Trochlea surgery for acquired Brown syndrome

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PURPOSE
To describe surgical treatment of acquired Brown syndrome by trochlea reconstruction and trochlea adhesiotomy.

METHODS
The medical records of patients with acquired Brown syndrome who underwent intraoperative forced duction testing under direct view of the trochlea from 2010 to 2012 were retrospectively reviewed. In all cases, the site of restricted movement was identified, after which either the trochlea was reconstructed or the trochlear adhesion was removed. Surgical results were assessed by means of the pre- and postoperative Hess chart scores and binocular single vision test scores.

RESULTS
Six eyes of 6 patients were included. In 4 patients the trochlea was reconstructed; in 2, the adhesion was removed. A significant improvement in the Hess chart scores was observed postoperatively in 5 of the 6 patients (P = 0.047). Binocular single vision test scores also significantly improved in 4 of 5 patients (P = 0.019). No iatrogenic superior oblique muscle paresis was observed in any of the patients.

CONCLUSIONS
Our technique of isolating the source of limitation of elevation and treating with trochlea reconstruction or adhesion removal successfully treated acquired Brown syndrome in these patients. (J AAPOS 2014;18:56-60)

Brown syndrome is characterized by a limitation of elevation in adduction. Although the cause of Brown syndrome was originally thought to lie within the tissue surrounding the superior oblique tendon, recent studies have shown that the restriction frequently involves the trochlea-tendon complex. The restriction in elevation during adduction can be caused by traumatic, neoplastic, infectious, autoimmune, inflammatory, and iatrogenic processes. Iatrogenic superior oblique palsy has been recognized as a postoperative complication of the surgical treatment of Brown syndrome.

Brown syndrome has been treated with a variety of surgical procedures and materials, including superior oblique tenectomy, superior oblique tenotomy, superior oblique tendon silicone expander, and adjustable nonabsorbable suture spacers. Manipulations of the trochlea have been generally avoided for fear of postoperative complications. However, Mombaerts and colleagues reported their treatment of Brown syndrome with superior oblique luxation and trochlear luxation with a skin incision in the medial upper eyelid crease.

The purpose of this study is to describe our results using a new surgical technique to treat patients with acquired Brown syndrome.

The primary role of the trochlea is to change the vector of the movements produced by the superior oblique muscle and to act as a pulley. Pulleys are also present in the fingers, where, for example, the flexor tendon contracts or stretches to flex or extend the finger. Moreover, several pulleys are located on the palm side at the joints. Functionally, the pulleys prevent the flexor tendon from floating and facilitate the correct gliding of the flexor tendon. Because the function of the trochlea in the orbit and the pulleys in the finger are similar, we believe that the behavior of the superior oblique tendon in the orbit may be similar to that of the flexor tendon in the finger (e-Supplement 1, available at jaapos.org). Inflammation or thickening of an A1 pulley in the trigger finger causes pain and failure of extension and flexion. Loss of the A1 and A2 pulleys produces bowstringing, which causes the flexor tendon to float toward the palm side of the hand. Thus trigger finger is a model of sliding failure of the tendon in the pulley, while bowstringing is a model of pulley loss. In general, the surgical treatment of the trigger finger involves excision of the A1 pulley. Different reconstruction methods are used for bowstringing.

In the present context, it is important to recognize that with trigger finger, the pulley itself is being treated, and thus the lesion location is the focus of treatment. Thus when the lesion location is in the trochlea, the normal superior oblique muscle should not be amputated. Use of a superior oblique tendon silicon expander may be successful in primary gaze; however, because adhesion between the