ARTICLES FOR THE 2018 RESEARCH COMMITTEE WORKSHOP


   Efficacy and Adverse Effects of Atropine in Childhood Myopia: A Meta-analysis.

   Gong Q¹, Janowski M², Luo M³, Wei H⁴, Chen B⁴, Yang G⁴, Liu L⁴.

   Abstract

   Importance:

   Some uncertainty about the clinical value and dosing of atropine for the treatment of myopia in children remains.

   Objective:

   To evaluate the efficacy vs the adverse effects of various doses of atropine in the therapy for myopia in children.

   Data Sources:

   Data were obtained from PubMed, EMBASE, and the Cochrane Central Register of Controlled Trials, from inception to April 30, 2016. The reference lists of published reviews and clinicaltrials.gov were searched for additional relevant studies. Key search terms included myopia, refractive errors, and atropine. Only studies published in English were included.

   Study Selection:

   Randomized clinical trials and cohort studies that enrolled patients younger than 18 years with myopia who received atropine in at least 1 treatment arm and that reported the annual rate of myopia progression and/or any adverse effects of atropine therapy were included in the analysis.

   Data Extraction and Synthesis:

   Two reviewers independently abstracted the data. Heterogeneity was statistically quantified by Q, H, and I² statistics, and a meta-analysis was performed using the random-effects model. The Cochrane Collaboration 6 aspects of bias and the Newcastle-Ottawa Scale were used to assess the risk for bias.

   Main Outcomes and Measures:

   The primary outcome was a difference in efficacy and the presence of adverse effects at different doses of atropine vs control conditions. The secondary outcomes included
the differences in adverse effects between Asian and white patients.

Results:

Nineteen unique studies involving 3137 unique children were included in the analysis. The weighted mean differences between the atropine and control groups in myopia progression were 0.50 diopters (D) per year (95% CI, 0.24-0.76 D per year) for low-dose atropine, 0.57 D per year (95% CI, 0.43-0.71 D per year) for moderate-dose atropine, and 0.62 D per year (95% CI, 0.45-0.79 D per year) for high-dose atropine (P < .001), which translated to a high effect size (Cohen d, 0.97, 1.76, and 1.94, respectively). All doses of atropine, therefore, were equally beneficial with respect to myopia progression (P = .15). High-dose atropine were associated with more adverse effects, such as the 43.1% incidence of photophobia compared with 6.3% for low-dose atropine and 17.8% for moderate-dose atropine (χ² = 7.05; P = .03). In addition, differences in the incidence of adverse effects between Asian and white patients were not identified (χ² = 0.81; P = .37 for photophobia).

Conclusions and Relevance:

This meta-analysis suggests that the efficacy of atropine is dose independent within this range, whereas the adverse effects are dose dependent.

PMCID: PMC5710262 [Available on 2018-06-08]
PMID: 28494063 [Indexed for MEDLINE]
Intraoperative Findings in Consecutive Exotropia with and without Adduction Deficit.

Hatt SR, Leske DA, Jung JH, Holmes JM.

Abstract

PURPOSE:

Consecutive exotropia may be associated with limited adduction, which has been reported to be caused by 1 or more anatomic abnormalities of rectus muscles or their insertions. We studied the relative frequency of grades of adduction deficit and the relative frequency of abnormal anatomic findings.

DESIGN:

Retrospective cohort study.

PARTICIPANTS:

Patients undergoing surgery for consecutive exotropia.

METHODS:

Preoperative duction deficits were graded on a -5 (severe limitation) to 0 (normal) scale. Operative reports were reviewed to classify intraoperative factors: (1) medial rectus muscle attachment type (normal, abnormal [slipped or stretched scar], attached to pulley, behind pulley, or mixed [a tenuous normal attachment, but with muscle fibers also attached to the pulley or behind the pulley]), (2) medial rectus muscle distal fiber location (millimeters from original insertion), and (3) lateral rectus muscle tightness (normal, mild restriction, moderate restriction).

MAIN OUTCOME MEASURES:

Relationship of grade of adduction deficit to each intraoperative factor.

RESULTS:

Of 143 eyes, 124 (87%) had an adduction deficit. Eyes with abnormal (n = 23), pulley (n = 9), behind pulley (n = 8), or mixed (n = 7) attachments had worse adduction deficits than normal attachments (n = 96; P < 0.02). There was a significant correlation between distal medial rectus muscle fiber location (0-19.5 mm recessed) and grade of adduction deficit (P < 0.0001). Eyes with mild or moderate lateral rectus muscle tightness on forced duction testing (n = 48/143 eyes) had worse adduction deficits than eyes without tightness (P < 0.001). Nevertheless, despite overall correlation, there was considerable individual variability. For example, for -1 and -2 adduction deficits, medial rectus muscle attachment could be at the pulley, behind the
pulley, or include the pulley (19/87 eyes [22%]), and the lateral rectus muscle was tight in 36 of 87 eyes (41%).

CONCLUSIONS:

Adduction deficits are common in patients with consecutive exotropia. Overall, more severe preoperative adduction deficits are associated with medial rectus muscle insertion abnormalities and abnormal forced ductions, but frequently there are exceptions. Severe medial rectus muscle insertion abnormalities, including lost muscles, may be found despite mild preoperative adduction deficits.

Copyright © 2017 American Academy of Ophthalmology. Published by Elsevier Inc. All rights reserved.

PMCID: PMC5440204 [Available on 2018-06-01]
PMID: 28238457 [Indexed for MEDLINE]
Abstract

PURPOSE:
To evaluate the effects of 0.1% topical tacrolimus alone or in combination with steroids for the treatment of shield ulcers and corneal epitheliopathy in patients with refractory allergic ocular diseases.

DESIGN:
Open cohort study.

PARTICIPANTS:
Patients with refractory allergic conjunctivitis epitheliopathy, shield ulcers, or corneal plaques (N = 791).

METHODS:
The 791 patients were treated with topical tacrolimus alone or in combination with topical or oral steroids. The effectiveness of the treatments was determined by a corneal epitheliopathy score during the 3-month follow-up period. The clinical signs were rated on a 4-grade scale. Corneal epitheliopathy with no corneal staining was graded as 0, and shield ulcers or plaques were graded as 3, the highest grade. The effects of tacrolimus with and without topical steroids on the epitheliopathy scores were assessed after adjustments for the severity of the clinical signs and characteristics.

MAIN OUTCOME MEASURES:
Changes in the corneal epitheliopathy score.

RESULTS:
Adjusted mean epitheliopathy score at the baseline was 1.73 (95% confidence interval [CI], 1.65-1.81) for patients treated with tacrolimus alone, and this was
significantly reduced by -0.93 at 1 month. The reduction of the score by topical and oral steroids was -0.02 for fluorometholone, 0.02 for betamethasone, and -0.02 for oral steroids, and these reductions were not significant compared with the reduction effect of topical tacrolimus alone at -0.93. The 238 patients with shield ulcer (score 3) were analyzed with adjustments, and the mean epitheliopathy score at 1 month was reduced to 1.38 with tacrolimus alone (95% CI, 1.24-1.51), 1.41 (95% CI, 1.26-1.56) with adjuvant fluorometholone, and 1.46 (95% CI, 1.32-1.61) with adjuvant betamethasone. No significant difference was observed in the adjunctive topical steroids. The presence of severe palpebral conjunctival symptoms, including giant papillae, was a significant resisting factor for topical tacrolimus.

CONCLUSIONS:

The significant effects of topical tacrolimus alone on shield ulcers and corneal epitheliopathy suggest that it may be used without the need for steroids.

Copyright © 2016 American Academy of Ophthalmology. Published by Elsevier Inc. All rights reserved.

Free Article
PMID: 28017421 [Indexed for MEDLINE]
Ranibizumab Injection as Primary Treatment in Patients with Retinopathy of Prematurity: Anatomic Outcomes and Influencing Factors.

Huang Q¹, Zhang Q¹, Fei P¹, Xu Y¹, Lyu J¹, Ji X¹, Peng J¹, Li YA¹, Zhao P².

Abstract

PURPOSE:

To investigate the anatomic outcomes and influencing factors of ranibizumab in the treatment of retinopathy of prematurity (ROP).

DESIGN:

Retrospective case series.

PARTICIPANTS:

A total of 283 eyes of 145 patients with type 1 ROP treated with intravitreal injection of ranibizumab (IVR) as primary treatment.

METHODS:

Retrospective review of infants who were diagnosed with type 1 ROP and accepted IVR (0.25 mg/0.025 ml) as primary treatment from January 2012 to August 2015. The anatomic outcomes and the influencing factors were analyzed.

MAIN OUTCOME MEASURES:

Anatomic outcomes of ROP eyes after IVR and the influencing factors.

RESULTS:

A total of 283 eyes of 145 patients were included in this study. There were a total of 266 eyes (94.0%) in the positive response group and 17 eyes (6.0%) in the negative/no response group after IVR. Within the positive response group, 139 eyes (48.6%) were in the regression without reactivation subgroup, and 127 eyes (44.9%) were in the regression with reactivation subgroup. A total of 152 eyes received additional laser or surgical treatment. At the last visit, 278 eyes (98.2%) had attached retinas, and 5 eyes (1.8%) had retinal detachment. A classification tree model showed that for patients with gestational age (GA) ≤29.5 weeks, the possibility of experiencing reactivation after IVR is higher than that of those with GA >29.5 weeks (61.6% vs. 29.6%). Moreover, for patients with GA ≤29.5 weeks, those diagnosed with zone II stage 2+ ROP have a lower possibility of experiencing reactivation than other patients (37.9% vs. 80%).
CONCLUSIONS:

Intravitreal injection of ranibizumab seemed to be effective in treating patients with ROP. After treatment, there were primarily 3 different outcomes. Our predictive tree model is helpful for ophthalmologists to evaluate the risk of reactivation.

Copyright © 2017 American Academy of Ophthalmology. Published by Elsevier Inc. All rights reserved.
PMID: 28412066 [Indexed for MEDLINE]
Magnetic Oculomotor Prosthetics for Acquired Nystagmus.


Abstract

PURPOSE:

Acquired nystagmus, a highly symptomatic consequence of damage to the substrates of oculomotor control, often is resistant to pharmacotherapy. Although heterogeneous in its neural cause, its expression is unified at the effector-the eye muscles themselves-where physical damping of the oscillation offers an alternative approach. Because direct surgical fixation would immobilize the globe, action at a distance is required to damp the oscillation at the point of fixation, allowing unhindered gaze shifts at other times. Implementing this idea magnetically, herein we describe the successful implantation of a novel magnetic oculomotor prosthesis in a patient.

DESIGN:

Case report of a pilot, experimental intervention.

PARTICIPANT:

A 49-year-old man with longstanding, medication-resistant, upbeat nystagmus resulting from a paraneoplastic syndrome caused by stage 2A, grade I, nodular sclerosing Hodgkin's lymphoma.

METHODS:

We designed a 2-part, titanium-encased, rare-earth magnet oculomotor prosthesis, powered to damp nystagmus without interfering with the larger forces involved in saccades. Its damping effects were confirmed when applied externally. We proceeded to implant the device in the patient, comparing visual functions and high-resolution oculography before and after implantation and monitoring the patient for more than 4 years after surgery.

MAIN OUTCOME MEASURES:

We recorded Snellen visual acuity before and after intervention, as well as the amplitude, drift velocity, frequency, and intensity of the nystagmus in each eye.

RESULTS:

The patient reported a clinically significant improvement of 1 line of Snellen acuity
(from 6/9 bilaterally to 6/6 on the left and 6/5-2 on the right), reflecting an objectively measured reduction in the amplitude, drift velocity, frequency, and intensity of the nystagmus. These improvements were maintained throughout a follow-up of 4 years and enabled him to return to paid employment.

CONCLUSIONS:

This work opens a new field of implantable therapeutic devices-oculomotor prosthetics-designed to modify eye movements dynamically by physical means in cases where a purely neural approach is ineffective. Applied to acquired nystagmus refractory to all other interventions, it is shown successfully to damp pathologic eye oscillations while allowing normal saccadic shifts of gaze.

Copyright © 2017 American Academy of Ophthalmology. Published by Elsevier Inc. All rights reserved.

PMCID: PMC5609850 Free PMC Article
PMID: 28651813 [Indexed for MEDLINE]
Reduced surgical success rate of rectus muscle plication compared to resection.

Alkharashi M¹, Hunter DG².

Abstract

PURPOSE:

To evaluate the surgical success of rectus muscle plication compared to resection and to compare the short- and long-term changes in ocular alignment after both procedures.

METHODS:

The medical records of all patients who underwent a rectus muscle tightening procedure (resection or plication) at a single institution over a 5-year period by a single surgeon were reviewed retrospectively. Binocular alignment was recorded before and immediately after surgery and again at 6-12 weeks and final follow-up visit. Primary outcome was surgical success rate, defined as distance alignment of \( \leq 10^\Delta \) for horizontal and \( \leq 6^\Delta \) for vertical strabismus. Secondary outcomes were reoperation rate and postoperative alignment drift.

RESULTS:

A total of 72 surgeries were identified for inclusion: 48 resections and 24 plications. Surgical success was significantly higher in the resection group than in the plication group (89% vs 58%; \( P = 0.005 \)) at both 6-12 weeks' follow-up (\( P = 0.005 \)) and at mean final follow-up of 19 ± 13 months (range, 3-56 months [\( n = 48 \); \( P = 0.03 \)). Reoperations were performed in 3 patients in the plication group (12.5%), all for undercorrection; there were no reoperations in the resection group (\( P = 0.03 \)).

CONCLUSIONS:

Rectus muscle plication has many potential advantages over resection, including sparing of the ciliary circulation. In our experience, however, patients treated with plication had lower surgical success rates and a higher reoperation rate. Surgeons should monitor their long-term results before considering plication as their procedure of choice over resection.

Copyright © 2017 American Association for Pediatric Ophthalmology and Strabismus. Published by Elsevier Inc. All rights reserved.

PMID: 28536013