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1. Please could we discuss the role of autorefractors in Paediatric Ophthalmology? Is it used in all patients - with or without Cycloplegia? Is it only after a certain age? Is it only as a screening tool? Is it never used for Strabismus cases?

BK: I personally have never had confidence in, or relied on auto refractors. I do understand the technology has improved since the early versions, but I still feel my retinoscopy is more accurate and something I have more control over.

EC: In strabismus cases I use only retinoscopy; autorefractor provide very variable data

2. 4 year old patient had brain tumour surgery 8 months ago, currently off chemo. No plan for other treatments for the time being. He has bilateral 6th palsy and residual bilateral 7th palsy with good ocular surface. He has 70 prism diopter of esotropia with cross fixation. No significant refractive error and vision is 0,3 logmar in either eye. We have tried Botox injection in both medial recti-no change of esotropia/abduction. We have listed him for left eye MR recession 5mm and SR transposition next to the LR+ Botox MR. We will the second eye on a second operation. Would you consider anything else? Any pearl of wisdom in dealing with this complicated patient?

BK: Just to include Foster augmentation sutures with the SR trans

EC: I would do, as first operation, a bimedial equatorial recession with nothing else. Botox of no use now. Possible transpositions after some years.

3. After unilateral surgery for superior oblique palsy, how can you differentiate between a simple overcorrection phenomenon and masked contralateral SOP? Any Tips?

BK: It can be hard to differentiate but a main finding is that a bilateral masked should have fundus exocyclo in the eye that was initially thought to not have a SO palsy. With an overcorrection, it typically should not. Also, look for soft signs in the pre-op notes. Were measurements done in the oblique fields to look for a reversal of the hyper, etc.

EC: Sometimes impossible and a recession of the contralateral inferior oblique is indicated.

4. In patient with V pattern esotropia with IOOA, can we go for horizontal muscles surgery first and then IO recession in 2nd stage or both should be done in same session? How much IO recession do you do?

BK: there is no reason not to do it at the same time. If there is no hyper in primary, do the IO rec symmetrically. For moderate IO OA I do 8 mm, and for very marked I do about 12mm. If there is a hyper in primary I do it asymmetrically

EC: In the presence of overacting inferior oblique muscles, I would do in the same operation oblique and recti muscles. Generally, inferior oblique surgery should be equal in both eye even if their overaction appears as asymmetrical ECC.

5. How do you quantify angle of kappa and how is it incorporated in measurement of squint while planning squint surgery?

BK: In most cases, if you are using prism and cover measurement, angle kappa need not be taken into account. The measurement with the prism cover test will be accurate for surgery planning. The only exception are cases of a very large unilateral angle kappa in an eye with poor vision e.g. cicatricial ROP, where there is no hope for fusion and surgery is for cosmesis. In that case operate for the Hirschberg or Krinsky measurement with the good eye fixing. But, if for some reason you want to quantify the angle kappa, have the patient fixate a light with the eye in question, and observe how many millimetres off centre the light reflex is. Then use the usual Hirschberg formula to convert that to prism diopters

6. [Video Clip from Amgad Eldib](#)

BK: It may be different if we are talking about infantile constant XT or intermittent XT. The former is sensorially like infantile ET. The only difference is that the direction of the strabismus is different (XT vs ET). In infantile constant XT unless you operate pretty early, there is negligible change of good fusion. So you have to weigh how delayed and impaired the child is, with the chance (and benefit) of gaining fusion with early surgery. With intermittent XT, you also have to weigh how impaired the child is versus the benefits of intervention. If I feel intervention is appropriate, I treat them the same as non-delayed children, provided I can get good measurements. I personally have not experience with Botox in this setting

7. [Video Clip from Bolutife Olusanya](#)

BK: Sometimes we make a clinical observation, and then try to explain why. The fact is that for years many have observed that these patients do better ("basic" IXT does not do as well as the "pseudo div excess" or "true div excess." To answer why that observation seems factual is what you are asking. I can only assume it is because the Scobee Phen is a stronger type of fusional mechanism, and that helps control

8. [Video Clip from Claudia Polo](#)

BK: It depends on some factors. If the patient has a significant refractive error and needs glasses, or is willing to wear glasses, then prism is an option — especially if the deviation is on the smaller side like 2- 7 PD. If glasses with prism are not an option, and it is a vertical deviation, I might be inclined to do the partial tenotomy at the insertion like Alan Scott described, especially if on the smaller side. If close to 10 PD, a small recession of a vertical rectus would be my choice. One might also consider a small central plication. If incomitant and an oblique is overacting, I would address that. For a horizontal deviation I might consider Botox, or a small recession

9. [Video Clip from Kateryna Fedchuk](#)

BK: I am afraid the way the question is worded I am unclear what is being asked. It is unclear if you are talking about bilateral SOP or unilateral. And by persistent, I do not know if you mean residual after prior surgery, or an acquired SOP that did not resolve. But in either case, I have not entertained this proposed treatment

10. [Video Clip from Kianti Darusman](#)

BK: With the growth of AI in so many areas, I would be surprised if it does not make a showing in our field. But given the current state of AI, I am hard pressed to view this as a good thing. All I have to do is think about EVERY time I call or online chat with a company that uses AI to initially try and answer customers question, I find it never satisfactory. But like so many things, in the early stages technology is rough and then improves. So I do not know

11. [Video Clip from Mauro Goldchmit to BK](#)

BK: I assume in select cases there might be a role, but I have no personal experience. When I stopped active practice, the use of it in children was just starting to be reported. Very few centres were equipped to have a laser in the OR, which also limited access. But being conservative by nature, I would wait until there are studies of long term safety when done in children. I do not think of glasses as being that onerous, so I would probably at the start limit it to cases where glasses or contact lenses are not an option

12. [Video Clip from Melih Ceylan](#)

BK: I think for the right patient, this is a great option. The most important thing for artificial divergence to work, is that the patient has to have fusion. In my own practice, the majority of nystagmus patients have manifest tropias and do not fuse, so this is not an option. One approach I learned from Lionel Kowal is to put the patient is about 6-7 PD base out ground in (or Fresnel) prism, OU, and combine that with about 1 D of overminus. If they wear them comfortably and can fuse with about a month of wear, one can get a good result from artificial divergence surgery. I am typically doing about 5-6 mm recessions on both medial recuts muscles

13. [Video Clip from Parth Shah](#)

BK: I think imaging will play an important role. I also think identifying factors that lead to variability in outcomes. Currently our surgery is mainly based on one parameter- the size of the deviation. Certainly there are other factors that affect outcomes e.g. muscle stiffness, force generation, etc. As we learn to identify more of these important variables, ways to quantify them and take them into account, we will make a big leap forward.

14. [Video Clip from Seo Wei Leo to BK](#)

BK: I have a routine of starting with some form of alternate occlusion several hours a day. This almost always improves control and decreases the angle. I then taper it and stop. If the deviation recurs, which is often does, I re-institute the program, and after improvement put the patient in several diopters of over minus with 2-3 PD base in prism OU. My entire protocol and results was published in Kushner, BJ. Conservative management of intermittent exotropia to defer or avoid surgery. J AAPOS. 2019;23(5):256 e1- e6.

15. I found one case of Acute Esotropia in this pandemic era in a boy, age 10 year old caused by too many close work related to school from home. How is the management and for how long should we wait for deciding strabismus surgery?

BK: You need to be sure this is not just accommodative spasm. Are the pupils small and an induced myopia? If not, and you are seeing this fairly recently after onset, you might put him in prism and then see if you can wean him out of them over a period of weeks or months. I have been successful with this approach in several

EC: I would prescribe prisms which eliminate diplopia for 2 months and then, if the situation is stable, do a bimedial recession. If spontaneous improvement, trial of weaning out prisms before surgery

16. How many mm do you elevate the muscles? & Do you do it in one or both eyes?

BK: I am not clear for what you are doing this. If it is to treat and A or V, I typically raise or lower them $\frac{1}{2}$ tendon for smaller patterns and $\frac{3}{4}$ for larger. Always do it symmetrically unless you are trying to get rid of a hyper in primary. If there is no hyper, doing just one eye will create a hyper

17. For adults with convergence insufficiency type of exotropia i.e., someone that cannot tolerate prisms, what is the best procedure to offer?

BK: I operate for the distance deviation and do not think it matters if you resect the MRs, or recess the LRs. I also transpose them $\frac{3}{4}$ of a tendon to CREATE a V pattern

EC: Plication of medial recti, informing that diplopia for distance will be induced post-op for distance for 2-3 months

18. 13 out of 19 didn't need glasses for ET - were they divergent WITH their hyperopia corrected?

BK: No, but the only ones who were taken out of glasses were the ones with low plus. If patient had more than about 2.5 D of plus, the long-term outcome of cutting plus is not good. It is only a temporary fix. So would not include them

19. In a case of convergence excess, which is preferred - near correction or distance correction with Faden?

BK: my own experience with a randomized prospective trial had better results with operating for the near

EC: If convergence excess with normal binocular vision, I would do bimedial recession. Innervational excess without normal binocular vision → Myopexy

20. What is the opinion of the panellists on superior and inferior half of MR different tightening for CI, inferior more than superior? (Related to Demers' work)

BK: I think this is still an evolving issue. As of the last I checked, Demer showed there is compartmental innervation to the MR. But it has not been shown (I think) that one compartment is selectively innervated with convergence. Also, in theory, sarcomere remodeling should negate the effect of slanting. Nevertheless, there are some good reports using that technique. So, I would not completely discount it, but not yet advocate it

EC: Of no clinical value

21. Is there a comparison with augmented recession described by Dr. Demer?

BK: It is not clear what you are asking it to be compared to

22. When a new technique is used in strabismus, does the panel get an IRB / a consent to say this is a new or modified procedure?

BK: If you know you are planning to research on this like writing it up, one needs an IRB approval. But if you are just trying something new and not prospectively collecting data, you do not need an IRB approval but do need to explain clearly to the patient and get consent.

EC: I always do it

23. For infantile esotropia, what is the best surgical strategy that the panel suggests?

BK: this is an evolving issue due to trade-offs. I think it is shown that high grade stereo requires early alignment. But there are no studies showing the predictability of getting good alignment with surgery at 4 or 5 months. A classic study by Swan (Extraocular muscle surgery in early infancy—anatomical factors, JPOS 1984) gave me pause about very early surgery. He studied the distance of the MR from the limbus in newborns and older subjects from autopsy eyes. Most of the growth occurs posteriorly. In a newborn, the MR insertion is almost the same distance from the limbus as in an adult, but it may be at the equator. Most of the posterior growth is over by about 8 months of age. I recall one patient I saw who underwent MR rec of 6 mm at 4.5 months of age by someone else. She was initially well aligned and was when I met her around age 5. But she started going exo. When I operated for it, I found one MR 14mm and the other 15 mm from the limbus. This could not have been muscle slippage from non-adherence as she was aligned for many years, and there was no stretched scar. I assume this is the result of the growth change from her young age to later. So, until someone presents data to me on the success rate of alignment, with reasonable long-term follow-up, after very early surgery, I forego the benefit on stereo of very early surgery, and wait till about 8 months of age. There also is new concern about the effect of anesthesia in very young, on neuro-development. This is also unknown as to how it relates to what we do

EC: Depends on ocular motility. Bimedial recession only, sometimes associated with oblique muscles surgery

24. Richard, do you go for nystagmus surgery in absence of AHP?

RH: Yes, search "tenotomy and nystagmus and surgery" for articles in PubMed online.

25. Dr. Kushner: How much overcorrection for distance did the patients get initially?

BK: Interestingly, none or minimal. I do not recall any that were overcorrected at distance, even initially. I think my data showing that the effect at DISTANCE seemed inversely related to the AC/A (higher AC/A meant fewer PD per mm of recession at DISTANCE may explain that. But why that occurs is a mystery

26. In which cases do you use botulinum toxin therapy instead of surgery? And indications for prescription prisms?

EC: Acute sixth nerve palsy and essential infantile esotropia on both medial recti before 6 months of age

27. Should we wait for 4 weeks of full-time glasses wear to establish the diagnosis of partially accommodative esotropia and then operate after 4 weeks?

BK: I have found 4 weeks is adequate

EC: Makes sense

28. Does the Faden procedure have a stronger effect than a pulley fixation?

EC: No proof for it