Routine drainage after thyroid surgery a meta-analysis
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CRD summary
This meta-analysis of eleven RCTs concluded that routine use of drains following thyroid surgery did not prevent neck haematoma or seroma and was associated with a longer hospital stay. Although the review processes were not clearly reported and the findings for hospital stay were not explored fully, the review conclusions are likely to be reliable.

Authors' objectives
To evaluate the beneficial or harmful effects of routine drainage after thyroidectomy on neck haematoma or seroma and the length of hospital stay.

Searching
Cochrane Central Register of Controlled Trials, PubMed, EMBASE, LILACS and Science Citation Index Expanded databases were searched from inception to February 2006 with no language restrictions. Key search terms were listed. Authors of included studies were contacted for information on unpublished or ongoing studies. Reference lists of identified trials were scanned.

Study selection
Randomised controlled trials (RCTs) that compared active postoperative drainage (closed wound suction) to no drainage in adult patients undergoing total or partial thyroidectomy were eligible for inclusion in the review. Eligible patients had a pre-operative diagnosis of benign, intermediate or malignant disease of the thyroid. Studies including patients who needed radical or modified radical neck dissection, patients with giant goitres and patients undergoing parathyroidectomy were excluded. The primary outcome included in the review was neck haematoma or seroma detected clinically or by imaging. The secondary outcome was length of hospital stay. Both outcomes had to occur during the hospitalisation period or within 30 days of discharge to be included in the review.

All except one of the included studies assessed patients undergoing partial thyroidectomy. Just over half the studies also assessed patients undergoing total thyroidectomy. Where stated, most patients had benign disease. Around half of the included studies assessed patients with either benign or malignant disease.

The authors stated neither how the studies were selected for inclusion in the review nor how many reviewers selected the studies.

Assessment of study quality
Each included study was assessed as adequate, inadequate or unclear on each of the following criteria: method of randomisation; allocation concealment; blinding; loss to follow-up; and intention to treat analysis. The authors did not state how many reviewers performed the validity assessment.

Data extraction
The authors state neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Outcome data were extracted on the number of patients who experienced postoperative neck haematoma or seroma, and on mean length of hospital stay and associated standard deviation. Effect estimates and 95% confidence intervals (CIs) were calculated for each study: odds ratios (ORs) for dichotomous data (incidence of either neck haematoma or seroma) and mean difference for continuous data (length of hospital stay).

Methods of synthesis
Pooled odds ratios (ORs) for dichotomous data and weighted mean differences for continuous data, with 95% confidence intervals (CIs), were calculated using a random-effects model.

Statistical heterogeneity was assessed using the $X^2$ and the degree of heterogeneity was quantified using the $I^2$ statistic.
Significant heterogeneity was assumed if the $\chi^2_p < 0.10$. Causes of heterogeneity were examined subjectively. A sensitivity analysis including only studies of high methodological quality was carried out.

Publication bias was assessed using the adjusted rank correlation (Begg) test and regression using the asymmetry (funnel plot) test.

**Results of the review**

Eleven RCTs (1,244 patients; 617 in the drainage group and 627 in the group without drainage) were included in the review.

**Validity**: only three studies were assessed as having adequate randomisation and allocation concealment. Although participants and clinicians could not be blinded, only one study used blinded outcome assessment. All studies were assessed as adequate for follow-up, dropouts and intention to treat analysis.

**Primary outcome**: 22 of 617 (5.35%) of people in the drainage group and 30 of 627 (4.78%) people in the no drainage group developed a postoperative neck haematoma or seroma. The difference between groups was not statistically significant (OR 1.06, 95% CI 0.62 to 1.82; 11 RCTs). There was no statistical heterogeneity in the pooled result.

**Secondary outcome**: Data were available for only six RCTs. The length of hospital stay was statistically significantly longer in the drainage than the no drainage group (MD 1.48 days, 95% CI 1.35 to 1.62). There was significant heterogeneity in the pooled result ($p<0.01, I^2=88\%$).

Publication bias was not detected.

A sensitivity analysis that included only studies of good methodological quality did not make any difference to the results.

**Authors’ conclusions**

The authors concluded that the review did not demonstrate any advantage of routine drainage with regard to prevention of postoperative haematoma or seroma and it increased the length of hospital stay.

**CRD commentary**

This review addressed a clear research question with explicit inclusion criteria. The literature search was comprehensive and attempts were made to locate unpublished and non-English language studies. The main flaw of this review was that the lack of a description of the review process (such as how many reviewers selected studies and performed data extraction and validity assessment), which meant that bias or error could have been introduced at these stages.

Quality assessment of included studies was carried out and the results reported and used in a sensitivity analysis. Pooling and presentation of the results were clear and the potential for publication bias was assessed and discounted. However, no attempt was made to explore or explain the statistical heterogeneity present in the secondary outcome. This meant that the findings of the review for length of hospital stay should be treated with caution.

Despite lack of reporting of the review processes, the overall review conclusions are likely to be reliable.

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

**Practice**: The authors noted that using drains committed the patient to an overnight stay (at least) in hospital.

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

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