Transurethral incision compared with transurethral resection of prostate for bladder outlet obstruction: systematic review and meta-analysis of randomized controlled trials

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Authors' objectives
To systematically review all published randomised controlled trials (RCTs) comparing the effectiveness of transurethral prostatic incision and standard transurethral prostatic resection for benign prostatic obstruction.

Searching
MEDLINE, EMBASE, ISI and the Cochrane Library were searched from 1950 to 1999 using the following keywords: 'trial', 'randomized controlled trials', 'randomized controlled trial', 'transurethral incision of prostate', 'incision', 'bladder neck incision', 'benign prostatic hyperplasia', 'transurethral prostatic incision', 'benign prostatic obstruction' and 'transurethral prostatic resection'. In addition, the coordinating editors of the Cochrane Prostatic Diseases and Urologic Cancers Group assisted in locating unpublished studies and non-English publications.

Study selection
Study designs of evaluations included in the review
RCTs were included.

Specific interventions included in the review
Transurethral prostatic incision was compared with transurethral prostatic resection.

Participants included in the review
Men with lower urinary tract symptoms suggestive of bladder outlet obstruction, based on clinical examination or symptom questionnaires. The mean age of the participants included in the review was between 62 and 69 years for those who underwent transurethral prostatic incision, and between 59 and 73 years for those who underwent transurethral prostatic resection. The mean prostate size varied from 15 to 30 g; one study had no limit on prostate size.

Outcomes assessed in the review
The primary outcomes were the urinary symptom score, as measured by the Madsen Iversen scale (see Other Publications of Related Interest no.1), and the maximum urinary flow rate. The secondary outcomes included operative time, blood transfusion rate, duration of post-operative catheterisation, treatment-related adverse events, hospital stay, reoperation rate, and sexual dysfunction. Other recorded outcomes included any measurements of the patient’s view of the outcome.

How were decisions on the relevance of primary studies made?
Three reviewers independently selected the studies for inclusion.

Assessment of study quality
Methodological quality was assessed using a schema developed from Pettiti and Schultz et al. (see Other Publications of Related Interest nos.2-3, respectively). The criteria included: adequate description of population selection; use of sample size calculations; description of screening procedure; start/finish dates of recruitment recorded; method of randomisation stated; description of withdrawals; description of therapeutic regime; defined outcomes; use of appropriate statistical analysis; and description of adverse events. Each of the 12 methodological criteria was scored on a scale of 0 to 3 points, giving a maximum of 36 points (highest-quality trial). It was not stated how many of the reviewers performed the quality assessment, but the report suggested that more than one reviewer was involved.

Data extraction
The data were extracted by one reviewer on two separate occasions. The following types of data were extracted: sample size; inclusion and exclusion criteria; mean age of the participants; prostate size; method of assessing prostate size; the number of incisions and the position of each incision for transurethral prostatic incision; and the timing of follow-up visits.

**Methods of synthesis**

**How were the studies combined?**

Pooled estimates of effectiveness were calculated using a fixed-effect model. Continuous data were combined using the method described by Cochran (see Other Publications of Related Interest no.4), whereas the Peto method (see Other Publications of Related Interest no.5) was used for binary outcomes. Pooled difference estimates (p-values) and weighted mean differences (WMD) were quoted, along with 95% confidence intervals (CIs).

**How were differences between studies investigated?**

A Q test was used to investigate heterogeneity between the studies.

**Results of the review**

Nine RCTs with a total of 691 participants (transurethral prostatic incision, n=346; transurethral prostatic resection, n=345) were included in the review.

Methodological quality of the trials.

None of the trials achieved a score close to the maximum score of 36. The mean score was 18 plus or minus 3 (range: 13 to 23). In general, the studies were weak on the following aspects: justification of sample size; valid generation of randomisation sequences; adequate concealment of allocation; and appropriate handling of study withdrawals, in order to maintain the principle of intention to treat analysis. Most trials scored highly on the following: description of the inclusion or exclusion criteria; description of the procedure used to screen for patients; clearly defined therapeutic regimens; and recording of adverse events.

Urinary symptom score (12 months): there was no significant difference between the two approaches; the WMD was 0.18 (95% CI: -0.76, +1.11, p=0.7; Q=1.79, d.f.=3).

Maximum urinary flow rate (3 months): a significant difference favouring resection was found; the WMD was -4.63 (95% CI: -6.68, -2.59, p<0.0001; Q=5.55, d.f.=3).

Maximum urinary flow rate (12 months): a significant difference favouring resection was found; the WMD was -4.13 (95% CI: -5.99, -2.28, p<0.0001; Q=2.73, d.f.=3).

Operative time: a significant difference favouring incision was found; the pooled difference estimate was -18.7 (95% CI: -21.8, -15.7, p<0.0001; Q=2.67, d.f.=3).

Blood transfusion: a significant difference favouring incision was found; the pooled difference estimate was 0.11 (95% CI: 0.06, 0.19, p<0.0001; Q=0.63, d.f.=4).

Catheterisation duration: there was no significant difference between the two approaches; the pooled difference estimate was 0.46 (95% CI: -0.31, +1.23; p=0.20, Q=3.39, d.f.=1).

Hospital stay: a significant difference favouring incision was found; the pooled difference estimate was -1.4 (95% CI: -2.7, +0.2, p=0.05; Q=3.0, d.f.=2).

Adverse events: a significant difference favouring incision was found; the pooled difference estimate was 0.41 (95% CI: 0.24, 0.70, p<0.0001; Q=4.69, d.f.=5).

Reoperation: there was no significant difference between the two approaches; the pooled difference estimate was 1.65 (95% CI: 0.84, 3.23, p=0.10; Q=9.78, d.f.=7).
Retrograde ejaculation: a significant difference favouring incision was found; the pooled difference estimate was 0.12 (95% CI: 0.06, 0.23, p<0.0001; Q=4.11, d.f.=4).

Subjective reported overall improvement: there was no significant difference between the two approaches; the pooled difference estimate was 1.21 (95% CI: 0.70, 2.10, p=0.50; Q=4.07, d.f.=5).

**Authors' conclusions**

In the first 12 months after surgery, transurethral prostatic incision offered an equivalent effectiveness to transurethral prostatic resection for the treatment of patients with suspected benign prostatic obstruction, who have a relatively small prostate. However, there was little evidence on the relative long-term effectiveness of the two treatments, 2 to 5 or 10 years after surgery. There does not appear to be a clear cut-off point for prostate size that leads to good results after transurethral prostatic incision.

**CRD commentary**

This was a well-presented review with clearly stated objectives and methodology. The search strategy was extensive and also incorporated databases containing both non-English language papers and unpublished material. Therefore, the risk of publication bias is likely to be low. In addition, most stages of the review process were carried out by more than one reviewer, which also reduces the risk of selection bias. However, the data were extracted by only one reviewer, although the process was repeated on a separate occasion in order to reduce the risk of reporting bias.

Only RCTs were included in the review, and the reviewers also rigorously assessed the individual methodological quality of the trials. This data and the outcome data were tabulated. However, tables 2 and 5, which report the primary and secondary outcome data respectively, may be slightly confusing as the last column fails to make it clear that it relates to the significance of the observed difference between the two interventions. The data were combined appropriately using a meta-analysis, and the presence of heterogeneity was assessed statistically. Overall, based on the data presented, the reviewers' conclusions and recommendations for future research appear reasonable.

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

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

Research: The authors state that ‘a large scale, multi-centre randomised controlled trial is now required to evaluate comprehensively the effectiveness, impact on quality of life and overall cost of transurethral prostatic incision compared with transurethral prostatic resection’.

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**Other publications of related interest**


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