

Review Article

The use of drains following thyroid and parathyroid surgery: a meta-analysis

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Abstract

The use of suction drains following thyroid and parathyroid surgery is controversial. Although there have been several prospective and retrospective studies carried out on this subject, no paper had sufficient power to provide a suitable answer to whether or not drains should be used routinely. We present the first formal meta-analysis of the data from eight randomized controlled trials on this subject. The result of the meta-analysis showed that there is no difference in complication rates between patients in whom drains have been used routinely and those in whom they have not.

Key words: Thyroidectomy; Drainage; Suction; Meta-analysis; Thyroid; Surgery

Introduction

The routine use of suction drainage following thyroid and parathyroid surgery is controversial. Supporters of routine drainage argue that drainage will reduce post-operative collections and reduce the likelihood of haematomas that may cause compression of the airway or become infected. Those who do not use drains argue that drains often become blocked which limits their usefulness, and that the drain itself may cause increased bleeding from trauma to the wound bed or that they may increase infection rates. In addition, Peix *et al.*¹ showed that patients in whom drains have been inserted post-operatively have longer stays in hospital.

Debry *et al.*² performed a brief review of the literature along with their randomized controlled trial (RCT) during which an attempt was made to combine the results of similar RCTs, but no formal meta-analysis has been performed on the papers mentioned by these authors or those published since then. Also, Debry *et al.* included the study by Schwarz *et al.*,³ which compares gravity with suction drainage, in their analysis, a study that should have been excluded. Since this review, other high-quality trials have been published which add significantly to a systematic review of the data on this subject; a formal review and meta-analysis of RCTs is presented.

Methods

A protocol was specified before undertaking the review and no deviation was made from the protocol.

RCTs assessing complications associated with thyroid or parathyroid surgery where suction drainage was compared to no drainage were eligible for inclusion. All material published in peer-reviewed journals was considered, with no restrictions on date or language. Studies that compared different types of drainage without a non-drain control were excluded.

Medline (1966 – January 2005), Cochrane Controlled Trials Register, EMBASE and general online searches were performed. The following search terms were used in combination.

MeSH terms:

- 1) Thyroidectomy
- 2) Thyroid*
- 3) Drainage
- 4) Drain*
- 5) Review
- 6) RCTs
- 7) Prospective studies

MeSH subheadings and non-MeSH terms:

- 1) Complications
- 2) Randomized

Where data were missing from the original articles, authors were contacted directly to ensure that all data

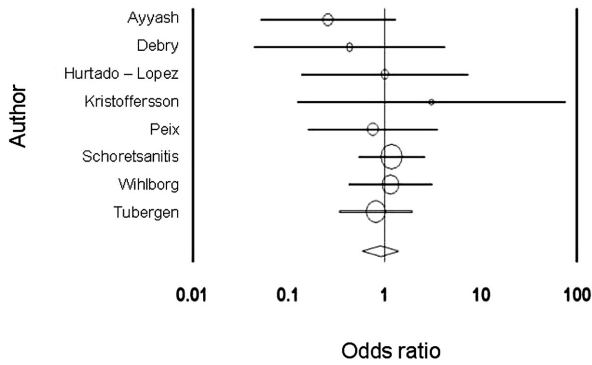


FIG. 1

Risk of drain insertion after thyroid or parathyroid surgery. Odds ratios and 95 per cent confidence intervals plotted for risk of complications.

reviewed were reliable and consistent. Reference lists from the selected studies were then checked to identify further studies that were missed during standardized searching.

Results

Twenty-eight studies of drainage following thyroid and parathyroid surgery were identified, comprising nine RCTs^{1,2,4-10} and 11 retrospective analyses or non-randomized trials.¹¹⁻²¹

Nine RCTs were identified that fitted the criteria for inclusion in the meta-analysis. Two of the studies seemed to contain identical data: Peix *et al.*¹ and Teboul *et al.*²² had a similar list of authors and an identical number of participants. These two papers were published in the same year, but the Peix paper was published in an English language journal (*Annals of Surgery*) while the Teboul paper was published in French (*Annales de Chirurgie*). As identical data were presented, the Teboul paper was excluded from the meta-analysis in favour of the paper in English.

All papers were published between 1986 and 2001. All the studies were relatively small with the largest having 200 participants divided into two groups of 100 each.⁷ All of the studies selected showed no significant difference between patients who had drains inserted and those who did not. Table I gives a summary of the studies entered into the meta-analysis.

TABLE I

NUMBER OF PARTICIPANTS IN THE RCTS INCLUDED IN THIS META-ANALYSIS

Authors	Patients with drain	Patients without drain
Ayyash <i>et al.</i> ⁴	50	50
Debry <i>et al.</i> ⁷	43	57
Kristoffersson <i>et al.</i> ⁵	50	50
Peix <i>et al.</i> ¹	48	49
Wihlborg <i>et al.</i> ⁶	75	75
Schoretsanitis <i>et al.</i> ⁷	100	100
Hurtado-Lopez <i>et al.</i> ⁸	50	50
Tubergen <i>et al.</i> ⁹	52	48

Meta-analysis

The complication rates of the eight RCTs were analysed and the results from individual studies were combined on an odds ratio (OR) scale. The ORs were calculated from published data and were not weighted with co-variables. Results are presented as an OR and 95 per cent confidence intervals (CI). All calculations were performed using Comprehensive Meta Analysis Version 1.0.23 (Biostat 2000).

- This meta-analysis reviews the literature on the use of suction drainage following thyroid surgery
- There appears to be no difference in complication rates between patients in whom drains have been used routinely and in those in whom they have not

Figure 1 shows a Forrest plot of the studies included in the meta-analysis. The combined OR for the eight studies was a 0.89-fold effect in favour of drainage (95 per cent CI 0.576–1.391; $p = 0.623$) which was not statistically significant.

Discussion

The routine use of suction drains following thyroid or parathyroid surgery is open to debate. Retrospective reviews have been undertaken where drains have been used or avoided by the same surgeon, but these are of little scientific value as the bias associated with this type of study is potentially very high. Tabaqchali *et al.*¹⁷ encountered this phenomenon during their retrospective review. In spite of this bias, most of the retrospective studies show no obvious difference between the drained and undrained groups in their series.^{13,15,16}

Authors who have published their results from large series of procedures offer conflicting advice. Ardito *et al.*¹¹ in their analysis of over 1000 drained thyroid operations advise on routine drainage, while Ariyanayagam *et al.*¹⁹ report on their series of 250 patients in whom no drains were used at all, and recommend that drains should not be used routinely.

None of the eight RCTs included in this meta-analysis show a significant difference between groups and even the combined data show no benefit from drainage or no drainage. For this reason, the routine use of suction drains following thyroidectomy is not supported by this review. Despite this, however, a case can be made for complicated surgery being an important exception. Retrosternal goitres or accompanying neck dissections were not included in the studies in this review, and no data are available to determine whether drains should be routinely placed in these patients, although with increased levels of dead space, the case for routine drainage in this setting is strong.

In conclusion, a meta-analysis of eight RCTs shows that there is no significant difference in

complication rates between patients who have routine suction drainage following thyroidectomy and those who do not.

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Mr D Pothier takes responsibility for the integrity of the content of the paper.

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