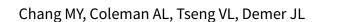


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# Surgical interventions for vertical strabismus in superior oblique palsy (Review)



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#### [Intervention Review]

# Surgical interventions for vertical strabismus in superior oblique palsy

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#### **ABSTRACT**

#### **Background**

Superior oblique palsy is a common cause of vertical strabismus in adults and children. Patients may be symptomatic from binocular vertical diplopia or compensatory head tilt required to maintain single vision. Most patients who are symptomatic elect to undergo strabismus surgery, but the optimal surgical treatment for vertical strabismus in people with superior oblique palsy is unknown.

#### **Objectives**

To assess the relative effects of surgical treatments compared with another surgical intervention, non-surgical intervention, or observation for vertical strabismus in people with superior oblique palsy.

#### **Search methods**

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (which contains the Cochrane Eyes and Vision Trials Register) (2016, Issue 12), MEDLINE Ovid (1946 to 13 December 2016), Embase Ovid (1947 to 13 December 2016), Latin American and Caribbean Health Sciences Literature Database (LILACS) (1982 to 13 December 2016), the ISRCTN registry (www.isrctn.com/editAdvancedSearch); searched 13 December 2016, ClinicalTrials.gov (www.clinicaltrials.gov); searched 13 December 2016, and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictrp/search/en); searched 13 December 2016. We did not use any date or language restrictions in the electronic searches for trials.

#### **Selection criteria**

We included randomized trials that compared at least one type of surgical intervention to another surgical or non-surgical intervention or observation.

### Data collection and analysis

Two review authors independently completed eligibility screening, data abstraction, 'Risk of bias' assessment, and grading of the evidence.

#### Main results

We identified two randomized trials comparing four different surgical treatments for this condition, two methods in each trial. The studies included a total of 45 children and adults. The surgical treatments were all procedures to weaken the ipsilateral inferior oblique muscle. One study compared inferior oblique myectomy to recession of 10 mm; the other study compared inferior oblique disinsertion to anterior transposition (2 mm anterior to the temporal border of the inferior rectus insertion).

We judged both studies to be at unclear risk of bias due to incomplete reporting of methods and other methodological deficiencies.

Neither study reported data on the primary outcome of this review, which was the proportion of participants with postoperative surgical success, defined as hypertropia less than 3 prism diopters (PD) in primary gaze. However, both studies reported the average reduction



in hypertropia in primary gaze. One study found that at 12 months' postoperatively the average decrease in hypertropia was higher in participants who underwent inferior oblique myectomy than in those who underwent recession, however data were not available for statistical comparison. The other trial found that after at least six months of follow-up, the mean decrease in primary position hypertropia was lower in participants who underwent inferior oblique disinsertion than in those who underwent anterior transposition (mean difference (MD) -5.20 PD, 95% confidence interval (CI) -7.76 to -2.64; moderate-quality evidence).

Both trials also reported the average postoperative reduction in vertical deviation in adduction. One study reported that the average reduction in hypertropia in adduction was greater in participants who underwent inferior oblique myectomy than in those who underwent recession, but data were not available for statistical comparison. The other study found a lower decrease in hypertropia in contralateral gaze in participants who underwent inferior oblique disinsertion than in those who underwent anterior transposition (MD -7.10 PD, 95% CI -13.85 to -0.35; moderate-quality evidence).

Secondary outcomes with sufficient data for analysis included proportion of participants with preoperative head tilt that resolved postoperatively and proportion of participants who underwent a second surgery. These outcomes were assessed in the trial comparing inferior oblique anterior transposition to disinsertion; both outcomes favored anterior transposition (risk ratio 7.00, 95% CI 0.40 to 121.39 for both outcomes; very low-quality evidence). None of the participants who underwent inferior oblique anterior transposition or disinsertion developed postoperative hypotropia or reversal of the vertical deviation. All participants who underwent inferior oblique anterior transposition developed elevation deficiency, which the authors deemed to be clinically insignificant in all cases, whereas no participants who underwent inferior oblique disinsertion experienced this complication. Additionally, the trial comparing inferior oblique myectomy to recession reported that no participant in either group required another strabismus surgery during the postoperative period.

#### **Authors' conclusions**

The two trials included in this review evaluated four inferior oblique weakening procedures for surgical treatment of superior oblique palsy. We found no trials comparing other types of surgical procedures for this disorder. Both studies had enrolled a small number of participants and provided low-quality evidence due to limitations in completeness and applicability. We therefore found no high-quality evidence to support recommendations for optimal surgical treatment of superior oblique palsy. Rigorously designed, conducted, and reported randomized trials are needed to identify the optimal surgical treatment for vertical strabismus in this disorder.

#### PLAIN LANGUAGE SUMMARY

#### Surgical treatments for vertical eye misalignment (strabismus) in superior oblique palsy

#### **Review aim**

The aim of this Cochrane Review was to determine whether surgery for vertical strabismus in people with superior oblique palsy works better than other surgical or non-surgical interventions. We searched for all relevant studies and identified two clinical trials.

#### Kev messages

There is no high-quality evidence regarding the effects of surgery on vertical strabismus in people with superior oblique palsy. Consequently, we were unable to determine the best surgery for this disorder. Carefully designed studies are needed to enable treatment recommendations for this common problem.

#### What did we study in this review?

We compared different types of surgery to reduce vertical strabismus in children and adults with a diagnosis of superior oblique palsy. Superior oblique palsy occurs when there is weakness of one of the muscles (superior oblique) involved in eye movement, causing a characteristic pattern of strabismus, or misalignment of the eyes, that usually varies with head positioning. Superior oblique palsy is a common cause of vertical strabismus, and can lead to double vision or abnormal head positioning in order to maintain single vision.

# Main results

Each of the two included trials compared two different surgical procedures to weaken the inferior oblique muscle, and thus balance the weakness in the superior oblique muscle. A total of four different inferior oblique muscle-weakening surgeries were studied: myectomy (removing part of the muscle), recession (moving the muscle to a position where it exerts less force), anterior transposition (moving the muscle to a position where the direction of force is altered), and disinsertion (detaching the muscle from the sclera).

Neither of the trials examined the main outcome we wished to study, that is the proportion of participants deemed to have successful eye realignment after surgery. Additionally, we judged the quality of the data in both studies to be low.

## How up-to-date is this review?

We searched for trials with outcome data published by 13 December 2016. The included trials were published between 2001 and 2003.