*¹

Also, the confirmation of absence of anomalous LR innervation pre-operatively is essential. This may be assessed by the Romero-Apis force degeneration test⁴ or, as suggested by some, by electromyography.⁵

It has also been suggested by some that prerequisite to VRT should be the elimination of misinnervation of the lateral rectus by a procedure such as periosteal fixation.⁶

We notice some increase in globe retraction on adduction in Figure 2a; however, it is difficult to comment with only a single photograph. We would like to know from the authors whether they noticed any worsening of retraction or shoots in their patients on follow-up.

In our opinion, VRT in DRS cases should always be performed with the rider that retraction and retraction equivalents may worsen.

Conflict of interest

The authors declare no conflict of interest.

References

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**Sir,
Reply: Vertical rectus transposition in Duane's syndrome: does co-contraction worsen?**

We thank Bhambhwani *et al.*¹ for their remarks, which we shall address in turn. With regard to Bhambhwani *et al.*'s comments on 'Vertical rectus transposition in Duane's syndrome: does co-contraction worsen?' we reported in Table 1 (complications part) that no case had lid fissures narrowing.² For all patients, standardized preoperative and postoperative photographs were taken in the following manner. Photographs were taken at a fixed distance, under identical lighting conditions, with the patient in a sitting position, and with the eyes in primary gaze. The patient's head was placed firmly in the head rest of a slit lamp and the lateral canthal angles were aligned with the side marks. An 18-inch metal bar had been fixed to the head rest of the slit lamp, projecting forward. The camera was held directly beneath the metal bar, moving forward or backward to focus on the patient's lid margins. The patient was asked to fixate on the camera while the uninvolved eye was occluded. Photographs were taken with a digital camera (Cybershot DSC-F828; Sony Electronics Inc, Tokyo, Japan) with a macrolens at a reproduction ratio of 1:4.

Digital image analysis was used to standardize each patient's preoperative and postoperative photographs for accurate objective comparison. Preoperative and postoperative photographs at the final follow-up examination were analyzed for margin-to-reflex distance (MRD), in mm, and used to access eyelid position. Adobe Photoshop version 7.0.1 (Adobe Systems Inc, San Jose, CA, USA) was used to measure the distance (pixels) from the center of the pupil to the upper eyelid margin (MRD₁) and lower eyelid margin (MRD₂), and the corneal diameter. The MRD₁ and MRD₂ were then standardized to an average horizontal corneal diameter (calculated as 11.6 mm in women and 11.7 mm in men), as described previously.^{3,4} There was no statistically significant difference between the preoperative and postoperative standardized MRD (MRD₁ + MRD₂) (independent samples *t*-test) (*P* = 0.652). After vertical rectus transposition surgery (standard or augmented), there was no worse retraction or up- or downshoots.