DESCEMET STRIPPING AUTOMATED ENDOTHELIAL KERATOPLASTY FOR CORNEAL ENDOTHELIAL DYSFUNCTION

Spanish full text

SUMMARY

Introduction

The main causes of corneal endothelial failure are Fuchs' endothelial dystrophy and aphakic or pseudophakic bullous keratopathy. In the severest cases, the only treatment is corneal transplantation, with penetrating keratoplasty (PK) having been the gold standard over the last 50 years. With the aim of reducing complications arising from this intervention, new techniques have been developed which come within the ambit of so-called endothelial keratoplasty, a procedure characterised by replacing only the posterior layers of the cornea. In this context, Descemet's stripping automated endothelial keratoplasty (DSAEK) is a novel technique with promising results.

Objectives

To assess the efficacy/effectiveness, safety and cost of the DSAEK technique *per se* or in comparison with PK, in patients with corneal endothelial failure.

Methods

A bibliographic search stipulating no time limit was made in October 2012 and updated in January 2013, of papers published in the principal biomedical databases specialising in systematic reviews (Health Technology Assessment, Centre for Reviews and Dissemination, Database of Abstracts of Reviews of Effects, National Health Service Economic Evaluation Database, Cochrane Library Plus) and in general databases such as Medline and Embase.

Results

Of a total of 583 papers retrieved, 20 case series and 2 economic evaluation studies fulfilled the inclusion criteria. Best-corrected visual acuity (BCVA) improved after treatment with DSAEK, with statistically significant results vis-à-vis pre-intervention figures, attaining values of 0.6 to 0.8. Studies which compared DSAEK to PK reported

values of 0.45-0.56 and 0.125-0.38 respectively, with differences that were not always significant. The degree of post-DSAEK astigmatism was not significant and appeared to be better than that achieved with PK.

The main complications were primary failure (0%-12%), endothelial rejection (0.8%-8.5%) and graft dislocation-detachment (1.5%-23%). Nevertheless, success (defined as a clear corneal graft) was 80.4% at five years. In PK, endothelial rejection was the most frequent complication, with rates of 16%.

In terms of effectiveness and safety, outcomes were better in patients having no severe ocular comorbidities.

While one study reported that DSAEK was more cost-effective than PK, another reported that it was more effective but also more expensive than PK or femtosecond laser-assisted DSAEK and, depending on the maximum acceptable payment threshold, both DSAEK and PK could be cost-effective.

Conclusions

- In Fuchs' dystrophy and bullous keratopathy, data on the effectiveness of DSAEK indicate post-intervention improvement in uncorrected and best-corrected visual acuity in relation to baseline values registered prior to the procedure. According to the studies located, post-DSAEK outcomes for BCVA and degree of astigmatism are similar to or even better than those achieved with PK.
- The most important post-DSAEK complications are linked to the viability of the graft, with the most frequent of these being dislocation-detachment and, to a lesser extent, endothelial rejection. In PK, rejection is the most frequent complication.
- In DSAEK, the learning curve is a key factor and is directly linked to the success of the graft transplantation.
- The long-term graft survival rate is similar with both techniques.
- Economic evaluation data show that as compared to PK, DSAEK is a cost-effective technique.

- The studies that assess DSAEK are case series, for the most part retrospective. The methodological quality of such studies tends to be low and limited, and so when it comes to recommending or discouraging the adoption of this technique, their results should be approached with caution.

Recommendations

- In the event of DSAEK being indicated, candidates likely to have better outcomes would be those presenting with no severe ocular co-morbidities. Individualised assessment would be necessary in the case of patients who, due to previous surgery (PK, glaucoma), performance of simultaneous intraoperative interventions and/or severe ocular co-morbidities, displayed a worse prognosis in terms of effectiveness and safety.

- The intervention would have to be performed at centres that were authorised/accredited to perform transplants, and by experienced surgeons because the success rate depends to a great extent on the learning curve.

- To reduce the cost of DSAEK, one alternative could be for pre-cut corneas to be supplied by a reference eye-bank to the various centres that performed the technique.