

WWW 2 – Season 2



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1. How should the side gaze measurements be evaluated in the cases where the near shift is more than the distance?

LC: I think this Q may be tied to Q7 below? The N-D disparity does not predict what you will measure in side gazes. The cause of the N-D disparity in both convergence excess ET and divergence excess XT is frequently accommodation-related, so doing side gazes at distance is more accurate as accommodative influences are better controlled for.

YS: Side gaze measurements are performed for distance viewing.

MP: I do not measure side gaze at near, only distance.

JZ: I would still perform the side gaze measurements for distance fixation. When the patient has both side gaze reduction and a near/distance disparity they should be seen as separate entities, and the surgeon will have to consider the role of each when they do their surgical planning.

JF: I only measure the deviation in eccentric gaze for a distance target, even if the near angle in primary exceeds the distance one.

2. Jocelyn: I grasp the value of prism fusion ranges in patients with BSV and intermittent strabismus, but what about patients with BSV and a CONSTANT strabismus? Do you attempt measurement of fusion ranges with a neutralizing prism?

LC: By definition, a patient with constant strabismus does not have BSV in free space. The best way to test their fusion range is to put them on the synoptophore where you can eliminate the deviation and test their amplitudes. Without this device, it becomes a bit more complicated. Some people put up a neutralizing prism over the deviating eye (20 baseout for an ET20), and then put increasing prisms up over the fixing eye. Remember, though, that a report of a single image in this situation can be the result of 2 things: fusion OR suppression. So, you will need to incorporate something else, like a red filter using a light for your target (but then accommodation is not controlled) or do the Worth 4 Dot during the prism test to ensure that a single image is a sensory fusion response. If not using the W4D as an adjunct, additionally you must closely observe the eyes to ensure that they are making a continual vergence response to the increasing prism, indicating motor fusion.

JZ: If the patient is diplopic with their constant deviation, yes, correct the diplopia and test the ranges. It's likely that underlying poor ranges contributed to their decompensation.

For suppressing patients, when you perform the post op diplopia test, you are looking for an area of fusion, which is much the same as correction the angle and then testing the range.

For example, if your patient with NRC has ET 25 both near and distance, you would start with 20 PD over the deviated eye and ask what they see. If they respond that they see one light, the quick addition of a red filter over the deviated eye would allow you to find out if they were suppressing (the light stays white), or fusing (the light turns pink).

Repeating this with increasingly large prisms until the fusing patient reports suppression or diplopia shows you the range of fusion. If this patient reports fusion with 20-40 PD of correcting prism, you could assume they have 5 PD of divergence and 15 PD of convergence.

JF: As Linda mentioned during the webinar it is difficult to control for suppression in this situation.

3. In a patient with 6/12 in both eyes with glasses and alternating exotropia, can we straight away go to surgery??

LC: You haven't said why the vision is reduced in both eyes. Ametropic amblyopia perhaps? Maculopathy? If an appropriate diagnosis for VA deficit has been established, then you can move to XT surgery.

YS: this depends on the control of the deviation, is it constant or intermittent, and the age of the patient. What is your goal of surgery? Is this a sensory XT? Is it a well-controlled X(T) in a young child? If they already wear glasses, you could consider over-minus glasses (if they are already myopic).

MP: would need more information about patient (age, control, stereopsis).

JZ: If this patient is under 3 years old, then their acuity is within normal limits. Time is a critical component in achieving a functional outcome. If this is the patient's acuity after refractive adaptation, the acuity should not stop them from going to surgery. If a refraction has not been performed, it needs to be done preop and measurements retaken for accuracy if glasses are prescribed.

JF: if you are talking about a case of intermittent exotropia, I would need much more information than this to determine whether to proceed with surgery. In the UK we use the Newcastle Control score which is a 9 points scale that includes parental observations of the deviation, the degree of control for near and a distance target, as a guide to help decide which patients are likely to benefit from surgery.

4. What about patch treatment for intermittent XT? If there is control of the deviation, should patching be done?

LC: While some clinicians have great success with patching therapy as a front-line treatment for X(T), I'm not one of them. It has the best chance of impact in smaller angles e.g. < 20 PD. While occasionally I get a moderate reduction in the angle, I have had only 1 case over my career where it was completely eliminated. I can achieve improved control with patching, but I find once I get them off the patch, they seem to revert back to poor control. And it can be difficult to convince families to commit to 6 hrs. of daily occlusion for up to 6 months, esp. in a school aged child. I use this therapy more as a temporizing measure (e.g. parents not ready to have surgery yet but want to do "something" to help).

YS: I rarely patch for X(T). If the control is good, I don't patch. If the control is poor, we discuss surgery, occasionally over-minus glasses.

MP: if there is amblyopia present, I will patch to try and improve the vision and control, or in a young patient with a strong fixation preference, I will patch.

JZ: PEDIG has a couple of randomized studies that show that there may be benefit from occlusion for antisuppression. A review by Piano and O'Connor notes that the studies they compiled also show benefit. What we don't know yet is how to identify the patients who will respond positively, so we should give everyone the benefit of the doubt and try it.

References:

Piano M, O'Connor A. "Conservative management of intermittent distance exotropia: A review". AOJ 2011; 61:103-116.

Joyce, KE et al. "A systematic review of the effectiveness of treatments in altering the natural history of intermittent exotropia." BJO 2015; 99: 440-450.

Holmes J. "Current nonsurgical management of intermittent exotropia." AOJ 2016; 66: 42-48

JF: although PEDIG studies have proven the efficacy of patching as a treatment for IDEX I, nor very few other UK surgeons, will patch a child with IDEX, unless they have a strong fixation preference and are showing signs of developing amblyopia.

5. When the value of the post-op diplopia test is exceeded, sometimes diplopia is not observed. Your experience?

LC: Absolutely, you can overcorrect the measured deviation with prisms and the patient may never report diplopia. They have significant suppression, and although never impossible, it is highly unlikely they will experience diplopia post-op. This is a fairly common response to the post-op diplopia test.

YS: this was discussed in the webinar. Often suppression is occurring and therefore no diplopia.

MP: Often the patients with a positive post-op diplopia test, will do well and either have no diplopia post-op or transient that goes away with time, but not always.

JZ: Right. Some patients have a large suppression scotoma and deep enough suppression that they never experience diplopia with this test. I haven't seen a patient who responds with suppression at all angles of correction on this test come back with post op diplopia.

JF: the postoperative diplopia test, even when performed by an experienced orthoptist may not be an accurate predictor of whether a patient will actually develop troublesome post-op diplopia. If the PODT suggests that a patient is aware of diplopia when only a small fraction of the deviation is corrected with prisms, I will usually offer the patients Botox treatment to simulate the effect of surgery and see if in reality they are troubled by diplopia when their eyes are straightened. For cases in which diplopia is only noted when the deviation is within 10° of being fully corrected, I normally proceed with surgery using adjustable sutures which gives me the option of adjusting their alignment post-op to alleviate any diplopia. In my experience this is rarely necessary.

6. Does going the suture parallel to or towards the limbus make a difference in terms of perforation? (for beginners) Which one is safer?

YS: The direction of the scleral pass doesn't matter – it is the entry point that matters, so that your muscle is splayed out and on stretch so you don't get central sag. You need to be able to pass the scleral pass safely so if you have better visualization and control with the pass being more parallel to the insertion or more posterior that is okay.

MP: I stress the importance of the starting point and then the most comfortable direction which can be really any direction: parallel, towards the limbus, just as long as not posterior.

JF: the direction of the suture pass is not critical, but the depth and length are. The orientation of the needle pass is often determined by the limitations to the passage of the needle by surrounding tissues and to instrumentation by the patients nose and orbital anatomy. In the case of larger recessions when I am using a fixed hang-back technique I find it easier to make the scleral passes parallel to the limbus.

7. If there is no distance near disparity, do we need to measure deviation in different gazes at near or distance as our orthoptist is doing it at near and I have read about it doing at distance.

LC: The N-D disparity does not predict what you will measure in secondary positions, so yes you still need to measure in different gazes. Pattern strabismus is typically tied to oblique dysfunction, so doing up and down gaze measurements is key; as is side gazes, to determine if there are any significant vertical deviations, which may otherwise be small or absent in primary position, that will need to be addressed surgically. And in an XT, you can often find a lessening of the exo in side gazes, which will also influence choice of surgery.

In terms of whether side gaze measurements should be done at near or distance: the standard is they are done at distance (see my comment Q1). As a rule, the basic deviation is that measured in primary position, at optical infinity, with accommodation controlled. Secondary gazes are thus compared to this standard-defined measurement. So,

performing them at near may introduce some confounders, including influence of accommodation (and accommodative vergence). Also, at near the fixation target is much closer to their face and the mechanics of the eye position would be subject to the structural orbital limitations imposed in that gaze, which would be different for each eye that is positioned towards either the lateral or medial orbit. This could impact the individual eye's motility during the alternate prism cover test and potentially give non-accurate measurements. In terms of the plane of ocular rotations, Mok did find that indeed Listing's law still held during vergence – but this is in primary position where the vergence demand is symmetric ([https://doi.org/10.1016/0042-6989\(92\)90067-S](https://doi.org/10.1016/0042-6989(92)90067-S)). In side gaze at near, the vergence demand is asymmetric (and thus has different neural underpinnings), and this may also impact your measurement, especially in an exodeviation. I'm not saying you can't do side gaze measurements at near, but you need to interpret the value you obtain very carefully.

YS: this completely depends on what the versions and ductions are and what your working diagnosis is. For example, if you have a 6th nerve palsy or Duane's, you would want to know the side gazes and to determine if there is incomitance, which will affect your surgical planning.

MP: I do not check alignment at near in side gazes, unless a child that I cannot get to look at a distance target.

JZ: Measurements at near are confounded by proximity and accommodation. It is difficult to ensure that the patient is responding with maximal and sustained accommodation at all times, so it would be tricky to decide if a change in measurement in side gaze at near was muscular or accommodative. For this reason, I always do secondary positions and tilt measurements for distance.

All patients should have measurements in the 9 cardinal positions preoperatively to ensure that the surgeon understands the patient's rotations and can balance them.

JF: If there is no near distance disparity and the versions and ductions are normal I do not routinely measure the deviation in eccentric gaze for either a near or a distance target.

8. If scleral perforation occurs, do you prefer cryo. in same setting or follow?

YS: if possible, I prefer doing in same setting. Less general anesthesia for the patient, and especially if you have patients travelling from far away as we do, you want to ensure you fix the perforation in case follow-up is challenging.

MP: I will look at the end of the case at the retina to help determine treatment. I would laser around if I felt treatment was needed, but these patients often do not need treatment.

JF: In 25 years I have never had to perform laser treatment or cryo. for a scleral perforation. I have observed a number of cases when I suspected that a scleral perforation has occurred and in some of these a visible point retinal scar has been visible on indirect ophthalmoscopy, but none have required treatment. As all of my trainees have spent many hours practicing making safe scleral passes before undertaking any form of live surgery they will never engage the sclera with the tip of the needle pointing towards the vitreous cavity so even if they do make a scleral pass which is too deep the needle is traveling almost parallel to the retina and is highly unlikely to break through the posterior hyaloid membrane.

9. Parents often ask how many surgeries has the surgeon done? Do you answer based on your hours of training on the model eye or actual procedures?

YS: I don't have a number that I tell parents, I rarely if ever get asked this. When I have been asked, more when I first started (I must look quite old now!) I tell parents that this is the most common surgery that we do, and even when I was new in practice, I had done hundreds of surgeries as a resident and fellow. I tell parents that there is a resident assisting me in surgery as we are a teaching hospital, but that I am always in the room, and responsible for the surgery etc. I think the most important point is that you need to develop trust with your patient and the family, through good communication and careful and honest explanation of the risks and benefits of the surgery. My experience is once

that relationship has been built, they aren't asking how many surgeries have you done, and are aware and accepting of complications and reops should they occur.

MP: Right after fellowship, I would often state the amount I had done that week or the week prior and that I operate weekly on these types of cases, and I did not know the exact number but hundreds, now can saw thousands. If this is directed towards a trainee, I would say that we need 4 hands to perform the surgery and that we will both be operating as a team and can also state the above for my numbers.

JF: parents and adult patients often ask me how many operations my trainees have done and I tell them that all of my trainees have spent many hours practicing their surgical technique on model eyes and that they will only undertake parts of the surgery that they have demonstrated their competence to perform using these simulation techniques. In the 21st century no resident should be undertaking any form of ophthalmic surgery until they have demonstrated their competence through simulation. The old dictum "See one, do one, teach one" is no longer ethically acceptable practice.

10. Dr. Hertle: Could you please list out the features of the loupe you use? or the features you recommend?

Here is the site: <https://www.designsforvision.com/SurgHtml/SExpTel.htm>