

Long-Term Scar Satisfaction of Thyroidectomy Patients with Classical Mid-Cervical Incision

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ABSTRACT

Objective: Thyroidectomy is a commonly performed surgical procedure for benign or malignant thyroid pathologies. Patients generally mention about their reservations about the shape of skin incision. In order to minimize the scar deformity, novel surgical procedures were described in the literature. Despite the cosmetic advantages of endoscopic techniques, conventional thyroidectomy is still valid. We aimed to investigate the relationship between the scar length, type of surgery, obesity, scar appearance, and patient satisfaction for thyroidectomy patients with classical mid-cervical incision.

Methods: A total of 98 patients were included in the study. Patient and Observer Scar Assessment Scale was used for measuring the satisfaction.

Results: The mean overall satisfaction score was 1.77 (1: normal; 10: worst) and the vast majority of the patients (92/98, 93.9%) were satisfied with their surgical scars. Significantly higher Observer Scar Assessment Scale scores were observed in patients who have secondary (completion of contralateral lobectomy) surgery, malignant pathologies, and radioactive iodine treatment ($P < .001$; $P = .009$; $P = .002$, respectively). There were no significantly different Observer Scar Assessment Scale scores in patients according to sex, body mass index, and incision length.

Conclusion: The classical mid-cervical incision has positive long-term satisfactory results. Patients requiring early secondary (completion) thyroidectomy should be informed about the possible unsatisfactory results, and the surgeon should pay more attention and act as carefully as possible for skin closure.

Keywords: Thyroidectomy, thyroid, scar, incision, satisfaction

Introduction

Thyroidectomy is a commonly performed surgical procedure for benign or malignant thyroid pathologies mostly in young women. In addition to benign pathologies, malignant pathologies also have a very long life expectancy, so patients live for many years with their scars, and scar-related quality of life is gaining importance by time.

Cosmesis is a priority for significant group of patients, and during the preoperative visit, many patients mention about their reservations about the shape of skin incision and risk of cosmetic deformity. In order to minimize or eliminate the scar deformity, novel endoscopic or robotic surgical procedures such as mini-incision video-assisted thyroidectomy, robotic transaxillary thyroidectomy, or robotic facelift thyroidectomy were described in the literature.¹⁻⁵ As technology advances, introduction of newer techniques and technologies in the field of surgery is accelerated. However, classical cervical

thyroidectomy is accepted as a gold standard technique with low morbidity and high level of disease control results.⁶ Besides the cosmetic advantage, these novel procedures have some disadvantages of additional expensive endoscopic instrumentation, cost, longer operative time, longer hospital stay, and newer complications such as brachial plexus injury. On the other hand, these novel techniques have important limitations according to nodule and gland size. These are not suitable for all thyroid pathologies; hereby, classical mid-cervical incision thyroidectomy is still valid and prevailing.

In the literature, Kocher's traditional 8-10 cm transverse incision is accepted as a standard incision for thyroid surgeries.⁷ In today's perspective, generally 4-6 cm length is enough for standard operation and the surgeon should keep in mind that the incision should be as small as possible and as large as necessary. Also, care should be taken in terms of symmetry. Modifications on the incision can be done when patients require extended exposure such as neck dissection or other

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additional procedures. On the other hand, major reductions in incision length for better cosmesis may increase the risk of complications.⁸ A surgeon should not forget that the control of the disease is more than the cosmetic appearance.

The purpose of this study was to evaluate the long-term scar appearance and satisfaction of the thyroidectomy patients with classical mid-cervical incision. Also, we aimed to investigate the relationship between scar length, type of surgery, obesity, and patient satisfaction.

Methods

Patient Sample

Following Haseki Research and Education Hospital (HREH) Ethical committee approval (November 24, 2021, 98-2021), patients who underwent total or hemithyroidectomy at the HREH by Otolaryngology and Head and Neck Surgery clinic with at least 1 year follow-up were included in the study. Retrospective review of the hospital and operative records in time period between 2015 and 2020 years was done and patients who were under 18 years old, <1 year postoperative follow-up, and additional procedures required larger incision such as neck dissection were excluded from the study. A total of 182 patients who met the criteria were called for control visit. A total of 98 patients were contacted and accepted to be included in the study. All patients were informed by verbal and written comprehensive consent forms. Patients' demographic properties (age, sex, education level, body mass index [BMI]), comorbidities (hypertension, diabetes, depression, etc.), scar length, final pathology, type of surgery, and the necessity for radioactive iodine (RAI) treatment were recorded.

Surgery

A standard transverse 4-6 cm mid-cervical skin incision was made for all patients usually 1 cm below the cricoid cartilage. Care is taken to place the incision in one of the skin creases of the neck. The subplatysmal superior flap is elevated to just above the notch of the thyroid cartilage. The subplatysmal inferior flap was dissected inferiorly to the level of the sternal notch. Retractors were used to provide and maintain exposure. First, superior pole of the thyroid lobe is ligated and disconnected. Second, recurrent laryngeal nerves (RLN) and parathyroid glands were carefully dissected. Finally, inferior lobe is dissected and inferior thyroid vessels were ligated. Same procedures were applied for the opposite lobe, if planned. During closure, strap muscles and subcutaneous tissue was

approximated with 4-0 absorbable Vicryl sutures and skin was closed with 4-0 non-absorbable polypropylene sutures in a subcuticular continuous fashion. Single passive drain was used in all patients and placed through the incision line.

Satisfaction Evaluation

Patient and Observer Scar Assessment Scale (POSAS) was used for measuring the satisfaction in our study.^{9,10} The patients were called at least 1 year after the surgery and control examinations were done. Scar assessments, satisfaction levels were evaluated with POSAS and this scale includes both observer and patient assessment. Observer assessment was performed by a single physician who was not involved in any of the surgeries (Y.B.) Observer scar assessment scale includes 5 items graded on a 10-point scale (1: normal 10: worst) The Patient Scar Assessment Scale (PSAS) consists of 6 items and is graded by the patient herself on a 10-point scale (1: normal 10: worst). After scoring the items, the observer and the patients rated the overall scar appearance on a visual analog scale on a 10-point scale (1: normal 10: worst) (Figure 1). Correlation between PSAS and OSAS scores was statistically evaluated and analyzed. The effect of some factors (scar length, obesity, types of surgery, etc.) on patient satisfaction and scar appearance was investigated.

Statistical Analysis

The Statistical Package for the Social Sciences (version 15.0; Chicago, Ill, USA) was used for all data analysis. Descriptive findings for categorical variables were reported as number and percentage; nominal variables were reported as mean, standard deviation, minimum, maximum, and median. When the nominal variables did not achieve normal distribution, independent group comparison was performed with Mann-Whitney *U* test for 2 groups and with Kruskal-Wallis test for more than 2 groups. Dependent group analysis was performed with Wilcoxon test. Spearman correlation analysis was used for relations between nominal variables when parametric test condition was not achieved. Relation formula is investigated with linear regression analysis. A *P* value of less than .05 was considered statistically significant.

Results

Of the 98 patients included in our study, 18 (18.4%) were male and 80 (81.6%) were female. The male to female ratio was approximately 1:4. Ages of the patients at the time of surgery were ranging from 19 to 75 with a mean of 46 ± 10.6 . Final surgical specimen pathology was diagnosed as malignant for 33 patients (33.7%) and benign for 66 patients (67.3%). Of the 33 malignant patients, 30 of them were papillary carcinoma and its variants, 2 of them follicular carcinoma, and 1 of them was Hurthle cell carcinoma. Thirty (30.%) patients required secondary (completion) surgery for malignant pathologies. Secondary surgeries were contralateral thyroid lobectomies in early postoperative period for proper follow-up and/or effective RAI treatment. After the surgery and nuclear medicine consultation, 25 patients required RAI ablation treatment. Control examination and scar assessment dates were ranging from 12 to 72 months with a mean of 46.4 months. After the surgeries, 4 patients encountered unilateral vocal fold paralysis and were diagnosed as permanent vocal fold paralysis. None of the patients required laryngeal framework surgery for vocal

Main Points

- The classical mid-cervical incision has positive long-term satisfactory results.
- The vast majority of the patients included in our study were satisfied with their surgical scars. Only 6 of 98 patients (6.1%) were found with a significant dissatisfaction level.
- There was no significantly different Observer Scar Assessment Scale (OSAS) scores in patients according to sex, body mass index, and incision length.
- Significantly higher OSAS scores were observed in patients who have secondary surgery, malignant pathologies, and radioactive iodine treatment.

Observer Scar Assessment Scale (OSAS) (Turkish Version)

	Normal deri	1	2	3	4	5	6	7	8	9	10	En kötü
Vaskülarizasyon		0	0	0	0	0	0	0	0	0	0	0
Pigmentasyon		0	0	0	0	0	0	0	0	0	0	0
Kalınlık		0	0	0	0	0	0	0	0	0	0	0
Kabarıklık		0	0	0	0	0	0	0	0	0	0	0
Esneklik		0	0	0	0	0	0	0	0	0	0	0
Toplam skor (min 5, max 50).....												
Genel gözlemci skar değerlendirmesi		0	0	0	0	0	0	0	0	0	0	0

Patient Scar Assessment Scale (PSAS) (Turkish Version)

	Hiç şikayeti yok	1	2	3	4	5	6	7	8	9	10	En kötü
Yara üzerinde ağrı var mı?		0	0	0	0	0	0	0	0	0	0	0
Kaşıntı var mı?		0	0	0	0	0	0	0	0	0	0	0
Yaranın rengi ne kadar dikkat çekici?		0	0	0	0	0	0	0	0	0	0	0
Yara sertliği ne kadar kötü?		0	0	0	0	0	0	0	0	0	0	0
Yaranın kalınlığı ne kadar dikkat çekici?		0	0	0	0	0	0	0	0	0	0	0
Yaranın düzensizliği ne kadar kötü?		0	0	0	0	0	0	0	0	0	0	0
Toplam skor: (min 6, max 60).....												
Hastanın genel skar değerlendirilmesi		0	0	0	0	0	0	0	0	0	0	0

Figure 1. Turkish version of observer and Patient Scar Assessment Scale.

fold paralysis. None of the patients encountered hematoma and required reoperation for hematoma control.

The mean overall satisfaction score was 1.77 (1: normal 10: worst), and the vast majority of the patients (92/98, 93.9%) were satisfied with their surgical scars. Only 6 patients (6.1%) have 6 or more overall satisfaction score. The digital photographic examples of some patients were shown in Figures 2–5.

Mean OSAS score was 7.00 ± 3.34 (ranging between 5 and 29) and PSAS score was 9.67 ± 6.58 (ranging between 6 and 34). There was a moderate statistically significant relationship between observer scar assessment scale (OSAS) scores and PSAS scores ($r=0.418, P < .001$).

Significantly higher OSAS scores were observed in patients who have secondary (completion of contralateral lobectomy) surgery, malignant pathologies, and RAI treatment ($P < .001$; $P = .009$; $P = .002$, respectively) (Table 1).

There were no significantly different OSAS scores in patients according to sex, BMI, and incision length. These data were summarized in Table 2.



Figure 2. Dissatisfied patient's hypertrophic scar appearance.



Figure 3. Fistulization on the scar causes a bad appearance.

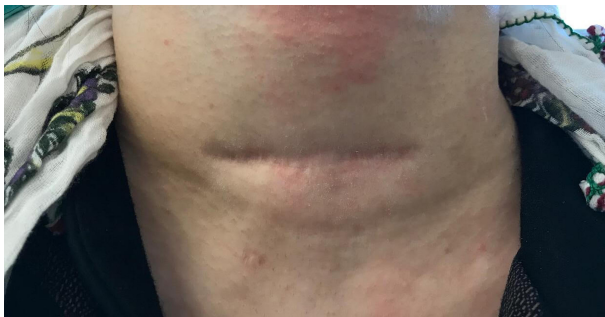


Figure 4. Depression on the scar causes an unsatisfied result.

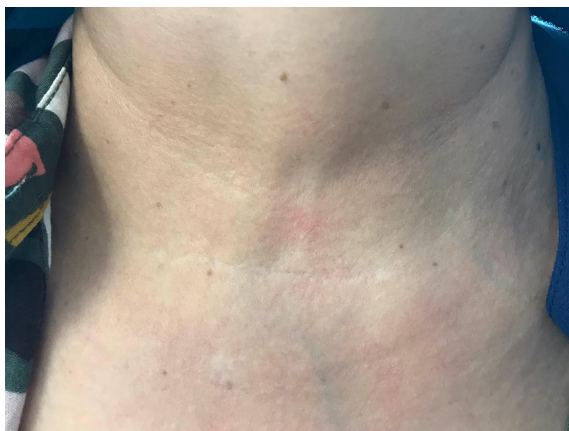


Figure 5. Excellent result of a patient.

Discussion

In today's modern world, perception of beauty and aesthetics is gradually changing and getting more important. Popular social media platforms that bring the beauty perception to the front positively support this change. Finally cosmesis becomes a priority for many patients. Classical mid-cervical Kocher incision is accepted as a standard for thyroid surgical procedures. The aesthetic problems related that incision may cause serious fear and anxiety. These concerns exist in various societies around the world, particularly among Asian women and these novel surgical procedures concerning scar cosmesis are performed more frequently in Asia compared to other parts of the world.¹¹ Recent studies concerning novel endoscopic and

Table 1. The Relationship Between Completion Surgery and Scar Satisfaction

	Mean OSAS
Secondary/completion surgery	
Performed	8.5 ± 3.5
Not performed	6.3 ± 3.1
	P < .001
Final pathology	
Malignant	8.0 ± 3.5
Benign	6.6 ± 3.2
	P = .009
Radioactive iodine treatment	
Performed	8.2 ± 3.7
Not performed	6.6 ± 3.1
	P = .002

OSAS, Observer Scar Assessment Scale.

Table 2. The Relationship Between Sex, Body Mass Index, Scar Length, and Scar Satisfaction

	Mean OSAS
Body Weight	
Normal (BMI = 18.5-24.9)	6.8 ± 1.6
Overweighted (BMI = 25-29.9)	7.0 ± 4.0
Obese (BMI > 30)	7.0 ± 5.8
	P = .472
Scar length	
<5 cm	6.3 ± 2.3
5.1-6.5 cm	6.8 ± 2.1
6.6-9 cm	8.3 ± 5.8
>8 cm	7.1 ± 2.8
	P = .054
Sex	
Male	6.3 ± 2.5
Female	7.2 ± 3.5
	P = .102

BMI, body mass index; OSAS, Observer Scar Assessment Scale.

robotic thyroidectomy techniques indicated that the cosmetic advantages, improved quality of life, and overall patient satisfaction but the longer operation time, hospital stay, and limitation of thyroid nodule size are still a problem for surgeons.^{5,12,13} Consequently, these techniques are not suitable and effective for all patients, and hereby, the conventional technique still maintains its validity.

The vast majority of the patients included in our study were satisfied with the appearance of their surgical scars. Only 6 of 98 patients (6.1%) were found with a significant dissatisfaction level. Similar to our results, Böhm et al¹⁴ reported the long-term cosmetic results after traditional mid-cervical thyroid

resection with more than 90% excellent or good cosmetic results.

There are several studies in the literature concerning about the incision size and satisfaction. In the study by Miccoli et al² in the postoperative first month, in another study by Bellantone et al¹⁵ in the postoperative 3rd–6th month, scar satisfactions were evaluated. They found that smaller incision sizes reflected positively on patient satisfaction in their studies. However, these were relatively short-term and relatively small sample-sized studies to assess the satisfaction of the patients.

Wound healing and remodeling are dynamic processes and last 8–12 months. Reasonably, scar evaluation before 12 months may not reflect the long-term satisfaction of patient.¹⁶ Aesthetic outcomes of neck scars improve with time, so we designed our study to evaluate our patients at least 1 year after the surgery in order to assess the long-term quality of life more accurately. The scar evaluations of our patients were performed after an average of 46.4 months after the surgery (range between 12 and 72 months). We did not find any significant differences related to incision size and satisfaction. Similar to our study, after the long-term evaluation of patients, many authors could not find any relation between the incision length and patient satisfaction.^{17,18} As a result, in our study, scar length does not affect the scar appearance and patient satisfaction by itself. The follow-up period of our study was longer compared with similar studies in the literature. In our opinion, there may be other factors affecting patient satisfaction besides the scar length, such as asymmetry, vascularization, depression, and so on.

In our study, we found secondary/completion surgery, malignant pathologies, and radioactive treatment as the significant factors for worse scar appearance and unsatisfaction. Secondary surgeries were completion contralateral thyroid lobectomies for malignant pathologies in early postoperative period (generally in the first month postoperatively). Even if all primary procedures are performed according to the guidelines and oncologic principles, secondary surgeries due to residual or recurrent disease may be inevitable. Incidence rate of reoperative thyroid surgery ranged from 4.1% to 10.7% in literature.^{19–21} One might expect that reoperative surgery during the healing and remodeling period may negatively affect the scar appearance. Most of the patients who had radioactive treatment also required secondary/completion surgery. This may be the reason for unsatisfactory scar appearance beyond the systemic or local effect of the radioactive treatment. Reasonably, reoperative thyroid surgery especially completion surgery for residual disease is associated with higher complication rates.²² The scar tissue due to previous surgery makes it difficult to recognize and preserve the critical structures such as RLN or the parathyroid glands. The poor scar appearance revealed by our study is one of the neglected conditions of reoperative thyroid surgery.

In literature, there are many studies reporting the more unsatisfactory scar results in females comparing with males.^{23,24} In our study also, females have worse scar appearance scores, but this difference was not statistically significant ($P=.102$).

Also, this study did not demonstrate any significant relation between patient satisfaction and age, histopathology, BMI, and comorbidities of the patients.

As a result, the classical mid-cervical incision has positive long-term satisfactory results. Even though a small number of patients complain about the shape of their scars, we must take important precautions such as careful positioning of incision, degree of retraction necessity, and careful skin closure by being gentle to the tissue for better results.^{18,25} In a recent systematic review concerning the optimal wound closure for thyroid surgery, the closure of the skin with subcuticular sutures is recommended. Patients benefit better from short-term cosmetic results with subcuticular sutures comparing staples and glue, but long-term results were not influenced by closure method.²⁴ Despite the successful results of endoscopic novel techniques in the treatment of thyroid diseases, some reservations still remain about the control of the disease, especially in malignant and large nodule size conditions.^{26,27} Long-term positive satisfied results of classical mid-cervical incision still have positive aspects compared to new endoscopic and robotic techniques.

Patients requiring early secondary (completion) thyroidectomy should be informed about the possible unsatisfactory results and the surgeon should pay more attention and act as carefully as possible for skin closure. Patient-specific factors affecting the wound healing not covered in this study may be the missing aspect and limitation of this study.

Ethics Committee Approval: This study was approved by Haseki Research and Education Hospital Ethical Committee, Istanbul (Approval No: 98-2021).

Informed Consent: Written and verbal informed consent was obtained from all participants who participated in this study.

Peer-review: Externally peer-reviewed.

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