

The Number of Placebo Controlled, Double Blind, Prospective, and Randomized Strabismus Surgery Outcome Clinical Trials: None!

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Editor

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Recently a colleague of mine asked if I knew of any placebo controlled, double blind, prospective and randomized strabismus surgery outcome clinical trials (RCT). Are there one or more clinical trials that note the efficacy of strabismus surgery? This is an important question to ask for several reasons. One reason is that allopathic medicine continues to insist that optometry must have clinical trials completed before we can conduct optometric vision therapy for our patients with binocular vision anomalies and/or learning related vision problems. The second reason is that if our ophthalmology (OMD) colleagues require us to have such evidence based treatment, then it

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must follow that they have many such clinical trials to support the surgical intervention of a child with strabismus and that these clinical trials reflect the highest level of evidence based medicine. Finally, the most important reason is that if we refer a patient for surgical intervention, it would be most appropriate to have evidence based research supporting this surgical intervention.

Unfortunately when my colleague asked me about supporting clinical trials for the efficacy of strabismus surgery, I had to tell him that I did not know of any clinical trials offhand, but would see what I could find out. I then went to PubMed and conducted a literature search for placebo controlled, double blind, prospective and randomized strabismus surgery outcome clinical trials ... and found none!

I did find articles about globe perforation during strabismus surgery,¹ strabismus surgery for convergence insufficiency exotropia² (a retrospective, small sample study), and a long-term study of surgical success for exotropia after ten years³ (197 patients underwent surgery, only 50 could be found for follow-up ten years later. Sixty-two percent achieved a fair or poor outcome after ten years). As I continued my search I also found a study on sensory outcomes⁴ where they found that the majority of children had no change in stereopsis after surgery with only four children demonstrating improved stereopsis, six losing stereopsis and one individual even requiring a second surgery.

None of these studies were placebo controlled, double blind, prospective and randomized strabismus

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surgery outcome efficacy clinical trials. So far, even after doing a fairly extensive literature search, I could not tell you the single best surgical methodology for exotropia, esotropia, or any other kind of tropia you might name.

My next step was to visit Cochrane Reports. There I found three reports that looked at various aspects of strabismus surgery outcomes. These reports evaluated adjustable versus non-adjustable sutures for strabismus,⁵ Botulinum toxin for the treatment of strabismus,⁶ and interventions for intermittent exotropia.⁷

Adjustable versus Non-adjustable Sutures for Strabismus. In this review¹ Haridas and Sundaram note that they did not find any studies that met the inclusion criteria for their review, however, they did look at the results of non-randomized studies that compared these techniques. The author concluded that: *No reliable conclusions could be reached regarding which technique (adjustable or nonadjustable sutures) produces a more accurate long-term ocular alignment following strabismus surgery or in which specific situations one technique is of greater benefit than the other. High quality RCTs are needed to obtain clinically valid results and to clarify these issues. Such trials should ideally a) recruit participants with any type of strabismus or specify the subgroup of participants to be studied ... b) randomize all consenting participants to have either adjustable or non-adjustable surgery prospectively; c) have at least six months of follow-up data; and d) include re-operation rates as a primary outcome measure.*

Botulinum Toxin for the Treatment of Strabismus. Rowe and Noonan² found four RCTs that were eligible for inclusion. Two of these found no difference between the use of botulinum toxin and surgery for patients requiring retreatment for acquired esotropia or infantile esotropia. There was no evidence for a prophylactic effect in an article discussing an acute onset sixth nerve palsy, and that botulinum toxin had a poorer positive outcome than surgery in patients without binocularity with horizontal strabismus. Unfortunately there was a fairly high rate of complications that included ptosis and induced vertical deviations that ranged from 24% of the population in a trial using Dysport™ to 52.17% and 55.54% in trials using Botox.™

The authors concluded that the research in this area primarily consists of retrospective studies, cohort studies or case reviews. The four RCTs that have been completed have shown variable responses ranging from a lack of evidence for prophylactic effect of botulinum toxin in acute sixth nerve palsy, to poor response in patients with horizontal strabismus, to no difference in response in patients that required retreatment for acquired esotropia or infantile esotropia. They also stated that it was not possible to establish information regarding dose effect and that complication rates were high.

Surgical Interventions for Intermittent Exotropia. I have, upon occasion, referred patients for surgical consults when the angle of the strabismus is large so that optometric vision therapy can more readily be utilized as a treatment modality. In this review, Hatt and Gnanaraj³ tried to find randomized controlled trials of any surgical or non-surgical treatment for intermittent exotropia. They found one RCT that was eligible for inclusion. They report that the current literature is mainly retrospective case reviews and are difficult to interpret and analyze. The one randomized trial found noted that unilateral surgery was more effective than bilateral surgery. Unfortunately, any measure of severity was lacking which meant that the criteria for intervention were poorly validated. There also appears to be no reliable natural history data as well.

Most of us have one or more outstanding ophthalmic surgeons that we refer to for surgical intervention of strabismus from time to time. I have even had one or more of my OMD colleagues send these referrals back to me for additional optometric vision therapy before they would consider surgical intervention! These are surgeons who appreciate optometry's role in the care of patients with strabismus. These are also the very same surgeons who tend to have excellent surgical outcomes most of the time.

As was noted in my last editorial, *Mistakes Were Made (Yes by You)*,⁸ David Hunter, MD, PhD, in his article, *Do We Need Evidence for Everything?*, stated that "There is no randomized, controlled trial supporting the contention that evidence-based research is beneficial ... Systemic reviews have severe limitations of scope and reach ... real patients bring with them an

“ ... [There] ... are surgeons that appreciate optometry's role in the care of patients with strabismus ...

abundance of messy heterogeneity...[and]... Medical training is as much an apprenticeship as it is an education and medicine as much a craft as it is an art.”

When it comes to the surgical intervention of strabismus, I hope medicine crafts its surgical art so that the patients’ outcomes yield higher success rates, fewer complications ... and yes, one or more evidenced based, placebo controlled, double blind, prospective and randomized strabismus surgery outcome efficacy clinical trials.

Endnotes

- 1 Rathod D, Goyal R, Watts P. A survey of the management of globe perforation during strabismus surgery in the United kingdom Strabismus. 2011 Jun;19(2):63-6.
- 2 Yang HK, Hwang JM. Surgical Outcomes in Convergence Insufficiency-Type Exotropia. *Ophthalmology*. 2011 Apr 5. [Epub ahead of print].
- 3 Pineles SL, Ela-Dalman N, Zvansky AG, Yu F, Rosenbaum ALJ. Long-term results of the surgical management of intermittent exotropia AAPOS. 2010 Aug;14(4):298-304.
- 4 Morrison D, McSwain W, Donahue S Comparison of sensory outcomes in patients with monofixation versus bifoveal fusion after surgery for intermittent exotropia. *J AAPOS*. 2010 Feb;14(1):47-51.
- 5 Elliott S, Shafiq A. Interventions for infantile esotropia. *Cochrane Database of Systematic Reviews* 2005, Issue 1. Art. No.: CD004917. DOI:10.1002/14651858.CD004917.pub2.
- 6 Rowe FJ, Noonan CP. Botulinum toxin for the treatment of strabismus. *Cochrane Database of Systematic Reviews* 2009, Issue 2. Art. No.: CD006499. DOI:10.1002/14651858.CD006499.pub2.
- 7 Hatt SR, Gnanaraj L. Interventions for intermittent exotropia. *Cochrane Database of Systematic Reviews* 2006, Issue 3. Art. No.: CD003737. DOI:10.1002/14651858.CD003737.pub2.
- 8 Maino D, Mistakes were made (Yes by you!). *Optom Vis Dev* 2011;42(2):66-69. Available from http://www.covd.org/Portals/0/OVD/42-2/OVD%2042-2%20Journal_MainoEditorial_we.pdf. Last accessed 7/11

Acknowledgements

Thank You Dr. Taub

I am both sad and happy to report that OVD’s Assistant Editor, **Dr. Marc Taub**, will no longer be our assistant editor. He is now the editor of our sister publication, *Journal of Behavioral Optometry*. I’m sad about him leaving us as our assistant editor, but happy that he will be staying on as a member of our Journal Review Board. Marc has been the coordinating force behind many of the special theme issues of OVD and a great personal resource for me in all things OVD. I wish Dr. Taub all the best in his new position.

Welcome Dr. Bonilla-Warford

I’m also happy to report that **Dr. Nathan Bonilla-Warford**, better known as the supreme social media guru of optometry, will be assuming a new position with OVD as our Associate Editor. He will be taking on many of the activities that Dr. Taub did and then some. I’m sure Nate will devise even better ways to get the word out about OVD using social media than we have already established.

Please congratulate both of these fine doctors the next time you see them!

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