

Review

Total thyroidectomy versus lobectomy as initial operation for small unilateral papillary thyroid carcinoma: A meta-analysis



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ABSTRACT

Introduction: Consensus guidelines have recommended total thyroidectomy for papillary thyroid carcinoma (PTC) > 1 cm. However, the optimal surgical approach for small and unilateral (≤ 1 cm) PTC remains controversial.

Methods: A meta-analysis was performed using MEDLINE and EMBASE databases to identify all studies investigating at thyroid surgery options, total thyroidectomy (TT) versus thyroid lobectomy (TL), for PTC ≤ 1 cm. The primary endpoints were locoregional recurrence and mortality rates.

Results: The initial literature search identified 305 publications (1980–2014). Six studies met the inclusion criteria comprising 2939 patients (2002–2013). Among these patients, 2134 (72.6%) underwent TT and 805 (27.4%) underwent TL. Mean follow-up was 10.9 ± 3.4 years (range, 1 month to 54 years). Overall, the recurrence rate was 5.4%: 4.4% in the TT group and 8.3% in the TL group ($p < 0.001$; RR 0.50, 95% CI 0.37–0.67). The mortality rates were 0.3% (8 cases) versus 1.1% (9 cases) in TT and TL groups, respectively ($p = 0.14$; RR 0.43, 95% CI 0.17–1.09).

Conclusion: TT was associated with lower recurrence rates, possibly due to a more complete nodal dissection of the central neck compartment at the time of initial surgery. Based on these data, it is unclear to establish a definitive correlation between the extent of thyroid resection and long-term survival rates due to the small number of mortality events. However, there is a trend toward lower mortality rates in the TT group. Other factors need to be taken into consideration while planning thyroid resection for small PTC, such as multifocality, locoregional involvement, mode of presentation and age at diagnosis. Refinement of current guidelines for the optimal surgical management of PTC <1 cm may be warranted.

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Introduction

Papillary thyroid carcinoma (PTC) is the most common malignancy arising from the thyroid gland. Its incidence has increased remarkably over time secondary to an increase in its actual occurrence and improvement in the detection of small PTC [1,2]. The

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superior diagnostic techniques, including high-resolution ultrasound (US) and US-guided fine-needle aspiration (FNA) cytology, has enabled the diagnosis of small lesions undetectable on clinical examination [3]. Papillary thyroid microcarcinoma (PTMC) is defined as PTC with tumor diameter of 1 cm or less [4]. It is identified at autopsy in up to 35% of cases from benign diseases, which suggests a benign behavior [5].

For decades, there has been a debate regarding the optimal surgical management of PTC. Randomized clinical trials involving the surgical approach for PTC are impractical and have not been carried out because they would require a large number of patients to be followed for an extended period of time [6]. Based on recent retrospective data, consensus guidelines advocate total thyroidectomy (TT) for PTC > 1 cm with improved recurrence and long-term survival rates compared to thyroid lobectomy (TL) [7,8]. However, PTMC may also be associated with aggressive tumor characteristics, such as multifocality, extrathyroidal extension and lymph node metastasis, and its mortality rates are increasing for certain subgroups [9]. The rate of locoregional recurrence of PTMC has been reported as 8% after TL [10], and this may lead to a 3-fold higher disease-related long-term mortality rate [11].

In this review, we systematically evaluate the extent of thyroid resection on locoregional recurrence and long-term mortality rates in patients with PTC less than 1 cm, aiming at discussing potential improvements in the current recommendations for the management of PTMC.

Methods

A systematic review was performed in accordance with the guidelines proposed by the Preferred Reporting Items for

Systematic Reviews and Meta-Analysis (PRISMA) [12]. Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, EMBASE, and MEDLINE (PubMed) were searched using a combination of the following MeSH terms: 'thyroid neoplasms', 'papillary thyroid cancer', 'thyroidectomy', 'survival' and keywords 'thyroid lobectomy', 'well-differentiated thyroid cancer' with limits "human" and published in the English literature. PTMC were defined as any papillary thyroid carcinoma with greatest tumor diameter ≤ 1 cm. Abstracts obtained from electronic searches identified potential relevant studies from 1980 to 2014 and were printed for analysis of significance. Full text articles were obtained for those studies considered potentially relevant. Exclusion criteria included patients <18 years of age, recurrent thyroid cancer, distant metastatic disease, and patients undergoing completion thyroidectomy. Letters to the editor, abstracts, reviews and non-English studies also were excluded. (Fig. 1) Patients were classified in two broad categories: "total thyroidectomy" (bilateral resection including total, near-total, and subtotal) and "lobectomy" (unilateral resection including lobectomy with or without isthmusectomy). The primary outcomes of interest were locoregional recurrence and long-term mortality rates.

A random-effect model was used to pool the data from the included studies into a meta-analysis. A random-effect model formally considers study heterogeneity as part of its calculation. Comparisons between groups' characteristics were made using Fisher's exact test. P-values less than 0.05 were considered statistically significant. Relative risk (RR) with 95% confidence interval (CI) for studies' comparison group and weighted pooled estimates of proportion with 95% CI are presented. Review Manager version 5.1 (www.cochrane.org) was used for data analysis. Weighted mean was calculated to summarize the mean values from the studies.

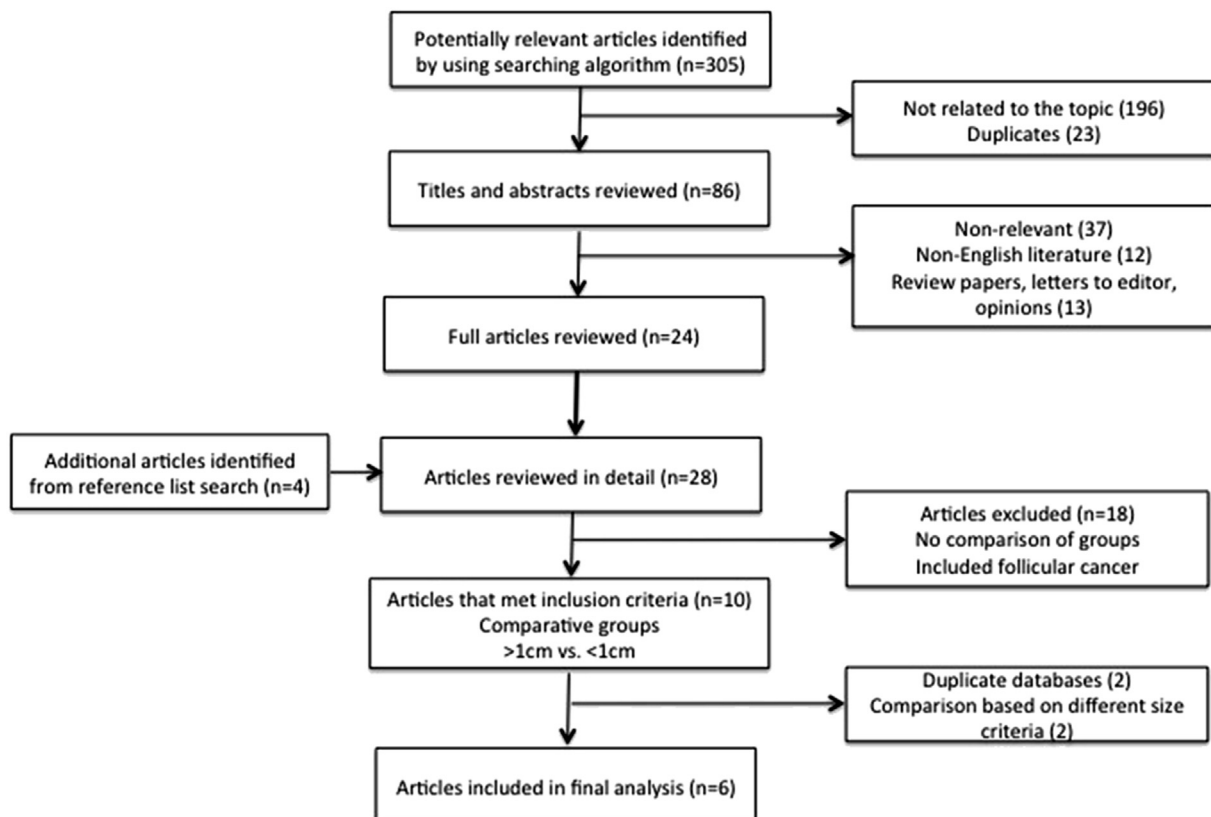


Figure 1. Flow diagram of literature search.

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