Surgical Technique for Palsy of Superior Division of Oculomotor Nerve

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Abstract
This report is a description of a new surgical technique for palsy of the superior division of the oculomotor nerve. A 52-year-old female who had previously been operated on for an intracranial tumor described ocular motility restriction. A complete ophthalmological examination revealed elevation deficiency of -4 and accompanying ptosis in the left eye. Botulinum toxin injection was administered, and recession of the inferior rectus muscle, and tucking of the superior rectus following union of the medial and lateral rectus muscles were performed. In our technique, no scleral suture was used during the union of muscles procedure. Postoperatively, elevation improved significantly and hypotropia was fully corrected. In addition to being as effective as the previously described Knapp procedure, our technique is safer and easier.

Keywords: Muscle transposition, superior rectus palsy, superior rectus tucking, sutureless technique.
and -4 is no elevation above primary position. Visual acuity was 1.0 in the right eye and refraction was +0.50. Anterior and posterior segment examination and ocular motility were normal. In the left eye, visual acuity was counting fingers and cycloplegic refraction was +1.50. Biomicroscopic evaluation of the anterior segment showed ptosis of the upper eyelid and posterior segment evaluation revealed optic nerve pallor. Ocular motility was completely restricted in elevation and recorded as -4. Ocular deviation was recorded as 30 prism diopters (PD) of hypotropia in the left eye at both near and distance fixations according to the Krimsky test.

After a botulinum toxin injection, a 7-mm recession of the inferior rectus was performed, followed by surgery that included superior rectus tucking and union of the medial and lateral rectus muscles.

**Surgical Technique**

Conjunctival incision was performed at the limbus between the 4 and 8 o'clock positions, and the medial rectus, lateral rectus, and superior rectus muscles were exposed with dissection. A 6/0 Dacron (Invista North America SARL, Wichita, KS, USA) suture was used to grasp one-seventh width...
of muscle 10 mm posterior to the insertions of the medi-
al and lateral rectus muscles. The muscles were both then
passed with partial and full thickness suture bites. Sutures
were locked and locking bite was also secured with a twist
lock. Approximately 8 to 10 mm posterior to the insertion
of the superior rectus muscle, the medial and lateral rectus
muscles were apposed with the help of the previously placed
6/0 Dacron sutures, tied and locked 3 times (Fig. 2). Scleral
suture was not used at this stage. Then, 8 mm posterior to
the insertion, one-third width of the superior rectus muscle
was grasped centrally using partial and full thickness bites of
6/0 Dacron sutures, plication anteriorly, and sutured to the
sclera 1 mm anterior to the insertion (Fig. 3). Conjunctiva was
closed with 8/0 Vicryl (Ethicon, Inc., Somerville, NJ, USA)
suture.

Postoperatively, elevation improved significantly and hy-
potropia was fully corrected (Fig. 4).

Discussion

Surgical treatment of superior branch of cranial third nerve
palsy depends on the type and severity of the paralysis and
the presence of other associated factors (2).

In the presence of superior rectus palsy, the preferred pro-
cedure is a Knapp transposition.

Knapp reported of 15 patients for whom correction of
hypotropia ranged from 21 to 55 PD, with a mean of 38 PD.

Good results were obtained in 14 of 15 patients (3). Other
authors have found similar rates of correction (4-9).

Mims reported 3 cases of isolated superior rectus palsy
and performed 8 to 9-mm recessions of the antagonist infe-
rior rectus muscle for abnormal head tilt (10). Either Knapp
procedure or augmented modifications (11) eliminate the
hypotropia on effected eye similarly vertical rectus proce-
dures on the fellow eye. But all these procedures needed
many scleral suturations.

In this case, we preferred to perform muscle union sur-
gery prior to the superior rectus application. While per-
forming the transposition and union of the medial and lateral
rectus muscles, we did not use a scleral suture. In addition to
being just as effective as the Knapp procedure with or with-
out augmentation we observed that this technique is easier
and safer than Knapp procedure.

Disclosures

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