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Factors Related to Patient Satisfaction Level of Thyroid Tumor on Post-Operative Thyroidectomy Scar Based on Patient Scar Assessment Scale (PSAS) in General Hospital Dr. M. Djamil Padang

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ABSTRACT

Introduction : Dr. M. Djamil Padang General Hospital (RSUP) still applies conventional methods as thyroidectomy treatment. Satisfaction and comfort to the scar is one of the issues because conventional thyroidectomy surgery scars are located in the neck area that will affect the confidence of patients, especially women. Method: This research was a quantitative research using cross sectional study design. The research was conducted at The Oncology Surgery Polyclinic of RSUP Dr.M. Djamil Padang with a sample of 50 respondents. Result: More than half of thyroid tumor patients found were women (56%), most patients had total thyroidectomy surgery (70%) with malignan tumor type (72%), and the most tumor size in the T4 group (52%). The average age of patients during surgery was 54.26 years. The average patient satisfaction score for post-thyroidectomy scars was 14.72 with a total score of 16, the lowest score was 6 and the highest score was 22. Significant relationships were found in variable tumor size (p=0.000), type of surgery (p=0.005), tumor type (p=0.004) and gender (p=0.028), while there was no statistically significant relationship between age and patient satisfaction with postthyroidectomy scars (p=0,176). Conclusion: There were significant relationships between gender, type of surgery, type of tumor, tumor size to patient satisfaction with post-thyroidectomy scars, while age has no signifacnt relationship to patient satisfaction with post-thyroidectomy scars. A small number of PSAS score showed that the average patient was satisfied with post-thyroidectomy scar.

1. Introduction

The thyroid gland is the largest endocrine gland in the human body. Thyroid nodules are abnormal growths of thyroid cells that form a lump in the thyroid gland. This abnormal growth causes an increase in the size of the thyroid which can later become a very large thyroid nodule. Thyroid nodules can be benign and malignant.¹ Thyroid nodules that are benign take longer to become large nodules than thyroid nodules which are malignant.²

Data from The American Cancer Society, about 56.870 new cases of thyroid tumors diagnosed in 2017, 42.470 cases of which occurred in women, 14.400 cases occurred in men.³ The incidence of thyroid carcinoma, namely age <20 years was 1.8%, age range 20-34 years by 15.1%, age 35-44 years by 19.6%, age 75-84 years down to 1.4% and the peak at the age of 45-54 years is 24.2%. The highest mortality rate lies at the age of 75-84 years, namely 28.9%.⁴ In Indonesia, from the registration of the Indonesian Pathology Specialist Association, thyroid malignancies rank 9th out of the ten most common malignancies (4.43%).⁵

The incidence of thyroid tumors increases with age and the incidence rate is high in women with risk factors for iodine deficiency and after radiation exposure. Exposure to ionizing radiation is a trigger factor for the development of thyroid nodules and also a risk factor for turning thyroid nodules into malignancy. In the atomic bombings of Hiroshima and Nagasaki, thyroid nodules were found in 12.3% in men and 24.8% in women.⁶

One of the modalities in the management of thyroid nodules is surgical thyroidectomy. The conventional method of thyroidectomy is to perform a collar or midcervical incision. The incisions required for thyroidectomy using conventional methods range from 8-10 cm. In a study conducted by Laurent Brunaud et al (2003) the incisions required for lobectomy ranged from 6-8 cm and total thyroidectomy ranged from 7-12cm. So that this method can leave a large scar (scar) in the patient.^{1,7,14}

The extensive scars caused by conventional thyroidectomy have led to the development of the minimally invasive thyroid surgery method introduced by Huscher CS using the endoscopic thyroidectomy technique through the anterior chest approach and transoral endoscopic with an incision of approximately 15 mm at several points and leaving a scar (scar) which is small. However, the minimally invasive method is of limited use because it can only be performed on a thyroid with a nodule diameter <3 cm and sometimes causes severe postoperative pain complications compared to conventional methods and hospitals (hospitals) must have complete equipment facilities to support the minimally invasive method. ^{8,9,18}

Based on the results of research by Felix et al. (2019), the results of patient satisfaction levels with conventional thyroidectomy scars where 91.7% of respondents stated a high level of satisfaction with surgical scars.¹⁰ Based on the research conducted by Seong Hwan Bae et al (2014) on The most frequently used in assessing scar outcome is the Patient Scar Assessment Scale, which is the most widely used compared to other scar scoring scales such as the Vancouver Scar Scale (VSS), Visual Analog Scale (VAS), Manchester Scar Scale (MSS). Stony Brook Scar

Evaluation Scale (SBSES).12 Patient Scar Assessment Scale (PSAS) which has advantages where the assessment item is the patient's expression or perception of the scar and the assessment indicators are based on color, thickness, flexibility, surface, itching and pain to the scar assessed by comparing it with the area around the be scar making it easier to provide an assessment.11 The Central General Hospital (RSUP) Dr. M. Djamil Padang still applies conventional methods of thyroidectomy management. In general, patients who undergo conventional thyroidectomy surgery at RSUP Dr.M. Djamil Padang is a woman, as it is known that the satisfaction and comfort of scars will be a concern for women, especially when conventional thyroidectomy is located on the neck area which will affect self-confidence. In Indonesia, there is no research that focuses on the satisfaction of thyroid tumor patients with conventional thyroidectomy scars, so it is necessary to conduct an assessment of the level of patient satisfaction with surgical scars which refers to the Patient Scar Assessment Scale (PSAS) indicator. Research on the level of satisfaction with patients undergoing thyroidectomy using conventional surgery methods can be used as one of the considerations in deciding which surgical technique to use in patients with thyroid tumors who will undergo thyroidectomy. 10,11,12

2. Methods

This research is a descriptive analytic study with a cross-sectional study design. This study is to see and identify factors related to patient satisfaction levels after thyroid tumor surgery based on the PSAS Scale standard. This research was conducted at the Surgical Oncology Polyclinic Dr. M Djamil Padang, from March 2020 to December 2020 with a total sample of 50 people.

Inclusion criteria

1. Patients who undergo thyroid tumor surgery

and complete medical record data.

- 2. The patient is over 17 years of age.
- 3. Willing to be a respondent by agreeing to an informed consent.

Exclusion criteria

- 1. Patients who require additional surgical procedures requiring expansion of the incision except for a linear incision such as a sternotomy.
- 2. Complications of surgery that cause the incision wound to be reopened.
- 3. Postoperative infected wounds.
- 4. Patients with a history of hypertension.
- 5. The patient has a history of surgery with unfavorable scars or scars such as hypertrophy of the scars and keloids

3. Results

Research overview

The study was conducted to determine the relationship between the type of thyroid surgery, tumor type, tumor size, gender, and age with the level of patient satisfaction with post thyroidectomy scar surgery which was assessed based on the PSAS score. The research was conducted at Dr. M. Djamil Padang. The number of respondents was 50 people.

Characteristics of patients

Based on table 1, it was found that the number of thyroid tumor patients was more in women (56%), most of the patients had total thyroidectomy surgery (70%) with malignant tumor types (72%), and the largest tumor size was in the T4 group (52%). Most of the patients at surgery were over 60 years old, the youngest was 19 years old and the oldest was 86 years old.

Based on table 2, it was found that the results of the patient's satisfaction score on the postthyroid surgery scar were an average of 14.72 with the highest total score of 16, the lowest score of 6 and the highest score of 22.

Based on table 3, the results show that the assessment of the patient's scars after thyroid surgery is on a scale range 1 - 4 from a total score of 10 for the statement of feeling of pain in the scar, the scar itching, the color of the scar skin, the stiffness of the scar, the thickness of the scar and form scars. The mean PSAS score of the patient on the 6 statements is below 3. This small PSAS score assumes that post-thyroid surgery patients feel satisfaction with the scar based on the 6 statements contained in the PSAS questionnaire.

Relationship between tumor type and PSAS score

Based on the results of table 4, the results show that the average PSAS score in the benign group was 12.14, while the average PSAS score in the malignant group was 15.72. Based on the results of the T-Test statistical test, the p-value was 0.004, meaning that there was a significant relationship between tumor type and the PSAS score. Malignant tumors have a higher mean PSAS score compared to benign tumor types, this means that the level of satisfaction with scars in benign tumor types is better than that of malignant tumor types.

Relationship between type of operation and PSAS score

The mean PSAS score in the Left Hemithyroidectomy group was 13.18 with the PSAS score in the range 8 - 18, the mean PSAS score in the right hemithyroidectomy group was 9.75 with the PSAS score in the range 6 - 18, while the mean score was 9.75. The mean PSAS score for total thyroidectomy was 15.77 with the PSAS score in the range 6-22.

Based on the results of the One Way Anova statistical test, the p-value was 0.005, meaning that there was a significant relationship in the type of surgery performed with the PSAS score of post-thyroidectomy surgery patients. Patients with left and right hemithyroidectomy had better PSAS scores compared to the total thyroidectomy group. The PSAS score ranges obtained by patients with left and right thyroidectomy were almost the same, whereas patients with total thyroidectomy had the highest PSAS scores.

Relationship between tumor type and PSAS score

The mean PSAS score in the benign group was 12.14, while the mean PSAS score in the malignant group was 15.72. Based on the results of the T-Test statistical test, the p-value was 0.004, meaning that there was a significant relationship between tumor type and the PSAS score. Malignant tumors have a higher mean PSAS score compared to benign tumor types, this means that the level of satisfaction with scars in benign tumor types.

Relationship between gender and PSAS score

The mean PSAS score in the women was 13.61, while the mean PSAS score in the boys group was 16.14. Based on the results of the T-Test statistical test, the p-value was 0.028, meaning that there was a significant relationship between gender and the PSAS score. The mean PSAS score in men (16.14) was higher than the mean PSAS score in women (13.61). This means that the level of satisfaction with surgical scars in women is better than that of men.

Relationship between age and PSAS score

In this study, the majority of patients were elderly people over 60 years old as many as 26 people, 22 patients in the age range 25-60 years, and only 2 patients in the teenage age range. Based on statistical tests using the One Way Anova test, the p value is 0.176, meaning that there is no significant relationship between age and PSAS score in respondents.

No	Variable	Category (n = 50)	Frequency (f)	Percentage (%)
1	Gender	Male	22	44.0
		Female	28	56.0
		Total	50	100.0
2	Types of Thyroid Surgery	Total Thyroidectomy	35	70.0
		Right Hemithyroidectomy	4	8.0
		Left Hemithyroidectomy	11	22.0
		Total	50	100
3	Type of tumor	Malignant	36	72.0
		Benign	14	28.0
		Total	50	100.0
4	Size of tumor	T1	4	8.0
		T2	12	24.0
		ТЗ	8	16.0
		T4	26	52.0
		Total	50	100.0
5	Age	Youth (12 - 24 years)	2	4.0
		Adult (25 - 60 years)	22	44.0
		Elderly (> 60 years)	26	52.0
		Total	50	100.0

Table 1.Categorical scale variable frequency distribution

Table 2.	Frequency	distribution	of numeri	c variables
	1 2			

No	Variable	-	Mogn	Modian	Modus	Sd.	Ra	nge
110	Vallable		meun	meutun	mouus	deviation	Min	Max
1	Skor PSAS	50	14.72	15.50	16	4.071	6	22

Table 3.Frequency distribution of patient psas questionnaire scores on post-thyroidectomy scars

No	Patient scar asessement scale	n	Mean	Med	Mod	Min - Max	Std. Deviation
1.	The area of the surgery scar feels painful or sore after 6 months after surgery.	50	2.26	2	1	1 - 4	1.103
2.	The scar itching after 6 months after surgery.	50	2.70	3	3	1 - 4	0.814
3.	The color of the scar skin was different from other skin areas after 6 months after surgery.	50	2.46	3	3	1 - 4	0.973
4.	The surgical scar feels stiff and hard after 6 months postoperatively.	50	2.36	2	2	1 - 4	0.942
5.	The thickness of the surgical scar felt different after 6 months postoperatively.	50	2.52	3	3	1 - 4	1.015
6.	The surgical scar is unusual (odd) after 6 months postoperatively.	50	2.42	2	1	1 - 5	1.214

Table 4. Correlation between tumor size and patient satisfaction in post-thyroidectomy scar based on

PSAS score							
Type of ourgony	n		PSAS Score		D voluo		
Type of surgery	11	Mean	Std. deviation	Min - Max	P value 0.000		
T1	4	7.25	1.500	6 – 9	0.000		
T2	12	11.67	2.229	6 – 14	0.000		
ТЗ	8	13.75	2.915	8 – 16			
Τ4	26	17.58	2.335	12 – 22			

Table 5. Relationship Type of surgery with patient satisfaction levels in post-thyroidectomy scar based on

PSAS score

Tupo of ourgory	2		PSAS Score		P voluo
Type of surgery	Mean Sto	Std. deviation	Min - Max	r value	
Left Hemi Thyroidectomy	11	13.18	3.545	8 - 18	0.005
Right Hemi Thyroidectomy	4	9.75	5.679	6 – 18	0.005
Total Thyroidectomy	35	15.77	3.540	6 - 22	

Table 6. Relationship between tumor types and patient satisfaction on post-thyroidectomy scar based on PSAS score

Tumor trino		PSA	AS Score	Duchuc
Tumor type	11	Mean	Std. deviation	P value
Benign	14	12.14	4.418	0.004
Malignant	36	15.72	3.502	0.004

Table 7. The relationship between gender and patient satisfaction levels on post-thyroidectomy scars based on the PSAS score

Gender	5	PSA	PSAS Score		
	11	Mean	Std. deviation	P value	
Female	28	13.61	3.975	0.008	
Male	22	16.14	3.821	0.028	

Table 8. Relationship between age and patient satisfaction levels on post-thyroidectomy scar based on PSAS score

A ~~	N	PSA	AS Score	P value
Age	IN	Mean	Std. deviation	
Teenager (12 – 24 y.o)	2	10.50	3.536	
Adult (25 – 60 y.o)	22	14.18	4.113	0.176
elderly people (> 60 y.o)	26	15.50	4.071	

4. Discussion

Statistical analysis showed that most of the patients who became respondents were thyroid surgery patients with total thyroidectomy surgery with malignant tumor type and the largest size was T4. The results of statistical analysis showed that there was a relationship between the type of surgery and the level of patient satisfaction with the postoperative scar thyroid tumor based on the PSAS standard (p = 0.005 or p < 0.05). Judging from the total PSAS score in thyroid patients who were respondents in this study, it was found that hemythiroidectomy the left. and right hemythyroidectomy had a good level of satisfaction with the wound healing compared to patients who had total thyroidectomy surgery. However, in the three groups for this type of surgery, the patient's PSAS score tended to be in a low score, namely in the range of 6-22 from a maximum score of 60. This indicates good satisfaction with the healing of thyroid surgery scars.

Patients who underwent a thyroidectomy had normal thyroid hormone levels compared to those who had a total thyroidectomy. Patients who underwent total thyroidectomy had lower thyroid hormone levels or postoperative hypothyroidism compared with patients who had a thyroidectomy. This condition affects the wound healing process where thyroid hormone has an effect on epidermal proliferation through keratin gene expression, namely cytokeratin 6a expression, Cytokeratin 16 expression, Cytokeratin 17 expression, which work in the proliferation phase to produce optimal wound healing processes.²¹

Thyroid hormone that is active in the form of T3 affects the deiodinase 3 enzyme which works actively to affect fibroblast cells which are important in collagen synthesis which will replace fibrin as the main matrix constituent in damaged addition. differences in patient skin.32 In satisfaction with total thyroidectomy and hemithyroidectomy are one of them caused by different incision area in these two procedures. Based on research conducted by Laurent Brunaud et al. (2003), the incisions required for lobectomy range from 6-8 cm and total thyroidectomy measures range from 7-12 cm. This method leaves extensive scars on the patient. However, the univariate results show that the mean PSAS score of the patient is at a value of 14.72 from the highest total score of 60.It can be concluded that patients with hemithyroidectomy and total thyroidectomy surgery have a good level of satisfaction in healing surgical scars.

Significant associations were also found for the variable tumor type and PSAS score. Based on the results of statistical tests, the value of p = 0.004or p <0.05 was obtained. The mean value obtained in patients with malignant tumor types was higher than in patients with benign tumor types. It can be concluded that patients with benign tumor types have better satisfaction with the surgical scar compared to patients with malignant tumor types. The PSAS scores obtained in patients with benign and malignant tumors were in the range of mean values of 12.14 - 15.72. When compared with the maximum total PSAS score of 60, the PSAS score in these two patients is still low, which means that the patient has a good level of satisfaction with both benign and malignant surgical scars. The results of this study are in line with research conducted by Felix, et al. In 2019 which stated that the level of patient satisfaction with thyroid surgery scars was very good in patients with benign and malignant tumors who had conventional thyroidectomy.¹⁰

The results of statistical analysis showed that there was a relationship between tumor size and the level of patient satisfaction with the postoperative scar thyroid tumor based on the PSAS standard (p = 0.000 or p < 0.05). This is in line with a study conducted by Michael Ziegle et al in 2013 which stated that tumor size is a strong predictor of the risk of postoperative wound complications. The association demonstrated by several studies suggests that tumors larger than 5 cm, 8 cm and even 10 cm in diameter have all been shown to be associated with a higher risk of wound complications.³²

Postoperative wound complications after thyroidectomy remain an important source of morbidity for patients. As many as 16-56% of surgical cases may include complications such as seroma, hematoma, wound necrosis, wound dehiscence, cellulitis, and abscess formation. There are several risk factors that play a role in this complication such as the location of the disease, tumor size, and proximity to the skin. Most of the studies evaluating size as a risk factor for complications considered the maximal dimensions of the primary tumor. Although the maximum measurement in one dimension gives an idea of tumor size, overall size, or volume.33,34,35,36,37

There was а statistically significant relationship between tumor volume and the rate of wound complications where an increase in tumor volume predicted a greater risk of postoperative complications. wound These findings first confirm the importance of tumor size as a risk factor for postoperative wound complications. What's more, this study also showed that tumor volume versus tumor diameter or cross-sectional area was a stronger predictor of the risk of postoperative wound complications. A possible explanation for the impact of tumor size on wound complication rates is that larger tumors produce larger dead space in the soft tissue after resection, leading to seroma, hematoma, and infection.32

In the univariate analysis, it was found that the mean PSAS score of patients with tumor sizes T1, T2, T3, and T4 was in the range 6 - 22, where the lowest PSAS score was given by patients with tumor size T1 and the highest PSAS score was given by patients with tumor size T1. T4 tumor size. This proves that the larger the tumor size, the higher the PSAS score given by the patient, which means the lower the patient's satisfaction with the healing of the surgical scar. However, the PSAS score ranges in the patient group with tumor sizes T1, T2, T3. and T4 in this study is still relatively small compared to the maximum PSAS score of 60.

The relationship between Gender and PSAS showed a statistically significant relationship between the sex of thyroid tumor patients and the level of patient satisfaction with the postoperative scarring of thyroid tumor based on the PSAS standard (p = 0.028 or p < 0.05) where the mean PSAS score in men was Men were higher than the mean PSAS score in women, meaning that the level of satisfaction with injuries was better for women than men.

The results of this study are consistent with the 2007 study by Hardman and Ashcroft which stated that estrogen influences wound healing by regulating various genes related to regeneration, matrix production, protease inhibition, epidermal function, and genes primarily associated with inflammation.38 Sex hormones play a role in agerelated wound healing deficits. Compared with elderly women, elderly men have been shown to experience delayed wound healing. The female hormones estrogen (estrone and 17β -estradiol), male androgens (testosterone and 5αdihydrotestosterone, DHT), and the steroid precursor dehydroepiandrosterone (DHEA) have a significant effect on the wound healing process.³⁹

The results of statistical analysis showed there was no influence between age at surgery and PSAS (p = 0.176 or p > 0.05). Based on univariate analysis, the mean age of respondents in this study was 54.26 years with the youngest age range being 19 years and the oldest being 86 years old. Based on this, it can be assumed that the respondents in this study were at the old age as many as 26 people. There were 22 patients in the age range 25-60 years, and there were only 2 patients in the adolescent age range.

Several clinical studies at the cellular and molecular levels have examined age-related changes and delays in wound healing. Overall, there were overall differences in wound healing between young and elderly individuals. Reviews of age-related changes in healing capacity indicate that each phase of healing undergoes distinctive age-related changes, including increased platelet aggregation, increased secretion of inflammatory mediators, delayed infiltration of macrophages and lymphocytes, impaired macrophage function, decreased growth factor secretion, delayed reepithelialization, delayed angiogenesis and collagen deposition, reduced collagen turnover and remodeling, and decreased wound strength.⁴¹

5. Conflict of Interest : -

6. Funding : -

7. Author Contributions

Defri Heryadi was responsible for data collection, research administration and writing the original draft. Daan Khambri and Rony Rustam were responsible for the statistical analysis and writing of the original draft. All authors have reviewed the latest version of the manuscript.

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