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Research Article

The Best Time for Completion Thyroidectomy on Differentiated Thyroid Carcinoma: A Literature Review

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Abstract

Background: Completion thyroidectomy is performed for high-risk differentiated thyroid carcinoma; however, the timing of the completion thyroidectomy is a matter of controversy. The current review aimed to assess the best time for completion thyroidectomy in patients with differentiated thyroid carcinoma.

Methods: An electronic search was conducted in various databases, such as Pub Med, Google Scholar, Scopus, and Medline, for relevant articles assessing the timing of completion thyroidectomy from the first published article to October 2019. Keywords, "completion thyroidectomy" and "timing" were used. The search was limited to articles published in the English language. Among the 190 articles retrieved, only 11 fulfilled the inclusion criteria.

Results: Of the 11 articles included, two were from Europe, one from Africa, one from Australia, and seven from Asia, and all were retrospective studies with the mean duration of studies being 12.71 ± 12.31 years. Five studies (45.5%) showed no effect of timing on the outcomes, two (18.2%) recommended both early and late operation, another two (18.2%) concluded that late operation is better, one (9.1%) found that early surgery is better, while one study (9.1%) stated that the timing of operation should be based on the category of the patient.

Conclusions: The results were mixed with some studies recommending late completion thyroidectomy, some observing that both early and late thyroidectomy are safe, while some finding no effect of time on the completion thyroidectomy. Well-designed controlled trials will resolve the issue.

Keywords: early completion thyroidectomy, late thyroidectomy, timing

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1. Introduction

The type of surgery in differentiated thyroid carcinoma is controversial; many authors recommend total thyroidectomy due to the rare metastatic potential, recurrence, morbidity of the second operation, and the effectiveness of radioactive iodine. On the other hand, a conservative approach is recommended based on the observations that the clinical course is not affected by the multifocal disease, anaplastic transformation is

very low (<1%), and radioactive iodine therapy is possible with low morbidity [1]. While there is a debate on what needs to be done in patients with lobectomy (conservative approach) during the first operation, a completion thyroidectomy is often suggested in high-risk patients [2] to remove the remaining thyroid tissue after the first surgery when malignancy is found. Due to inflammation, edema, and scarring after the first operation, the completion of thyroidectomy is thought to carry a high risk of complications including recurrent laryngeal nerve palsy and hypoparathyroidism due to loss of landmarks [3, 4]. An early completion thyroidectomy is typically the operation conducted within seven days post lobectomy, while a late operation is the one conducted after three months [5]. Although the timing of the second operation is critical, the best time remains uncertain. Thus, we conducted the current review to assess the timing of completion thyroidectomy in patients with differentiated thyroid carcinoma.

2. Materials and Methods

2.1. Eligibility criteria according to PICOS

We included all articles investigating the timing of completion thyroidectomy, the participants were adult patients with differentiated thyroid carcinoma who underwent completion thyroidectomy. With regards to the outcome measures, all manuscripts that compare early and late completion thyroidectomy in terms of operation complications, recurrence rate, and mortality between the two groups were included. Manuscripts published on surgery other than completion thyroidectomy timing were excluded from the review.

2.2. Information source and search methods

Databases such as Pub Med, Scopus, Medline, and Google Scholar were searched for relevant articles including those in press starting from the first published articles to those published until October 2019. The terms used for the search were: “completion thyroidectomy” OR “thyroid reoperation” AND “timing”. In the current review, the filter was set to English language publications among adults.

2.3. Data extraction and study selection

The abstracts and full articles were screened manually for relevant articles; clearly, irrelevant manuscripts were excluded according to the inclusion and exclusion criteria. The authors' name, year of publication, country, type of study, number of patients, and the duration of the study were reported (Table 2). For the purpose of the current review, an early completion thyroidectomy is defined as an operation within the first seven days post the first operation, while a late thyroidectomy is the one conducted after three months.

2.4. Assessment of risk of bias in the included articles

The Newcastle–Ottawa scale for cross-sectional studies was used to assess the quality of the selected studies (Table 1).

Figure 1 shows the different phases of the systematic review.

3. Results

A total of 190 studies were identified through the database search. Next, the duplicate manuscripts were removed and 20 papers were shortlisted, finally, only 11 full-text articles meeting the inclusion criteria of the review were included: (two [18.2%] papers were from Europe, one [9.1%] from Africa, one [9.1%] from Australia, and seven [63.6%] from Asia). All studies were retrospective (1616 patients included). The mean duration was 12.71 ± 12.31 years. Five studies (45.5%) showed no effect of timing on the outcomes, two (18.2%) recommended both early and late operation, another two (18.2%) concluded that late operation is better, one (9.1%) found that early surgery is better, while one study (9.1%) stated that the timing of operation should be based on the category of the patient.

Table 2 depicts the details of the studied articles.

4. Discussion

In the present review, the first published article retrieved [6] concluded that completion thyroidectomy should be performed as early as possible (<7 days) to prevent any permanent damage to the recurrent laryngeal nerve; a study published in Germany assessed the papillary and follicular thyroid cancer for disease-free and long-term survival, whereby a completion thyroidectomy was conducted within an interval ranging

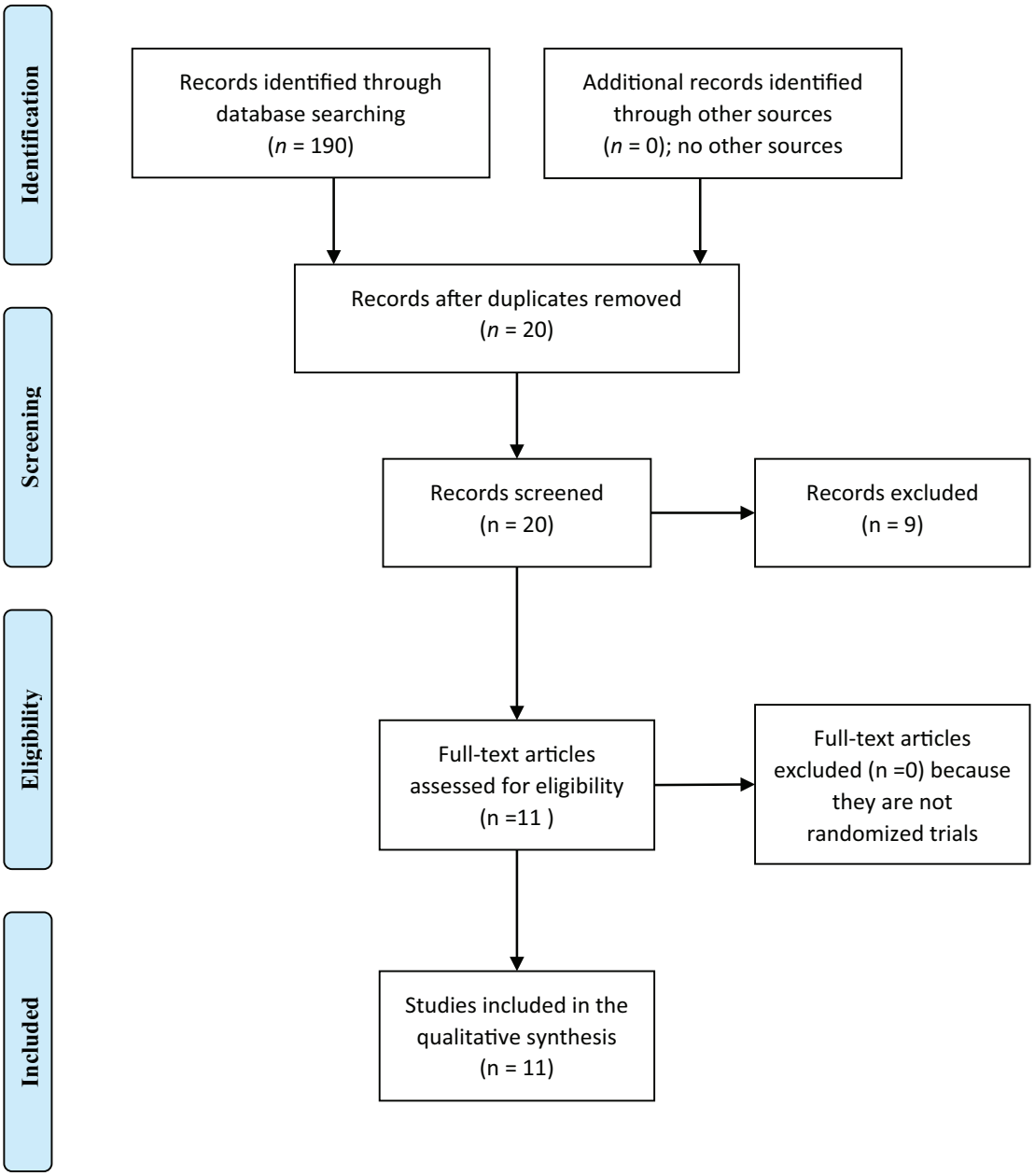

Figure 1: Flow diagram of the different phases of the systematic review (PRISMA flowchart).

from three days to four months [7]. The authors suggest that completion thyroidectomy is better performed within seven days or after three months. Tan *et al.* [8] assessed 63 patients (operation time within ten days and after three months) and concluded that the timing of thyroidectomy has no impact on complications; similar findings were observed by Makay and colleagues [9] who observed 150 patients (the operation time ranged from five days to six months, followed for recurrent laryngeal nerve injury, transient, and permanent hypothyroidism). Balock *et al.*, Kepenekçi *et al.*, and Erbil *et al.* [10–12] found that the best time is after three months. Cho *et al.* [13] studied 522 patients with papillary thyroid carcinoma in South Korea, the American Thyroid Association [14], and

Table 1: The quality of the selected studies determined using the Newcastle–Ottawa scale.

Author	Selection	Compatibility and Outcome	Total Score
Rau *et al.*	4	2	6
Walgenbach *et al.*	4	3	7
Tan *et al.*	4	3	7
Makay *et al.*	4	3	7
Balock *et al.*	4	1	5
Erbil *et al.*	4	2	6
Kepenekçi *et al.*	4	2	6
Cho *et al.*	4	3	7
Glockzin *et al.*	4	3	7
Kısaoğlu *et al.*	4	2	6
Salem *et al.*	4	3	7

the National Comprehensive Cancer Network (NCCN) [15] were followed for the extent of surgery the authors compared early surgery (within three months) and follow-up groups without immediate surgery, the patients were observed for central and lateral recurrences. Based on the observation that no differences were found between groups, the authors concluded that the timing of completion thyroidectomy should be based on the patient's risk category. Cho and colleagues' [13] study was limited due to the short period of follow-up (3.5 years) that may not be enough for metastasis evaluation, and also the fact that four surgeons conducted the operations should be considered, since it is well-known that the access to an experienced surgeons is among the predictive factors of the outcome [16]. Moreover, while Glockzin *et al.* [17] concluded that the best time is within three days or after three months, Kısaoğlu *et al.* [1] found no effect of timing on morbidity. On the contrary, a relatively recent study conducted in Egypt [18] concluded that the best timing is at least six months after the first surgery.

5. Conclusion

The time of completion thyroidectomy is better within seven days or after three months. However, some studies found no effect of timing on the outcome.

Declaration Section

Table 2: The timing of completion thyroidectomy and complications.

Author	Year	Country	Type	Patients	Study Period	Result
Rau *et al.*	1998	Germany	Retrospective	60	10 years	Time > 7 days is associated with permanent damage to the recurrent laryngeal nerve
Walgenbach *et al.*	2002	Germany	Retrospective	81	16.25 years	Within seven days or after three months
Tan *et al.*	2002	Australia	Retrospective	63	45 years	Timing has no impact on complications
Makay *et al.*	2006	Turkey	Retrospective	150	6.5 years	Timing has no impact on complications
Balock *et al.*	2007	Pakistan	prospective	141	6.75 years	Timing does not influence the complications rate
Erbil *et al.*	2008	Turkey	Retrospective	60	–	90 days after
Kepenekçi *et al.*	2009	Turkey	Retrospective	241	5.67 years	Can be undertaken at any time
Cho *et al.*	2012	South Korea	Retrospective	522	4 years	Should be based on the patient's risk category
Glockzin *et al.*	2012	Germany	Retrospective	128	17 years	Within three days or after three months
Kısaoğlu *et al.*	2014	Turkey	Retrospective	52	8 years	Timing of surgery does not affect morbidity
Salem *et al.*	2017	Egypt	Retrospective	118	8	The operation should be performed at least six months after the primary surgery

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Ethical Considerations

The current study has been approved by the ethical committee of the Medical College, University of Tabuk, Saudi Arabia.

Competing Interests

The author declares that there are no conflicts of interest

Availability of Data and Material

The data included in this manuscript are available upon request

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