Author’s response to reviews

Title: Comparison of Outcomes of Unilateral Recession-Resection as primary surgery and reoperation for Intermittent Exotropia

Authors:

Young Bok Lee (paradox_nom@hallym.ac.kr)
Dong Gyu Choi (eyechoi602@gmail.com)

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Author’s response to reviews:

Editor Comments:

We thank the authors for the kind revisions. Though they have tried to address most of the concerns in the revised manuscript, still there are some important concerns that remain. We request the authors' to address these.

1. Though the authors have redefined the motor success as deviation less than or equal to 8 PD. However, it is still not clear if this made a real difference to the percentage of patients with success in the two groups. Authors should mention it in the response file.

- Thank you for your comment. According to previous study, Wu H et al. defined the surgical success as exo- or esodeviation within 8 PD [Wu H et al. Binocular status after surgery for constant and intermittent exotropia. Am J Ophthalmol 2006;142:822-6]. Like this study, we redefined the surgical success criteria of post-operative deviation less than/equal to 8 PD. Considering the comment of reviewer 1, we also agree that only the motor success criteria would not be adequate for a patient with intermittent exotropia and foveal fixation who postoperatively resulted in a monofixational esotropia. However, in the present study, the patient with monofixational esotropia was not found postoperatively and all the patients with the motor success had a good stereoacuity (≤ 100 seconds of arc) based on Titmus stereotest. Thus, we considered that the definition of surgical success about motor alignment was suitable for our study.

Reviewer reports:

Reviewer 1: Abstract

1. Surgical success was defined as exo- or esodeviation within 8 PD. This definition is limited to a motor success. Authors have adjusted the success to be within 8 PD of eso-exo. But this
is still a definition that may not be adequate in for a patient with intermittent exotropia and foveal fixation who postoperatively resulted in a monofixational esotropia.

- Thank you for your comment. According to previous study, Wu H et al. defined the surgical success as exo- or esodeviation within 8 PD [Wu H et al. Binocular status after surgery for constant and intermittent exotropia. Am J Ophthalmol 2006;142:822-6]. Like this study, we redefined the surgical success criteria of post-operative deviation less than/equal to 8 PD. Considering your comment, we also agree that only the motor success criteria would not be adequate for a patient with intermittent exotropia and foveal fixation who postoperatively resulted in a monofixational esotropia. However, in the present study, the patient with monofixational esotropia was not found postoperatively and all the patients with the motor success had a good stereoacuity (≤ 100 seconds of arc) based on Titmus stereotest. Thus, we considered that the definition of surgical success about motor alignment was suitable for our study.

2. “However, there was a significant difference in the mean angle of deviation between the two groups from postoperative 3 months to final follow-up (p<0.05): in short, group A had become more exotropic than group B. Also, the surgical success rate was higher in group B (83.3%) than in group A (47.7%) at final follow-up (p=0.002).”

This statement is not clear. Are the authors referring to early postoperative follow up and final postoperative follow up? Please clarify and correct.

- We appreciate your valuable comment. We revised the sentence as follows: “However, there was a significant difference in the mean angle of deviation between the two groups at each visit from postoperative 3 months to final follow-up (p<0.05): in short, group A had become more exotropic than group B. And the surgical success rate was higher in group B than in group A at each visit from postoperative 12 months to final follow-up (47.7% in group A and 83.3% in group B at final follow-up) (p<0.05).” at page 2, lines 39-43.

3. Unilateral R&R as reoperation presented better results for the surgical treatment of recurrent exotropia, showing a smaller exodrift pattern and higher surgical success rates compared with R&R as a primary surgery. I am concern that authors compare two groups that cannot be compared.

- Thank you for your indispensable comment. When we encounter patients who are to undergo reoperation for recurrent exotropia in clinical settings, they or their parents usually are concerned about the prognosis and the accuracy of the surgical dosage for avoidance of complications such as over- or undercorrection. These questions prompted us to compare the
postoperative outcomes of the same surgical procedure (R&R) as primary surgery and reoperation for intermittent exotropia.

According to previous studies, other authors compared the postoperative outcomes of the same surgical procedure for intermittent exotropia between two groups even though you are concerned that we compare two groups that cannot be compared. In Lee et al.’s report, they compared the postoperative outcomes of unilateral LR recession for exotropia between first and second operations [Lee et al. Comparison of outcomes of unilateral lateral rectus recession for exotropia between first and second operations. Korean J Ophthalmol 2011;25:329-333]. In another study, Kim and Kim also compared the degree of exodrift in R&R as reoperation with that as primary surgery [Kim WJ, Kim MM. The clinical course of recurrent intermittent exotropia following one or two surgeries over 24 months postoperatively. Eye. 2014;28:819-24]. To conduct the comparison of surgical success rate and dose-effect ratio between primary surgery and reoperation, we planned to make the study design similar to Kim and Kim’s study. To some degree, the impact that primary surgery had on the group would be likely to have acted as a bias affecting surgical outcomes such as postoperative angle of deviation and surgical success. However, our study design would remain a meaningful and possible comparative case series in any event, given that we had concluded that we did not need to modify the surgical dose of reoperation by assessing the surgical success and dose-effect ratio of R&R as reoperation. In conclusion, we thought that the surgical outcomes could be compared between two groups.

Methods

4. In group B, the primary surgery for exotropia was unilateral lateral rectus recession (ULR) in 4 patients (10%). Where those 10% patients also basic deviations before surgery 1. Those patients should be eliminated from the study. Authors should also include more comparisons. All (except those 4 patients that I recommend to eliminate) group B patients underwent R-R as the primary surgery as well. Similar to Group A patients. Authors must compare Group A and initial surgery Group B patients. Were groups similar.

- Thank you for your indispensable comment. Considering your comment, we also agree that it would be adequate to eliminate 4 patients who had undergone ULR recession as primary surgery from group B. After eliminating those patients, we had a statistical review for the patients in group B and modified the data throughout the manuscript.

As we already mentioned in comment #3, we thought that the surgical outcomes could be compared between groups A and B. According to previous studies, other authors compared the postoperative outcomes of the same surgical procedure for intermittent exotropia between two groups even though you are concerned that we compare two groups that cannot be compared. In Lee et al.’s report, they compared the postoperative outcomes of unilateral LR recession for exotropia between first and second operations [Lee et al. Comparison of outcomes of unilateral
lateral rectus recession for exotropia between first and second operations. Korean J Ophthalmol 2011;25:329-333. In another study, Kim and Kim also compared the degree of exodrift in R&R as reoperation with that as primary surgery [Kim WJ, Kim MM. The clinical course of recurrent intermittent exotropia following one or two surgeries over 24 months postoperatively. Eye. 2014;28:819-24]. To conduct the comparison of surgical success rate and dose-effect ratio between primary surgery and reoperation, we planned to make the study design similar to Kim and Kim’s study. To some degree, the impact that primary surgery had on the group would be likely to have acted as a bias affecting surgical outcomes such as postoperative angle of deviation and surgical success. However, our study design would remain a meaningful and possible comparative case series in any event, given that we had concluded that we did not need to modify the surgical dose of reoperation by assessing the surgical success and dose-effect ratio of R&R as reoperation.

5. Surgical success was defined as ocular alignment within 8 PD. Overcorrection was defined as esodeviation over 8 PD. Same concern.

- Thank you for your comment. According to previous study, Wu H et al. defined the surgical success as exo- or esodeviation within 8 PD [Wu H et al. Binocular status after surgery for constant and intermittent exotropia. Am J Ophthalmol 2006;142:822-6]. Like this study, we redefined the surgical success criteria of post-operative deviation less than/equal to 8 PD. Considering your comment, we also agree that only the motor success criteria would not be adequate for a patient with intermittent exotropia and foveal fixation who postoperatively resulted in a monofixational esotropia. However, in the present study, the patient with monofixational esotropia was not found postoperatively and all the patients with the motor success had a good stereoacuity (≤ 100 seconds of arc) based on Titmus stereotest. Thus, we considered that the definition of surgical success about motor alignment was suitable for our study.

6. The primary outcome measures included the surgical success rates based on the postoperative angle of deviation at distance as well as the sensory status determined by Titmus stereotest and Worth-4-dot test (W4D), which were compared between the two groups.

Please clarify why only distance. When operating on patients with basic deviation one assume that the decision for surgery on the MR was also based on the near angle of deviation. Please also clarify if the sensory measurements were obtained for near or for distance.

- Thank you for the excellent comment. In this study, we routinely estimated the pre- and postoperative angle of deviation at distance and near. When we decided the surgical dosage of recess-resect, we refer to the preoperative angle of deviation at distance and near. Based
on the postoperative angle of deviation at distance and near, we defined the surgical success and compared the surgical success rates between two groups. We are profoundly sorry to describe the incorrect sentence by mistake. We added the word “near” into the sentence at page 7, line 132. The Titmus stereotest and Worth-4-dot test (W4D) were performed at near (0.3m) and distance (6m), respectively. We revised the relevant sentence as follows: “Stereopsis was examined by Titmus Stereotest at near (0.3m) (Stereo Optical Co., Inc., Chicago, IL, USA). Before the disruption of fusion by alternate prism cover test, the Worth-4-dot test was performed at distance (6m)” at page 6, lines 109-111.

Results

7. In both groups, postoperative stereoacuity, at each visit, was better than preoperative stereoacuity (p<0.05). At final follow-up, the mean stereoacuity was 55.65 ± 18.54 seconds in group A and 57.33 ± 19.07 seconds in group B (p=0.789). Fusion on Worth-4-dot test, at final follow-up, was observed in 60% of patients in group A and 52.9% of patients in group B, which difference was not significant (p=0.666).

There was a high rate of suppression which is unusual in patients with intermittent exotropia. (unless patient sensory status was measured at distance) 40% in Group A patients and almost 50% in group B patients. Was the sensory status measured preoperatively? This information is very important especially when presented data based on motor alignment.

Authors are not presenting data on postoperative alignment. How many patients were exotropic and how many patients isotropic postoperatively. And how many of those consider successful patients were overcorrected postoperatively. And in how many of those patients the sensory status improved or deteriorated

- Thank you for your indispensable comment.

1) We routinely measured the sensory status at preoperative visit. The preoperative sensory status was described in Table 2. On Titmus stereotest, the improvement of stereoacuity was observed in 65.9 % of patients in group A and 63.9 % of patients in group B. Although the deterioration of stereoacuity was found in 4.5 % patients in group A and 5.6 % of patients in group B, they had a good stereoacuity (≤ 100 seconds of arc) at pre- and postoperative visit. We added these sentences at page 9, lines 181-185.

We are deeply sorry to state that the proportion of the patients with fusion on Worth-4-dot test was incorrect. We rechecked the number of patients with fusion on Worth-4-dot test manually. At final follow-up, only 38 patients in group A and 32 patients in group B can perform the Worth-4-dot test with their cooperation. And fusion on Worth-4-dot test was observed in 29 patients (76.3%) in group A and 25 patients (78.1%) in group B. We revised the relevant
sentence as follows: “Fusion on Worth-4-dot test, at final follow-up, was observed in 76.3% of patients in group A and 78.1% of patients in group B, which difference was not significant (p=0.857)” at page 9, lines 185-186.

2) We are presenting the data on postoperative alignment at each follow-up. Please refer to the table below.

<table>
<thead>
<tr>
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<th>Group A (N=44)</th>
<th>Group B (N=36)</th>
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<td>(Undercorrection/Success/Overcorrection)</td>
<td>(Undercorrection/Success/Overcorrection)</td>
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<tr>
<td>1 month</td>
<td>3/1/0</td>
<td>0/36/0</td>
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<td>3 months</td>
<td>4/40/0</td>
<td>0/36/0</td>
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