

# Comment on survival analysis following early surgical success in intermittent exotropia surgery

*Onder Ayyildiz<sup>1</sup>, Gokhan Ozge<sup>1</sup>, Cem Ozgonul<sup>2</sup>, Gokcen Gokce<sup>3</sup>, Fatih Mehmet Mutlu<sup>1</sup>*

<sup>1</sup>Department of Ophthalmology, Gulhane Military Medical School, Ankara 06010, Turkey

<sup>2</sup>Department of Ophthalmology, Van Military Hospital, Van 65100, Turkey

<sup>3</sup>Department of Ophthalmology, Kayseri Military Hospital, Kayseri 38100, Turkey

**Correspondence to:** Onder Ayyildiz. Department of Ophthalmology, Gulhane Military Medical School, Ankara 06010, Turkey. dronderayyildiz@gmail.com

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**Dear Editor,**

We read the article by Lee *et al*<sup>[1]</sup> with great interest. We would like to congratulate the authors for venturing into this area that assess the consecutive recurrence following early success of intermittent exotropia [X (T)] surgery and to determine the clinical factors that affect the survival. However, we would like to make the following comments.

In the present study, it was discussed about the correlation of early postoperative overcorrection with long-term outcomes. It is known that most authors would agree to an early postoperative overcorrection in adult patients with X (T), the same may not be correct for pediatric patients. On the contrary, most ophthalmologists believe that intentional overcorrection should be avoided in pediatric patients with immature visual systems because of the risk of developing a suppression scotoma and monofixation esotropia, which can lead to loss of stereopsis and amblyopia<sup>[2-3]</sup>. Also reoperation rates, risk of developing amblyopia and loss of fusion were greater in pediatric age group<sup>[2]</sup>. Thus, it is believed that surgery in this age group is reserved in whom rapid loss of control is documented<sup>[3]</sup>. As the authors have not evaluated sensory outcomes and only motor surgical success rate has been evaluated, the effect of recurrence of X (T) and long-term outcomes on binocularity, stereopsis and development of amblyopia is not assessed and may, therefore, be considered a limitation of the study.

In the present study we did not find any information about the preoperative follow-up periods and noticed that all patients were managed surgically. It is well-known that the ocular deviation in X (T) may remain stable for many years, and in few cases, it may even improve especially in cases of mild-to-moderate X (T)<sup>[4]</sup>. So, the patients with mild-to-moderate X (T) should be evaluated carefully for indications of surgery after a sufficient preoperative follow-up period and actual control of the patients over the exodeviation and deterioration of stereoacuity should be established<sup>[5]</sup>. In this study sensory outcomes was evaluated only with Titmus test for near stereoacuity. But it is well-known that deterioration of near stereoacuity occurs infrequently over the short term and would thus rarely be an indication for surgery<sup>[6]</sup>. Distance stereoacuity can be used as an objective measure not only of the control of the exodeviation but also for deciding the timing of surgery<sup>[6]</sup>.

Moreover the authors did not classify patients with X (T) by their specific type which could have affected the surgical outcomes. Visual acuity details and refractive errors also were not mentioned in this study, as variability in subnormal vision and refraction can affect the stereoacuity and motor fusion.

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**Dear Editor,**

I appreciate Ayyildiz *et al*'s attention and opinions on this study.

I wrote my opinion (answer) to the questions.

"We read the article by Lee *et al* with great interest. We would like to congratulate the authors for venturing into this area that assess the consecutive recurrence following early success of intermittent exotropia [X (T)] surgery and to determine the clinical factors that affect the survival. However, we would like to make the following comments.

In the present study, it was discussed about the correlation of early postoperative overcorrection with long-term outcomes. It is known that most authors would agree to an early postoperative overcorrection in adult patients with X (T), the same may not be correct for pediatric patients. On the contrary, most ophthalmologists believe that intentional overcorrection should be avoided in pediatric patients with immature visual systems because of the risk of developing a suppression scotoma and monofixation esotropia, which can lead to loss of stereopsis and amblyopia."

It's not true for "all" pediatric patients. Small consecutive esotropia during the early postoperative period can be beneficial in the older children or adults to inhibit the long-term recurrence of exotropia but should be avoided in visually immature children, that is, very young children (younger than 3 to 4 years old). Furthermore, "early postoperative overcorrection" means transient esotropia during initial postoperative a couple of weeks. It does not mean actual overcorrection.

We abided by Park and Mitchell's <sup>[1]</sup> surgical normogram in deciding the surgical amount. The normogram's intended postoperative results are approximately 10 PD initial overcorrection at postoperative 1d considering exotropic shift in early postoperative days and it finally aims orthophoria in a couple of weeks after surgery. But it is just an "intention" and the initial postoperative results were actually "unpredictable" with the same surgical normogram and those were more esotropic rather than its intended overcorrection or were undercorrection as we could find in most published articles for exotropia surgery <sup>[2]</sup>. Moreover, the initial overcorrection cannot predict long-term motor outcomes <sup>[3-4]</sup>. We respect the classic surgical normogram and we believe it doesn't intend actual overcorrection, it aimed final orthophoria or exophoria as small as possible. We never intend more overcorrection. Do you reduce the surgical dose for pediatric patients? We didn't do. We believe an undercorrection in exotropia surgery is not desirable. Early reoperation for recurrence is usually inevitable in the undercorrected cases. We would use classic surgical amount in pediatric patients if the surgery is indicated in the children and we perform alternate patching over 6h a day during the initial postoperative days when they show immediate

postoperative overcorrection.

"Also reoperation rates, risk of developing amblyopia and loss of fusion were greater in pediatric age group. Thus, it is believed that surgery in this age group is reserved in whom rapid loss of control is documented. As the authors have not evaluated sensory outcomes and only motor surgical success rate has been evaluated, the effect of recurrence of X (T) and long-term outcomes on binocularity, stereopsis and development of amblyopia is not assessed and may, therefore, be considered a limitation of the study."

Thank you for your comment. The main subjects of this present study is survival analysis and the survival was determined by motor outcome (postoperative deviation angle). We did not analyse detailed sensory outcome. Moreover, the patients in this study were all intermittent exotropia who had motor abnormality (exodeviation) but they had preserved binocularity as you know, and we exclude amblyopia and constant exotropia with no binocular function. We did not think the binocularity like near stereopsis (it is usually good in intermittent exotropia patients) is an important factor.

You also mentioned about distance stereopsis at the paragraph below. Regretfully, there is no distance stereoacuity measurement device in our hospital. The device should be useful to perform clinical research. However, it has not come into wide clinical use as far as I know. Instead of distance stereopsis, I would check the distance fusional control state (motor fusion) and distance central suppression with distance vectography (sensory fusion) at 6-meter distance in my office. The results of distance fusional control state evaluation were included in this present study<sup>[5]</sup>.

"In the present study we did not find any information about the preoperative follow-up periods and noticed that all patients were managed surgically. It is well-known that the ocular deviation in X (T) may remain stable for many years, and in few cases, it may even improve especially in cases of mild-to-moderate X (T). So, the patients with mild-to-moderate X (T) should be evaluated carefully for indications of surgery after a sufficient preoperative follow-up period and actual control of the patients over the exodeviation and deterioration of stereoacuity should be established. In this study sensory outcomes was evaluated only with Titmus test for near stereoacuity. But it is well-known that deterioration of near stereoacuity occurs infrequently over the short term and would thus rarely be an indication for surgery. Distance stereoacuity can be used as an objective measure not only of the control of the exodeviation but also for deciding the timing of surgery."

All our subjects in this study were surely managed surgically because patients with no surgical treatment were not eligible in this study. We had many patients with intermittent exotropia who regularly visited to our clinic and didnot

undergo the exotropia surgery.

About preoperative follow up, its very complicated problem and I think the preoperative follow up should be individualized in every patients. In the big scheme of things, in my routine clinical practice I usually follow up the patients with intermittent exotropia before surgery at least three times with 2- or 3-month interval, if the patients meet surgical indication when they come to my clinic for the first time. On the other hand, in the patients who is very young and/or who have not so large angle and/or good to fair distance fusion control state, I can follow up them for years. The need for surgery can be determined by complicated factors including the state of fusional control, the deviation angle, the patients age etc as you know. But I don't consider the near stereoacuity (that is usually preserved in intermittent exotropia) as an important indicator for surgery.

"Moreover the authors did not classify patients with X (T) by their specific type which could have affected the surgical outcomes."

Thank you for your comment. We did not analyse the X(T) type (that means near distance difference; convergence insufficiency or divergence excess *etc*) in this results. I agree it should be an interesting factor. We will reflect it in our future study.

"Visual acuity details and refractive errors also were not mentioned in this study, as variability in subnormal vision and refraction can affect the stereoacuity and motor fusion."

All my patients with exotropia were prescribed the glasses if they had refractive errors and needed the refractive correction

to get best corrected vision. We divided the patients with myopic glasses and others in this study to evaluate the effect of the myopic glasses with full correction or small overcorrection (we usually prescribe full myopic corrective glasses or small over-myopic glasses postoperatively in myopic patients) but the survival rates were not different<sup>[5]</sup>.

This study did not include the patients with subnormal vision. We excluded the amblyopic patients (see the methods part).

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Sincerely,

Lee JY

Department of Ophthalmology, Hallym University Medical College, Hallym University Sacred Heart Hospital, Korea