Systematic review and meta-analysis of the adverse effects of thyroidectomy combined with central neck dissection as compared with thyroidectomy alone

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CRD summary
This review concluded that the only increased adverse outcome of performing the central neck dissection in addition to thyroidectomy was temporary hypocalcaemia. There was no increased permanent morbidity by performing the procedure at the same time as thyroidectomy. Given a lack of formal study validity assessment and other methodological concerns in the review methods, these conclusions may be not reliable.

Authors' objectives
To compare the adverse effects of thyroidectomy combined with a central neck dissection versus thyroidectomy alone in patients with thyroid cancer.

Searching
PubMed and the Cochrane Library were searched for studies published in English language up to September 2008. Search terms were reported.

Study selection
Retrospective and prospective studies that compared adverse outcomes of thyroidectomy combined with a central neck dissection versus thyroidectomy alone in patients with any thyroid cancer subtype were eligible for inclusion.

The primary outcomes reported in the review were postoperative hypocalcaemia and vocal cord palsy (both temporary and permanent). Secondary outcomes included postoperative haemorrhage and mortality.

All the included studies were retrospective. The included studies had a heterogeneous mix of cancer and benign cases. The majority of patients had papillary carcinoma. The definition of hypocalcaemia varied between studies. Procedures in included studies were performed in the same unit(s) by the same surgeon(s).

Two reviewers independently assessed studies for inclusion, with any disagreement resolved by discussion.

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

Data extraction
Event rates were extracted to enable the calculation of risk differences (RDs) and 95% confidence intervals (CIs).

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
The studies were combined in a meta-analysis. The pooled risk differences with 95% confidence intervals were calculated. The authors stated that a random-effects model was used in the presence of relatively high heterogeneity; otherwise a fixed-effects model was employed. However, it appeared that a fixed-effect model was used for both conditions. Statistical heterogeneity was assessed using $X^2$ and $I^2$ statistics.

Results of the review
Five studies were included in meta-analyses (n=1,130). Overall, 398 patients had total thyroidectomy with central neck dissection and 732 underwent thyroidectomy alone. The sample size varied from 100 to 447 patients.

Compared with thyroidectomy alone, the addition of central neck dissection to thyroidectomy was associated with a significant increased risk of temporary hypocalcaemia (RD 0.13, 95% CI 0.07 to 0.18; five studies). There were no
significant differences in the rates of permanent hypocalcaemia, temporary or permanent vocal cord palsy between the two groups. Significant heterogeneity was only observed in the outcome of permanent hypocalcaemia ($I^2=57\%$).

Where reported, the rates of postoperative haemorrhage ranged from 1 to 2\%, with no significant differences between the two groups. There were no postoperative mortalities.

**Authors' conclusions**
The only increased adverse outcome of performing the central neck dissection in addition to thyroidectomy was temporary hypocalcaemia. There was no increased permanent morbidity by performing the procedure at the same time as thyroidectomy.

**CRD commentary**
The review question was clear and inclusion criteria were detailed for all aspects except outcomes. Relevant sources were searched. Efforts were made to find published studies but not unpublished studies, introducing the potential for publication bias. The restriction of the search to English-language studies may have increased the risk of language bias. Steps were taken to minimise biases and errors by having more than one reviewer independently undertake the study selection, but it was unclear whether the data extraction process was also performed in duplicate.

A formal validity assessment of included studies was not carried out. Statistical heterogeneity was assessed, but using a fixed-effects model to pool the results in the presence of significant heterogeneity might not have been appropriate.

The authors' conclusions reflected the evidence presented. However, a lack of formal validity assessment and other methodological concerns in the review methods, mean that the authors' conclusions may be not reliable.

**Implications of the review for practice and research**
**Practice:** The authors stated that the central neck dissection in addition to thyroidectomy is a safe procedure when carried out by experienced surgeons with temporary hypocalcaemia managed appropriately.

**Research:** The authors did not state any implications for research.

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