Endoscopic thyroidectomy: an evidence-based research on feasibility, safety and clinical effectiveness
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CRD summary
The review concluded that endoscopic thyroidectomy was a feasible, practical and safe procedure for treating thyroid tumours, with cosmetic and postoperative advantages compared with conventional thyroidectomy. Multiple limitations, including the possibility of publication bias, the poor reporting of review processes and the unclear quality of included studies, mean that the reliability of this conclusion is uncertain.

Authors' objectives
To compare the feasibility, safety and effectiveness of endoscopic thyroidectomy with conventional thyroidectomy for the treatment of thyroid tumours.

Searching
MEDLINE, Cochrane Database of Systematic Reviews, American College of Physicians Journal Club, DARE and Cochrane Central Register of Controlled Trials (CENTRAL) were searched. Search dates were varied across sources, spanning January 1997 to December 2006. Search terms were reported. Reference lists of identified articles were handsearched.

Study selection
Comparative studies (randomised controlled trials - RCTs or controlled clinical trials - CCTs) that compared outcomes in patients who had undergone endoscopic thyroidectomy (video-assisted thyroidectomy or totally endoscopic thyroidectomy) with conventional thyroidectomy were eligible for inclusion. Non-comparative (case-series) studies that reported on endoscopic thyroidectomy alone were also eligible for inclusion. Studies where sample sizes were less than 20, or where data was not reported on an intention-to-treat basis, or where details of perioperative data was not provided, were excluded.

Outcomes considered were: perioperative outcomes (including operative times, specimen size, length of hospital stay); complication rates (including transient recurrent laryngeal nerve palsy, permanent recurrent laryngeal nerve palsy, hypocalcaemia); post-operative pain (assessed using a visual analogue scale - VAS); and cosmetic satisfaction (assessed using a 10-point numeric scale).

Procedures considered in the included studies were video-assisted thyroidectomy, totally endoscopic thyroidectomy and conventional thyroidectomy. The majority of the patients were female. The mean age of patients in the comparative studies ranged from 43.6 to 44.9 years. The most common diagnoses were goitre and thyroid adenoma. Most of the operations involved unilateral thyroid dissection.

The authors did not state how the papers were selected for review, or how many reviewers performed the selection.

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

Data extraction
Data on perioperative outcomes, postoperative pain, complication rates and cosmetic satisfaction were extracted in order to calculate risk ratios (RRs), weighted mean differences (WMDs) or standardised mean differences (SMDs) and their corresponding 95% confidence intervals (CIs).

Data extraction was carried out independently and any disagreements were resolved by discussion; it was unclear how many reviewers were involved.
Methods of synthesis
The pooled risk ratios, weighted mean differences and standardised mean differences, and corresponding 95%
confidence intervals, in ‘comparative’ studies were calculated using a random-effects model where heterogeneity was
detected (I² test, p<0.05); otherwise the fixed-effects model was used. For ‘non-comparative’ studies, categorical
outcomes (e.g. complication rates) were compared using X² tests; quantitative outcomes (e.g. operative times) were
compared using t-tests.

Results of the review
Ten ‘comparative’ studies (five RCTs with 275 patients and five CCTs with 365 patients) and 31 ‘non-comparative’
studies (case series studies with 3,256 patients) were included in the review.

Comparative studies (n=640 patients);
Perioperative data: The mean operative time for video-assisted thyroidectomy was significantly longer than for
conventional thyroidectomy (80.0 minutes versus 61.9 minutes; p<0.01; six trials); totally endoscopic thyroidectomy
mean operative time was also significantly longer compared with conventional thyroidectomy (143.4 minutes versus
108.8 minutes; p=0.04; three trials). The mean tumour specimen size for video-assisted thyroidectomy was
significantly smaller than for conventional thyroidectomy (24.4mm versus 28.5mm; p=0.04; five trials); totally
endoscopic thyroidectomy mean specimen size was also significantly smaller compared with conventional
thyroidectomy (34.2mm versus 37.8mm; p=0.02; three trials).

Postoperative data: The length of hospital stay for video-assisted thyroidectomy patients was slightly shorter than for
conventional thyroidectomy patients (1.7 days versus 2.5 days; p<0.01; four trials); totally endoscopic thyroidectomy
patients hospital stay was also slightly shorter compared with conventional thyroidectomy patients (5.1 days versus 6.3
days; p<0.01; three trials). There was no difference in the rates of complication between endoscopic thyroidectomy
and conventional thyroidectomy procedures. There was no significant difference in the degree of postoperative pain
between the endoscopic thyroidectomy and conventional thyroidectomy procedures (three RCTs). There was no
significant difference in cosmetic satisfaction video-assisted thyroidectomy patients compared with conventional
thyroidectomy patients (three RCTs). No mortality was reported in either group

Non-comparative studies (18 studies of video-assisted thyroidectomy; 14 studies of totally endoscopic thyroidectomy)
Perioperative data: The operative time was significantly longer for totally endoscopic thyroidectomy compared with
video-assisted thyroidectomy (135.8 minutes versus 76.8 minutes; p<0.01). The tumour specimen sizes were larger in
the totally endoscopic thyroidectomy group compared with the video-assisted thyroidectomy group (34.7mm versus
22.9mm; p<0.01).

Postoperative data: The mean postoperative length of hospital stay was significantly longer for totally endoscopic
thyroidectomy patients compared with the video-assisted thyroidectomy patients (3.8 days versus 1.8 days; p<0.01).
The complication rate was significantly lower after totally endoscopic thyroidectomy compared with video-assisted
thyroidectomy (3.5% versus 8.6%; p<0.01). No mortality was reported in either group.

Authors' conclusions
Endoscopic thyroidectomy was a feasible, practical and safe procedure with cosmetic and postoperative advantages.

CRD commentary
The authors did not clearly specify eligible study designs, participants and outcomes. Several relevant databases were
searched. No efforts were made to search for unpublished studies, and it was unclear whether non-English publications
were considered; therefore the possibility of language and publication bias could not be excluded. Study selection and
data extraction processes were incompletely reported, raising the risk of reviewer error and bias.

Study quality assessment was not reported. Incomplete reporting of results and unexplained heterogeneity made it
difficult to ascertain the appropriateness of statistical methods used to combine data. The conclusions reflected the
evidence presented.
Given multiple limitations in the review methods (possibility of language and publication bias, poor reporting of review processes, unclear quality of included studies), the reliability of the conclusion is uncertain, and it should be treated with caution.

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

Practice: The authors stated that endoscopic thyroidectomy should be considered a valid option for treating thyroid tumours, and that caution is warranted in the selection of patients as the surgical teams become accustomed to the procedure.

Research: The authors did not state implications for research.

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