Infantile Esotropia: Preferred Postoperative Alignment

Panelists: Frederick M. Wang, MD, Mark Ruttum, MD, Dawn N. Duss, MD

Wagner: This is a case of infantile esotropia. Six weeks following a 6-mm recession of the right and left medial rectus muscles in a 7-month-old infant with typical infantile esotropia findings and no vertical deviation at all, you find a residual esotropia of 12 prism diopters. Dr. Wang, what is your management at this time?

Wang: Is the 12 diopters distance, near, or both?

Wagner: We’ll say it’s accommodative. It’s pretty much distance and near.

Wang: The first thing I would ensure is that I have his cycloplegic refraction. If he had more than 2.5 diopters of plus I probably would try spectacles. If not, I think 12 diopters is a satisfactory position to leave him in and see him back in a month or so.

Wagner: I’ll assume that in this case it was alternating. Would that change your opinion, if he had a preferred fixation in one eye that you could determine from your examination?

Wang: If he had a preferred fixation of one eye, you would start patching but I’m still satisfied with his alignment result.

Wagner: Dr. Ruttum?

Ruttum: I certainly agree. I think you have to make sure he doesn’t have amblyopia because that can make it worse over time. I agree that at 7 months I probably wouldn’t put him in glasses unless it was really high. I think that in most children that’s a pretty reasonable result. I would imagine the parents would be happy about it and I would be happy if he saw well in each eye and the alignment was stable.

Wagner: Dr. Duss?

Duss: I agree as well. I think a 12-diopter residual is acceptable. I would double check the cycloplegic refraction and I would prescribe anything over 2 or 2.5.

Wagner: Dr. Ruttum, what would be an acceptable range for postoperative deviation in a case like this? And let’s go both ways, exotropia and esotropia.

Ruttum: I would not like any exotropia at this stage because I don’t find that they tend to come back and there are parental concerns. Parents are good at spotting a little overcorrection and not so good at spotting a little undercorrection. But I think 12 diopters is starting to get to a gray zone where they might look okay and they might not. But more than that, I would consider additional surgery if the patient didn’t have any refractive issue that I could address it with.

Wagner: Dr. Duss?

Duss: I agree. I think my limit would be 15. I think 12 is pushing it. Anything over 15 I would probably consider reoperating. And I agree, I think parents are aware of converting an esotropia to an exotropia. I believe they prefer to see a little residual esotropia and they are more understanding if you need a second surgery than if you flip the child and end up going exotropic.

Wagner: Dr. Wang, anything to add on that?

Wang: No, I agree. I assume that this is a healthy child who has no other problems. There are children who I’ll let be even a little more esotropic than that, such as children who have high toned cerebral palsy and albinos who have positive angle kappas. There are some children in whom I’ll accept up to almost 20 diopters of esotropia. A lot depends on what their face looks like. It’s a bit hard to tell at 6 or 7 months of age, but that’s more of a consideration later on.
Wagner: Dr. Wang, some people have advocated operating as close to 6 months as possible, even before, with the idea of perhaps getting better binocularity in the long term. Do you find that's a big issue and what do you believe is the appropriate age to perform strabismus surgery in infantile esotropia?

Wang: Well, certainly the appropriate age is the age at which you can assess the deviation in that particular child well. Some associated oblique dysfunctions in children are easier to examine than others. But given a child who you can assess properly, my approach usually is to try to do the surgery some time between 7 and 9 months of age. I think your anesthetic risk goes down.

I saw a few of the children in the study that was done on early-onset esotropia who actually resolved between 2 and 4 months of age with a large-angle fixed esotropia. So that can occur and that's why the study that came out of the Cooperative Study Group showed that we probably shouldn't be operating on these children at 2 or 3 months of age.

I think if you go back all the way to Malcolm Ing's study, he didn't get any better peripheral fusion, which really is your goal here, even in children who were aligned by 1½ or 2 years of age. That was satisfactory. However, I think you want to give yourself the opportunity to do that second surgery in that window and that's why I usually will schedule a child who comes into my office early. Approximately 7 months of age is my call.

Wagner: Dr. Duss?

Duss: I look at the angle itself, how big it is and also whether it's manifest or intermittent. I might wait a bit if it's intermittent or a smaller angle deviation. I have seen children improve on their own, especially if there's concomitant systemic developmental delay or other genetic or endocrine concerns. But I definitely try to get them completely straight by 18 months, even if they require two surgeries. That would be my goal. I tend to watch them a little more in the beginning, especially if they have a variable angle or other systemic concerns.

Wagner: Dr. Ruttum, do you have anything to add?

Ruttum: Again, it's rare to see these children really early because pediatricians often don't send them to a pediatric ophthalmologist that early. They're watching them for you in a sense. But I think the ones I see who have large constant deviations, perhaps on two visits within a month or so, I would be willing to operate on as early as 5 months if there are no health considerations.

Wagner: Dr. Ruttum, have you seen changes in the deviation over years and what might be the implications of initial postoperative alignment regarding that? Do you observe the child you've operated on for infantile esotropia for another year or some other period of time?

Ruttum: If I had to make a general statement, it would be the ones who follow up, who come back and wear their glasses and do their patching, tend to be more stable than those who are lost to follow-up or where there's poor compliance. So I don't see any definite trend for those who are following instructions and follow-up visits and all that of getting worse or decompensating over time.

Wagner: Dr. Wang?

Wang: I think there are a number of groups of children with congenital esotropia. A lot depends on their binocular potential. Often, you'll operate on a child and his eyes will be fairly straight postoperatively, let's say within 10 diopters of being straight, and he'll stay that way for the rest of his life. That's the majority. These children have peripheral fusion.

Then there are children with poor binocular potential whose eyes drift either in or out after being relatively straight. Their fusion is poor. In this group, if the eye drifts out, this trend continues over years. This group seems to have more dissociated vertical deviation.

If I have a child whose eyes are straight for a few months and then go in, I'm less likely to operate on that child at 10 or 12 diopters or even 14 or 15 diopters of esotropia. That child probably does not have good binocular function and will go exotropic easily if you reoperate.

We have been trying to do inferior oblique transpositions at the first surgery, if we see any overaction, to prevent that later dissociated vertical deviation and I think it works. I see few dissociated vertical deviations in the patients for whom we do inferior obliques at the time of the original surgery.

Wagner: Do you tend to find that in children older than 6 or 7 months or is it not related? When you see the inferior oblique overaction, do you think it's a factor that you don't necessarily see at your initial visit, but you might see it slowly over time?

Wang: Yes, but we look closely at the initial visit and if we have even a suspicion, we do the obliques
at the time we do the medial recti. The exception is if you see underaction or an A pattern, of course, but otherwise we try to do them.

**Duss:** I have also seen a tendency for the children with congenital esotropia to develop inferior oblique overaction over time and it has caused me to start to look carefully at the obliques vergence early on. In the younger population it can be difficult, especially if they have a large-angle constant esotropia, to pick up on that inferior oblique overaction.

**Wagner:** I think that’s the justification for some surgeons to delay their surgery until approximately 1 year of age. Sometimes they’ll say that if it develops they would like to take care of it at one time. But I agree that if I see anything initially I would like to take care of it if I can at that point.

One last question, what is the maximum amount you like to recess the medial rectus muscle when you do surgery for infantile esotropia before you might consider going to another muscle?

**Wang:** Six and a half.

**Duss:** Six to 6.5.

**Ruttum:** I might go up to 7 in a child who was a little older, but in 12 to 18 months, 6.5 would probably be my maximum.

**Wagner:** I think we covered this topic well. I’d like to thank you all for coming.

*This Eye to Eye was conducted on Thursday, April 3, 2008, during the annual meeting of the American Association for Pediatric Ophthalmology and Strabismus.*