The Role of Rectus Muscle Myectomy in the Management of Large Angle Strabismus for Graves’ Ophthalmopathy

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Objective: To investigate the role of rectus muscle myectomy for the treatment of large-angle strabismus in patients with Graves’ ophthalmopathy.

Patients: Forty-seven consecutive patients with Graves’ ophthalmopathy who demonstrated strabismus greater than 25 prism diopters (large-angle strabismus).

Surgical Technique: The surgeries were performed under general anesthesia. After the muscle was isolated and secured with a muscle hook, the inner blade of a Westcott Scissors was inserted under the muscle tendon to a depth of at least 10 mm from the muscle insertion. After enough muscle was collected between the blades of the Westcott Scissors, one snip procedure was done to detach the entire muscle at the muscle belly (Figure). The entire muscle stump was retrieved and removed from the insertion. The conjunctiva was secured to the globe near the muscle insertion. Simultaneous detachment of the capsulopalpebral head was performed with inferior rectus muscle myectomy in order to minimize lower lid retraction.

Main Outcome Measurements: Pre- and postoperative deviation in primary position measured in prism diopters. Functional binocular vision and postoperative deviation of less than 5 diopters are considered as successful surgical outcomes.

Results: Forty-seven patients underwent rectus muscle myectomy for the correction of large-angle strabismus related to Graves’ disease. A summary of the types of surgical procedures is listed in Table 1. The majority (85.1%) of patients received single muscle myectomy. Three (6.4%) of the patients received myectomy of two muscles and two (4.3%), three muscles. Two patients received recession procedure on one additional muscle (both were on medial rectus).

Postoperatively, 78.7% of patients reported no diplopia. Of the 10 patients who had persistent diplopia, 7 (70%) had under-correction of the deviation, while 3 (30%) had overcorrection. (Table 2)

Seven patients opted to receive a second operation. Of the re-operated patients, four of six under-corrected cases (66.7%) underwent re-detachment of the same muscles while the remaining two received myectomy of the agonist in the fellow eye.

Myectomy of the antagonist in the same eye was performed in one case with over-correction. (Table 1) The overall success rate for the second surgery was 85.7%. The surgical success after re-detachment was 75%. The overall success rate after the second surgery was 91.5%.

Forty patients were included in the calculation of the effectiveness of myectomy of a single restricted muscle. Only those who achieved no diplopia after a single muscle myectomy were included for statistics. Patients with additional recession of one or more muscles were excluded from the calculation. The mean correction of deviation with a single muscle myectomy was 34.3 ± 7.7 PD, ranging from 26 to 60 PD. All three groups of muscles had similar postoperative correction after myectomy. The most commonly operated single muscle was inferior rectus (30 cases), followed by medial rectus (6 cases) and superior rectus (4 cases).

The mean preoperative exophthalmos was 17.7 ± 2.1 mm. Postoperative exophthalmos was averaged 17.4 ± 1.9 mm. The differences had no statistical significance.

Conclusions: The complete rectus muscle myectomy technique is effective and predictable in the treatment of large-angle strabismus in patients with Graves’ ophthalmopathy.