Pars plana vitrectomy for vitreomacular traction syndrome: a systematic review and metaanalysis of safety and efficacy

Jackson TL, Nicod E, Angelis A, Grimalcia F, Prevost AT, Simpson AR, Kanavos P

CRD summary
The authors concluded that, although visual acuity gains after pars plana vitrectomy (eye internal gelatinous vitreous gel surgical removal) for vitreomacular traction (partial vitreous detachment causing visual problems) were modest, they may not fully reflect other visual benefits. These conclusions reflect the results from small non-controlled studies of unknown quality, but the reliability of this evidence is limited and uncertain.

Authors’ objectives
To assess the efficacy and safety of pars plana vitrectomy for vitreomacular traction.

Searching
PubMed, EMBASE and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched up to March 2011. Search terms were reported. Only articles fully published in peer-reviewed journals in English, French or German were included. References of included studies were also checked.

Study selection
Eligible studies included patients with a defined diagnosis of vitreomacular traction and used a clearly described technique of pars plana vitrectomy. Studies had to either report initial and final visual acuity measurements or to categorise eyes as having the same, better or worse visual acuity following treatment. These categorisations needed to be based on the log of the minimal angle of resolution (logMAR), the early treatment of diabetic retinopathy study, or Snellen acuity. Intraoperative and postoperative complications were considered as secondary outcomes. Studies were excluded if the patients had diabetic maculopathy and retinal vein occlusion or an acute onset after cataract surgery. Patients with coexisting epiretinal membrane were included if vitreomacular traction was the primary diagnosis.

Included patients had a mean age of 70.5 years and a mean preoperative visual acuity of 0.67 ± 0.55 (Snellen fraction 20/94). The proportion of men in the studies ranged from 17 to 62% (where reported). There was little additional information about the included patients.

One reviewer selected the studies for the review.

Assessment of study quality
The authors did not state that they assessed the quality of the included studies.

Data extraction
Three reviewers extracted data on acuity and safety outcomes and clinical and methodological characteristics of the included studies, including whether surgery included peeling of the internal limiting membrane.

Methods of synthesis
A formal meta-analysis was not carried out, but the narrative synthesis included calculations of mean visual acuity across the studies. The impact of clinical differences, in particular whether patients had peeling of the internal limiting membrane, was discussed.

Results of the review
Twenty-one studies were included in the review. The number of eyes in each study ranged from five to 100. Follow-up ranged from three to 35 months.

Seventeen studies reported change in mean visual acuity for 255 patients from 259 eyes. Mean postoperative visual acuity across all patients was 0.42 ± 0.45 (20/53) from a baseline of 0.67 ± 0.55 (20/94). All studies showed an improvement in the mean logMAR visual acuity after surgery; in five studies with 20 eyes or more, this had borderline
statistical significance (p=0.0625).

In the subgroup of patients whose eyes did not undergo peeling of the internal limiting membrane (178 eyes), mean improvement in visual acuity was from 0.72 ± 0.46 (20/105) to 0.44 ± 0.37 (20/55), 0.28 logMAR units or almost 2 Snellen lines. In patients whose eyes did undergo peeling of the internal limiting membrane (56 eyes), visual acuity improvement was from 0.64 ± 0.32 (20/87) to 0.41 ± 0.26 (20/51) or 0.23 logMAR units.

Nineteen studies categorised patients’ eyes as having better, worse or same acuity postoperatively (392 eyes) compared with preoperatively. Of these, 9.2% of eyes worsened, 11.7% were unchanged, and 64.3% (217 eyes) improved (incomplete information meant that the totals did not sum to 100%). Of the 64.3% of eyes that showed improvement, 32.9% had an improvement of 2 or more Snellen lines.

Complications were reported by 15 studies. The most frequent intraoperative complications reported were focal, petechial, spontaneously resolving retinal haemorrhage (5.6% of 250 eyes), and peripheral retinal breaks (1.6% of 250 eyes). Most frequent postoperative complications were cataract (34.7% of 304 eyes; this rate almost doubled in eyes known to be phakic (with natural lens). Epiretinal membrane, retinal detachment and recurrence of epimacular membrane were also reported at incidences from 5.7% to 1.4% (348 eyes).

**Authors’ conclusions**

Although the visual acuity gains after pars plana vitrectomy for vitreomacular traction were modest, they may not fully reflect functional visual benefits (symptomatic relief) in other ways.

**CRD commentary**

The review addressed a clear and specific question with criteria which allowed the inclusion of any study design. The search was adequate although language restrictions were used. It was unclear whether review methods were designed to minimise the potential for reviewer bias and error. The authors did not assess validity of included studies, but it was clear that they were all small case series most of which were uncontrolled, meaning that potential for multiple biases was inherent in the study design. A formal statistical synthesis was not presented, as the authors stated this was not possible, but overall means were calculated.

This review is a synthesis of small non-controlled studies of unknown quality. As such the reliability of the evidence on which the authors’ conclusions are based is limited and uncertain.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that future studies should use a validated visual function questionnaire and objective measures of visual distortion. They also recommended the definition of eligible cases of vitreomacular traction using a photographic standard and made specific recommendations for the reporting standards for outcomes.

**Funding**

Thrombogenics; NIHR Biomedical Research Centre at Guys’ and St Thomas' NHS Foundation Trust

**Bibliographic details**


**PubMedID**

24013261

**DOI**

10.1097/IAE.0b013e3182a6b3e2

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Eye Diseases /surgery; Humans; Retinal Diseases /surgery; Tissue Adhesions /surgery; Treatment Outcome; Visual Acuity /physiology; Vitrectomy; Vitreous Body /surgery

**AccessionNumber**
12013053598

**Date bibliographic record published**
24/09/2013

**Date abstract record published**
10/03/2014

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.