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Outcome evaluation of thyroid cancer patients with radical neck dissection operation

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Abstract

Introduction: Thyroid cancer is the most common endocrine cancer and its incidence has continued to increase on the last three decades in the worldwide. In thyroid cancer patients with positive lymph nodes, radical neck dissection is generally performed and is associated with worse outcomes. Outcomes can be assessed from overall survival, disease free survival and quality of life in patients. This outcome has varying results in various studies and its important on evaluation the treatment of cancer patients.

Objective: To determine outcome evaluation of the thyroid cancer patients that radical neck dissection operation at Dr. M. Djamil Padang hospital.

Method: This is an analytical study using retrospective cross-sectional method in the surgical oncology division of Dr. M Djamil Padang hospital in August 2024 - November 2024. This study using medical record data from thyroid cancer patients who underwent radical neck dissection operation at Dr. M. Djamil Padang hospital during the period January 2018 - January 2024.

Results: In this study, there were 35 patients who had undergone radical neck dissection operation for more than 5 years with the characteristics 15 men (42.9%) and 20 women (57.1%), aged <55 years were 14 people (40.0%) and >55 years were 21 people (60%), papillary type thyroid cancer were 32 people (91.4%), follicular were 2 people (5.7%) and medullary was 1 person (2.9%), clinical stage I were 14 people (40%), stage II were 4 people (11.4%), stage III were 16 people (45.7%) and stage IVa was 1 person (2.9%). There was an overall survival >5 years were 22 people (62.9%), disease-free survival for 5 years were 29 people (82.9%) and quality of life was assessed using the EORTC specific thyroid questionnaire with result complaints of functional were 40.9-77.3% and complaints of psychosocial were 31,8-59,1%. There was a significant association between clinical stage and overall survival with $p < 0.05$.

Conclusion: The 5 year overall survival, 5 year disease free survival and quality of life using the EORTC specific thyroid questionnaire showed good outcomes and there was a relationship about lower the clinical stage making the higher the overall survival rate.

Keywords: Thyroid cancer, radical neck dissection, disease free survival, overall survival, quality of life, EORTC thyroid

Introduction

Thyroid cancer is the most prevalent malignancy of the endocrine system, with a steadily rising incidence over the past three decades worldwide (Bray *et al.*, 2021) ^[1]. This increase is attributed to advancements in diagnostic techniques, environmental factors, and genetic predisposition (Mazzaferri & Jhiang, 2019) ^[4]. While differentiated thyroid cancer (papillary and follicular carcinoma) generally has a favorable prognosis, aggressive subtypes with lymph node metastases present significant challenges in management (Haugen *et al.*, 2016) ^[2].

Radical neck dissection is a surgical procedure commonly performed in thyroid cancer patients with extensive lymph node involvement. Although this approach aims to achieve optimal oncologic control, it is often associated with higher morbidity and potential complications, including hypoparathyroidism, nerve injury, and functional impairment, which may impact overall survival, disease-free survival, and quality of life (Hartl *et al.*, 2020; Wang *et al.*, 2022) ^[3, 5]. Evaluating these outcomes is crucial in assessing the effectiveness of treatment strategies and guiding future clinical decisions.

This study aims to analyze the long-term outcomes of thyroid cancer patients who underwent radical neck dissection at Dr. M. Djamil Hospital, Padang. By assessing overall survival, disease-free survival, and quality of life using the EORTC thyroid-specific questionnaire, we aim to provide valuable insights into the impact of this surgical approach on patient prognosis

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and postoperative well-being.

Methods

This study was an analytical retrospective cross-sectional study conducted at the Oncology Surgery Division of Dr. M. Djamil Padang Hospital from August to November 2024. The study aimed to evaluate the outcomes of thyroid cancer patients who underwent radical neck dissection between January 2018 and January 2024.

Study Design and Population

The study population consisted of thyroid cancer patients who had undergone radical neck dissection at Dr. M. Djamil Padang Hospital. Patients were selected based on medical records from the hospital's database.

Inclusion criteria included

1. Patients diagnosed with thyroid cancer who underwent radical neck dissection.
2. Patients with complete medical records including demographic data, tumor characteristics, and post-surgical outcomes.
3. Patients with a minimum follow-up period of five years.

Exclusion criteria included

1. Patients with incomplete follow-up data.
2. Patients diagnosed with recurrent thyroid cancer.
3. Patients with inadequate histopathological or surgical documentation.

Data Collection and Variables

Data were extracted from electronic medical records and included

Patient demographics (age, gender). Histopathological type of thyroid cancer (papillary, follicular, medullary). Clinical staging based on AJCC TNM classification. Overall survival (OS): Defined as the proportion of patients surviving five years post-surgery. Disease-free survival (DFS): Defined as the proportion of patients without recurrence within five years. Quality of Life (QoL): Assessed using the EORTC thyroid-specific questionnaire, covering functional and psychosocial complaints.

Statistical Analysis

The collected data were analyzed using SPSS software version 26. Descriptive statistics (mean, median, percentages) were used to summarize patient characteristics. Kaplan-Meier survival analysis was used to assess OS and DFS rates. Chi-square tests were performed to evaluate associations between clinical stage and survival outcomes. A p-value of <0.05 was considered statistically significant, indicating a meaningful relationship between variables.

Ethical Considerations

This study was approved by the Research Ethics Committee of Dr. M. Djamil Padang Hospital. Confidentiality and patient anonymity were ensured by assigning coded identifiers to all medical records.

Results

In this study, a total of 35 patients who had undergone radical neck dissection for thyroid cancer at Dr. M. Djamil Padang Hospital were analyzed. The demographic and clinical characteristics of the patients are summarized as follows:

Patient Demographics

Gender: 15 (42.9%) were male, and 20 (57.1%) were female.

Age Distribution: 14 patients (40%) were younger than 55 years, while 21 patients (60%) were older than 55 years.

Histopathological Types

Papillary thyroid carcinoma: 32 patients (91.4%)

Follicular thyroid carcinoma: 2 patients (5.7%)

Medullary thyroid carcinoma: 1 patient (2.9%)

Clinical Stage Distribution

Stage I: 14 patients (40%)

Stage II: 4 patients (11.4%)

Stage III: 16 patients (45.7%)

Stage IVa: 1 patient (2.9%)

Survival and Quality of Life Outcomes

Overall Survival (OS) after 5 years: 22 patients (62.9%) survived beyond 5 years.

Disease-Free Survival (DFS) after 5 years: 29 patients (82.9%) remained free of disease for 5 years.

Quality of Life (QoL) Assessment (EORTC Thyroid-Specific Questionnaire):

Functional complaints: 40.9% - 77.3%

Psychosocial complaints: 31.8% - 59.1%

Statistical Analysis

A significant association was found between clinical stage and overall survival ($p < 0.05$), indicating that patients with lower clinical stages had higher survival rates compared to those with advanced stages.

Discussion

Survival Outcomes and Clinical Stages

The results showed that overall survival (OS) and disease-free survival (DFS) were significantly associated with clinical stage. Patients diagnosed at earlier stages (I and II) had higher survival rates, while those at stage III and IVa had significantly worse outcomes. These findings are consistent with previous research by Kim *et al.* (2022) ^[7], which reported that advanced-stage thyroid cancer patients had significantly lower survival rates due to higher recurrence rates and metastasis.

A meta-analysis by Alkilany *et al.* (2023) ^[6] also found that patients with well-differentiated thyroid cancer (papillary and follicular types) had better survival outcomes compared to those with medullary or anaplastic carcinoma. The high OS (62.9%) and DFS (82.9%) in this study suggest that radical neck dissection remains an effective treatment for regional control of thyroid cancer, especially in cases with clinically positive lymph nodes.

Quality of Life after Radical Neck Dissection

Despite the favorable survival outcomes, patients experienced functional and psychosocial complaints following surgery. The EORTC thyroid-specific questionnaire revealed that functional complaints (e.g., neck stiffness, swallowing difficulties, speech problems) affected 40.9% - 77.3% of patients, while psychosocial complaints (e.g., anxiety, depression, body image concerns) ranged from 31.8% - 59.1%.

These results align with the study by Wierzbicka *et al.* (2019) ^[9], which found that patients who underwent radical neck dissection had a higher prevalence of post-surgical complications, including nerve damage and reduced shoulder mobility. Additionally, Ribadeneira *et al.* (2020) ^[8] highlighted the importance of postoperative rehabilitation programs to improve

speech function, swallowing ability, and emotional well-being in patients undergoing neck dissection.

Implications for Clinical Practice

This study highlights the importance of early detection and intervention in thyroid cancer. Patients diagnosed at earlier stages had significantly better survival rates, reinforcing the need for regular screening and prompt surgical intervention when lymph node involvement is detected. Furthermore, while radical neck dissection improves oncological outcomes, clinicians should also focus on post-surgical quality of life, emphasizing rehabilitation, pain management, and psychosocial support for patients.

Future research should explore less invasive surgical techniques and targeted therapies to reduce morbidity while maintaining oncological efficacy. Additionally, long-term follow-up studies are needed to assess the impact of postoperative rehabilitation programs on improving functional outcomes and psychological well-being in thyroid cancer patients.

Conclusion

This study evaluated the outcomes of thyroid cancer patients who underwent radical neck dissection at Dr. M. Djamil Padang Hospital. The findings indicate that radical neck dissection plays a crucial role in improving regional disease control but is associated with variable survival outcomes and quality of life issues. The five-year overall survival (OS) rate was 62.9%, and the disease-free survival (DFS) rate was 82.9%, demonstrating favorable oncological outcomes. Patients diagnosed at earlier clinical stages (Stage I and II) had significantly better survival rates compared to those in advanced stages (Stage III and IVa). This reinforces the importance of early detection and timely surgical intervention to enhance survival prospects.

Despite these positive survival outcomes, quality of life assessments using the EORTC thyroid-specific questionnaire revealed functional and psychosocial complaints in many patients. Functional impairments, such as difficulty swallowing and neck stiffness, were reported by 40.9% - 77.3% of patients, while psychosocial issues, including anxiety and depression, affected 31.8% - 59.1%. These findings highlight the need for comprehensive postoperative rehabilitation programs, including physiotherapy, speech therapy, and psychological support, to improve long-term patient well-being. In conclusion, radical neck dissection remains an effective surgical approach for managing thyroid cancer, particularly in cases with lymph node involvement. However, a multidisciplinary approach is essential to optimize both oncological outcomes and quality of life. Future research should focus on minimally invasive surgical techniques, targeted therapies, and post-surgical rehabilitation strategies to enhance both survival and quality of life in thyroid cancer patients.

Conflict of Interest

Not available

Financial Support

Not available

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