Efficacy and complications of external and internal paediatric blepharoptosis repair techniques: a systematic review

HK Lim[1], AZ Lau[2], WN Charles[3], A Khajuria[3, 4]

[1]Oxford University Clinical Academic Graduate School, University of Oxford, [2]The Faculty of Health and Medical Sciences, The University of Western Australia,
[3]Department of Surgery and Cancer, Imperial College London, [4]Nuffield Department of Surgical Sciences, Kellogg College, University of Oxford.

Background

- Blepharoptosis is a non-progressive abnormality of the upper eyelid resulting in a vertical narrowing of the palpebral aperture which may lead to permanent visual complications in paediatric patients
- A choice between external or internal surgical approaches is generally considered in non-severe ptosis and adequate levator function
- Currently numerous modifications have been described for these major blepharoptosis repair techniques leading to non-uniformity in surgical practice

Aim

To review and evaluate the efficacy and complication rates of external and internal blepharoptosis repair techniques in paediatric patients

Methods

- A comprehensive search was conducted of MEDLINE (OVID SP), Embase (OVID SP), Cochrane Central Register of Controlled Trials, and ClinicalTrials.gov to identify relevant studies
- No date or language limitations were applied to the search
- GRADE and ROBINS-I tools were used to assess study quality
- Primary outcomes: measures of the efficacy of blepharoptosis repair, surgical complications and patient-reported outcomes (PROs)
- Secondary outcomes: cosmetic assessments
- The data from included full text articles were extracted independently by 2 authors, with any discrepancies resolved by consensus with a third reviewer
- Data extraction included: first author, year of publication, study design, study setting, study population, duration of follow up, aetiology of blepharoptosis, participant demographics including the study outcomes

Figure 1: GRADE assessment summary of study quality

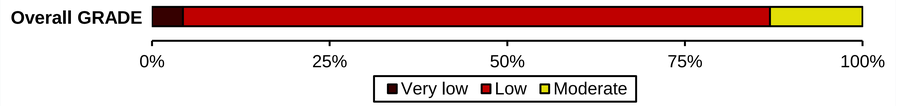


Figure 2: ROBINS-I risk-of bias summary

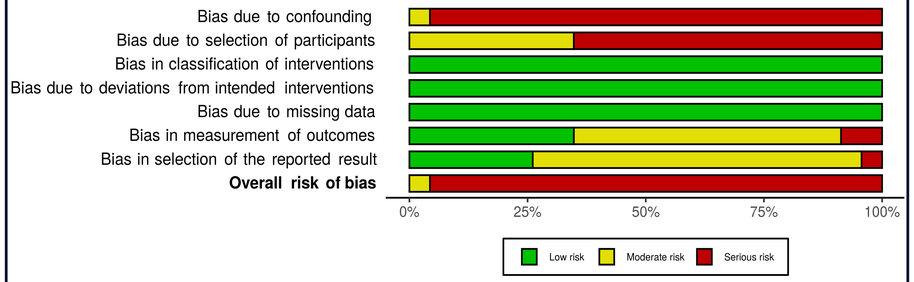
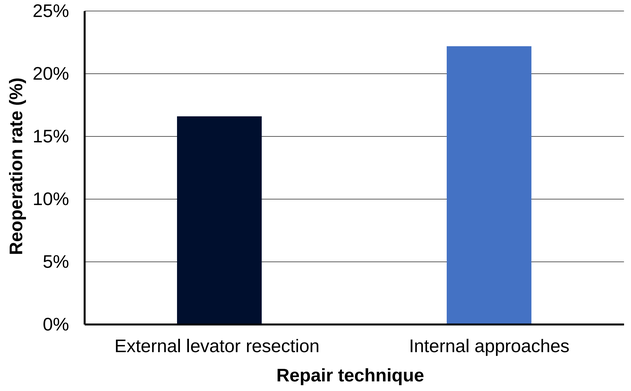


Figure 3: Reoperation rate for external levator resection versus internal approaches



Results

- Of 2,228 records screened, 23 studies involving 730 patients were included
- Overall study quality was low as determined using the GRADE criteria, with overall serious risk of bias according to the ROBINS-I criteria (Figure 1 and Figure 2)
- There was no standardised evaluation of surgical efficacy
- External levator resection (ELR) was evaluated in 18 studies and 7 studies investigated internal approaches
- Reoperation rates were 16.6% (range 3.6–50.9%) for ELR compared to 22.2% (range 0.0–25.8%) for internal approaches (Figure 3)
- 72.7–93.8% of patients with blepharoptosis (n=534) achieved optimum surgical success according to the authors' own definition following ELR
- 88.1% (range 83.3–92.9%) achieved optimum surgical success for the Fasanella-Servat technique and 85.7% for Müller's Muscle-Conjunctival Resection
- The most common post-operative complications were not sight-threatening
- Undercorrection was the most reported complication, occurring at rates of 8.4% (range 2.4–16.7%) for ELR and 15.3% (range 2.7–75.0%) for internal approaches
- No validated PROs or cosmetic outcomes were applied consistently
- The most consistently assessed objective parameter relevant to cosmesis was symmetry defined by the interocular difference in eyelid height or MRD1

Conclusions

- External and internal approaches have been successfully employed in paediatric blepharoptosis repair
- However, poor-quality, non-comparative studies limit the findings
- Prospective studies with standardised outcomes are required to minimise reporting bias, facilitate evidence synthesis and support clinical decision-making