

**ORIGINAL ARTICLE**

# Thyroidectomy with discharge on the same day

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## Abstract

**Introduction:** Thyroid surgery has been performed by hospitalization with the admission period exceeding 24 hours. Surgeries that allow same-day discharge reduce spending, promote greater turnover and utilization of hospital beds, and generate high patient satisfaction. However, in the thyroidectomy, the risk of hematoma and hypocalcemia are factors that cause resistance toward early discharge. **Objective:** The aim of this study is to describe a series of patients undergoing thyroidectomy with same day discharge, focusing on the procedure safety and patient satisfaction. **Methods:** A prospective study of patients undergoing thyroidectomy with same day discharge, compared with who were discharged on the first postoperative day or after, assessing clinical characteristics, type of surgery, weight of the gland, complications, and patient satisfaction. **Results:** A total of 105 patients were discharged on the same day, whereas 157 on the first postoperative day or after. There were no significant differences observed in the two groups' complication rates. No patient who was discharged on the same day required hospital readmission. In the group of patients who were discharged on the same day, patient satisfaction was 98.1%. **Conclusion:** The same-day discharge procedure, in selected cases, proved to be safe and had a high satisfaction rate.

**Keywords:** thyroidectomy; ambulatory surgical procedure; length of stay.

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## Introduction

Previously thyroidectomy was a procedure that required hospitalization and had an admission period that exceeded 24 hours. However, early discharge could produce benefits such as decreased hospital costs, increased turnover of beds, reduced risk of nosocomial infections associated with prolonged hospitalization, and improved patient satisfaction<sup>1</sup>.

Surgeries that allow the patient to be sent home with a shorter hospitalization time are typically divided into "short-stay surgery" (SSS), in which the patient is discharged on the next day after surgery, and "day surgery" (DS), with the discharge happening on the same day. The terms "outpatient surgery" and "same day surgery" are also used but are often incorrectly applied<sup>2</sup>.

Specifically, in thyroid gland surgery, the risk of postoperative bleeding and hypocalcemia, which can cause serious problems in the patient, are arguments

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against early discharge. However, publications demonstrating the possible use of DS in thyroidectomy have been presented since the 1980s, with positive results<sup>3,4</sup>. In the USA, database analysis has shown an overall increase in SSS and DS approaches to thyroid surgery and thyroidectomies<sup>5,6</sup>. In Brazil, however, there have been few studies dealing with this topic until now, with most focusing on SSS approaches<sup>7</sup>.

The aim of this study was to describe a series of patients undergoing thyroidectomy with discharge on the same day, focusing on the procedure's safety and patient satisfaction.

## Materials and methods

We prospectively evaluated patients undergoing thyroidectomy who were discharged the same day (DS Group) or on the first postoperative day or after (Control Group) between July 2012 and June 2015 in the *Hospital Regional do Oeste*. The study was approved by the ethics committee of the hospital (protocol number 001/13), and the patients signed an informed consent form.

Patients with total or partial thyroidectomy, including planned cases of reoperation, were included. Patients were informed about the surgical procedure during the preoperative visit and the option of DS or discharge on the day after or later (Control Group) was presented. The decision about DS or later discharge and inclusion of patients in the DS Group or in the Control Group was made by the surgeon, in accordance with the patient or his/her guardian, when applicable, after the surgery during the postoperative evaluation. The discharge was scheduled 8 hours after the surgery, at which time the surgeon evaluated the patient's clinical condition.

### Exclusion criteria for DS before the surgery:

- patients who could not understand the implications of surgery and the orientations;
- who do not have adult accompaniment at their residence;
- who would not be able to easily access a hospital within a maximum of 1 hour.

Exclusion criteria for DS at the time of hospital discharge:

- patients who had not eaten;
- who had nausea, vomiting, or other adverse reactions;
- who had not left the bed;
- who had not urinated;
- who had altered blood pressure;
- who had compressive symptoms in the neck, bulging, or cervical bruising;
- who had pain that was not controlled by a combination of up to three analgesics (dipyrone, ketoprofen and tramadol).

All patients were operated on by the same surgeon (MAST), and those who opted for DS received verbal and written guidance on postoperative care and

were advised about the potential complications. Additionally, these patients received two phone numbers to contact for any questions or concerns.

The procedures were performed without the use of an intraoperative nerve monitoring system, ultrasonic scalpel or electrothermal bipolar device.

All patients who were submitted for total or totalization thyroidectomy (both the DS Group and Control Group) were prescribed 2 to 3 g of calcium carbonate orally per day, empirically.

On the first postoperative day, the patients were contacted by phone to determine their clinical conditions. The return visit occurred between the fifth and tenth postoperative day. Possible postoperative complications (hematoma, seroma, infection, symptoms of hypoparathyroidism, and mobility of the vocal cords) were analyzed. If any complication was identified, the patient was followed until the complication was fully resolved or was considered irreversible.

Laryngoscopy was performed in all patients before and after thyroidectomy. Permanent vocal cord paralysis was defined when present on postoperative fiberoptic laryngoscopy and lasting more than 1 year after the surgery.

Hypocalcemia was classified as permanent when parathyroid hormone (PTH) levels were insufficient to maintain normal calcium levels 6 months after surgery.

At their return visit, patients were surveyed with regard to the following: 1) their satisfaction with the DS, 2) if they would hypothetically do it again, and 3) if they would recommend it to others. A positive response to all the questions was considered as patient satisfaction with the procedure, and it was considered as patient dissatisfaction if any of the responses were negative. The questions regarding patient satisfaction were designed specifically for this study, and the possible answers were "yes" or "no".

Clinical characteristics, type of surgery, gland weight, complications, and patient satisfaction were analyzed and compared between groups (DS and Control).

Statistical analysis was performed with SPSS 13.0 for Windows (SPSS Inc., Chicago, IL, USA).

Descriptive statistics of the absolute and relative frequencies were used to describe the categorical variables. Central tendency measures (mean and/or median) were used to describe the numerical variables.

Comparison of the DS and Control Groups and the occurrence of complications in the groups were performed using the Chi-square test for categorical variables and Student's t-test or the Mann-Whitney U test for numerical variables.

Statistical significance was defined as a  $p$  value  $< 0.05$ .

The authors had no conflicts of interest in completing this study.

## Results

### DS Group:

The DS Group included 105 patients, 92 of whom (87.6%) were female. The mean age was 50 years (range, 14 to 78 years of age). According to the

American Society of Anesthesiologists (ASA), 70 patients were classified as ASA I (66.7%), 33 as ASA II (31.4%), and two as ASA III (1.9%).

The fine needle biopsy (FNB) revealed a benign diagnosis in 30 (28.6%) patients and a diagnosis of cancer or suspected cancer in 52 (49.5%) patients. In the other patients, FNB was not performed or had an inconclusive result.

Concerning the type of surgery, 29 (27.6%) patients underwent partial thyroidectomy, 66 (62.9%) total thyroidectomy, four (3.8%) total thyroidectomy with paratracheal lymphadenectomy, and six (5.7%) totalization thyroidectomy.

The weight of the excised thyroid glands ranged from 5 to 463 grams (median, 25 grams).

Surgical complications occurred in seven (6.7%) patients, including permanent hypocalcemia in one (0.9%) patient, permanent paralysis of the unilateral vocal cord in two (1.9%) patients, temporary paralysis of the vocal cords in two (1.9%) patients, and seroma in two (1.9%) patients. No patients required hospital readmission.

Pathological examination revealed 76 cases of goiter or adenoma (72.4%) and 29 carcinomas (27.6%), of which 21 were papillary (72.4%), six follicular (20.7%), and two medullary (6.9%).

Of the 105 patients in the DS Group, two (1.9%) patients said that they were unsatisfied, with their reasons being "empty feeling in the neck" in one patient (which caused a high level of anxiety) and "severe pain" in the other patient.

### **Control Group:**

In the same period, 157 patients were discharged on the first postoperative day or after. Of these, 136 patients were discharged on the first postoperative day (86.6%), 19 on the second postoperative day (12.1%), and one on the third postoperative day (0.6%). One patient had a prolonged hospitalization (20 days) and died as a result of clinical complications.

Most of the patients, 128 (81.5%), were female. The mean age was 49.7 years (range, 6 to 85 years). With regard to ASA classification, 108 patients were classified as ASA I (68.8%), and 49 patients were classified as ASA II (31.2%).

The FNB results were benign in 38 (24.2%) patients, cancer or suspicious in 85 (54.1%) patients, and was not performed or had inconclusive results in 34 (21.7%) patients.

The thyroidectomies that were performed included 33 (21.0%) partial, 83 (52.9%) total, 15 (9.5%) total with paratracheal lymphadenectomy, 15 (9.5%) total with functional and paratracheal lymphadenectomy, three (1.9%) total with functional and paratracheal lymphadenectomy, two (1.3%) total with paratracheal lymphadenectomy, and six (3.8%) totalization thyroidectomy.

The weight of the excised thyroid glands ranged from 3 to 780 grams (median, 30.0 grams).

Complications were observed in 22 (14.0%) cases, including two cases of transient hypocalcemia (1.3%), one case of permanent hypocalcemia (0.6%), four cases of permanent paralysis of the unilateral vocal cord (2.5%), seven

cases of temporary paralysis of the vocal cords (4.5%), five cases of hematomas (3.2%), two cases of seromas (1.3%), and one clinical complication that resulted in death (0.6%).

Pathological examination showed 96 goiters or adenomas (61.1%) and 61 malignant tumors (38.9%). Among the malignant tumors, 48 were papillary (78.7%), 4 were follicular (6.6%), 8 were medullary (13.1%), and 1 was poorly differentiated (1.6%).

### Comparison Between the DS Group and Control Group:

Tables 1 and 2 describe and compare the cases between the DS Group and Control Group. The two groups showed no significant differences in overall preoperative characteristics (Table 1).

**Table 1.** Preoperative characteristics of the Day Surgery and Control Groups.

Variables	DS Group (105 cases)	Control Group (157 cases)	p
	n (%)	n (%)	
<b>Mean age (years)</b>	50.0	49.7	0.86*
<b>Gender</b>			0.188**
Female	92 (87.6)	128 (81.5)	
Male	13 (12.4)	29 (18.5)	
<b>FNB achievement</b>	84 (80.0)	132 (84.1)	0.395**
<b>FNB result</b>			0.697**
Cancer/Suspect	52 (49.5)	85 (54.1)	
Benign	30 (28.6)	38 (24.2)	
Inconclusive/NP	23 (21.9)	34 (21.7)	
<b>Comorbidities</b>			
Arterial hypertension	26 (24.8)	30 (19.1)	0.274**
Diabetes mellitus	4 (3.8)	8 (5.1)	0.626**
Others	12 (11.4)	20 (12.7)	0.751**
<b>Previous thyroidectomy</b>	6 (5.7)	11 (7.0)	0.677**
<b>ASA</b>			0.888**
I	70 (66.7)	108 (68.8)	
II	33 (31.4)	49 (31.2)	
III***	2 (1.9)	0	

\*Student's t-test; \*\* Chi-square test; \*\*\* Not included in the analysis.

Caption: DS = Day Surgery; FNB = Fine needle biopsy; NP = Not performed; ASA = American Society of Anesthesiologists.

**Table 2.** Intraoperative and postoperative characteristics of the Day Surgery and Control Groups.

Variables	DS Group (105 cases)	Control Group (157 cases)	p
	n (%)	n (%)	
<b>Surgery schedule</b>			<0.001*
Morning	94 (89.5)	43 (27.4)	
Afternoon/Night	11 (10.5)	114 (72.6)	
<b>Thyroidectomy</b>			0.218*
Total/totalization	76 (72.4)	124 (79.0)	
Partial	29 (27.6)	33 (21.0)	
<b>Cervical lymphadenectomy</b>	4 (3.8)	35 (22.3)	<0.001*
<b>Drain use</b>	70 (66.7)	125 (79.6)	0.019*
<b>Discharged without drain***</b>	4 (5.7)	41 (32.8)	<0.001*
<b>Hospital readmission</b>	0	1 (0.6)	NA
<b>Specimen weight mean (grams)</b>	49.9	63.4	0.189**
<b>Final biopsy</b>			0.061*
Benign	76 (72.4)	96 (61.1)	
Cancer	29 (27.6)	61 (38.9)	
<b>Complications</b>	7 (6.7)	22 (14.0)	0.063*

\*Chi-square test; \*\*Mann-Whitney U test; \*\*\*% regarding drained cases.  
Caption: DS = Day Surgery; NA = not analyzed.

On the other hand, as shown in Table 2, most surgeries (89.5%) were realized in the morning period in the DS Group. In this group only four (3.8%) lymphadenectomies were performed, and fewer cases were drained. When drainage was required, more patients were discharged with the drain. There was a trend, which was not statistically significant, of there being more benign cases in the DS Group. There were no differences in the type of surgery and weight of the specimen. One case of hospital readmission occurred in the Control Group for suspicion of hypocalcemia that ended up not being confirmed. When comparing the two groups with regard to the overall number of complications, there was a trend, which was not statistically significant, of more complications appearing in the Control Group.

## Discussion

Many clinicians who resist adopting DS for thyroid surgery argue that complications that are not diagnosed and treated in a timely manner can lead to death. Such risks are represented by cervical hematomas, which can

result in airway obstruction caused by laryngeal and pharyngeal mucosal edema, and hypoparathyroidism with consequent hypocalcemia<sup>8-9</sup>.

Farrar found in 1983 that hematomas occurred within the first 8 hours after surgery<sup>10</sup>. In 1986, Steckler was the first to publish a series of thyroidectomy cases with a same-day discharge and concluded that DS was a safe procedure<sup>3</sup>. Other publications have emerged, always pointing to the safety of early discharge<sup>11-12</sup>. However, other authors disagree. Leyre et al. described 70 cases of hematoma, of which 37% required reoperation between 7 and 24 hours after surgery and 10% required reoperation thereafter; consequently, they concluded that DS was an unsafe procedure<sup>8</sup>. Similarly, Rosenbaum et al. observed hematomas occurring beyond the eighth hour postoperatively<sup>9</sup>.

In contrast, Snyder et al.<sup>3</sup> and Materazzi et al.<sup>4</sup> suggested that the occurrence of late hematomas was infrequent, representing a very small number of patients, and they took this finding to mean that remaining hospitalized overnight was not justified. Moreover, the occurrence of this complication, which is unpredictable, does not necessarily mean that the patient should be submitted to reoperation. It is unclear whether all cases would have respiratory distress if they were not submitted to reoperation, or if in some of them, simple observation would be enough. Some situations have been described in which a late hematoma did not require a new surgery<sup>15</sup>. Dixon et al. said that airway impairment was meaningful only when it occurred immediately after surgery, specifically in the anesthetic recovery room<sup>16</sup>.

Moreover, the occurrence of a hematoma in patients outside the hospital does not mean that it would develop differently from that in hospitalized patients because the patient selected for DS received guidance on the possible signs and symptoms. Additionally, one of the selection criteria for DS was quick and easy access to a hospital. Finally, a hospital stay does not necessarily mean greater security for patients<sup>17</sup>. In our study, there were five cases of postoperative hematomas, which were included in the Control Group, because none of them occurred more than 8 hours after surgery. Four of these cases were diagnosed in the anesthetic recovery room, and three of them required surgical intervention. All patients were discharged the next day, even the patients requiring reoperation.

Hypoparathyroidism with resulting hypocalcemia has been described in between 7% and 36% of total thyroidectomy cases<sup>18</sup>. The intraoperative findings (observation of the parathyroid glands and preserving them) can provide some valuable information about the occurrence of postoperative hypocalcemia; however, it is not a sufficiently safe parameter<sup>19,20</sup>. Many authors have advocated routine intraoperative PTH measurements to predict the occurrence of this complication, thus selecting patients who should be closely observed or promptly treated<sup>21</sup>. When an early discharge is planned, these measurements could help in the decision about sending patients home with or without calcium supplementation or in the decision to keep the patients hospitalized. Nonetheless, this assay is not available in many hospitals. As a result, an option is the empirical use of oral calcium replacement when the PTH assay is not available. It is a valid and inexpensive strategy (with insignificant side effects) that allows early discharge<sup>18</sup>. Therefore, the risk of hypocalcemia is no longer a concern with regard to discharge on the

same day. In the DS Group, which received oral calcium supplementation, there were no symptomatic cases of hypocalcemia, and only one patient who developed permanent hypoparathyroidism had minor symptoms after discontinuation of calcium without the need for rehospitalization.

Death is a rare complication of thyroidectomies. However, in this series, one death occurred. She was a 73-year-old lady that presented with respiratory distress requiring intensive care support after surgery. She later developed a lung infection that was not reversed.

In addition to the fact that eliminating possible complications necessarily requires hospital support, it must be determined whether the pain and discomfort of surgery can be relieved without the use of intravenous medications, if the bandages can be managed by the patient or family, and if the patient will be able to carry out their basic daily activities, such as feeding and personal hygiene. Thyroidectomy is a well-tolerated procedure and easily satisfies the above criteria<sup>2</sup>. Many patients in our study were discharged with a cervical drain, which has also been reported by other authors,<sup>22,23</sup> and is not an impediment to DS. In the beginning of this study, drainage was used more frequently, but currently, it is reserved for select cases.

Snyder et al. asserted that it is difficult to establish strict criteria to select patients who would be candidates for DS<sup>13</sup>. However, the consensus is that it is necessary to evaluate the socioeconomic conditions of the patient, such as access to fast and effective means of communication (by phone) and transport, and the interaction between physicians (who may perhaps assist the patient the first time) and the surgeon<sup>24</sup>. In the present study, the period of displacement of 1 hour between home and a support hospital was used as an eligibility criterion. However, this period should be individualized, because in some metropolitan areas, the time to go the same distance can vary as a result of several factors. In addition to these issues, the patient's preoperative and postoperative orientation are essential, influencing the selection of patients with motivation for the proposed procedure and excluding high-risk patients. Since the decision about DS was made at the time of discharge, careful selection can be evidenced in our series, where in the DS group, most surgeries were performed in the morning, which had a lower number of cases submitted to lymphadenectomy or drainage. In addition, there were trends, which were not statistically significant, of more benign cases in the DS Group and of more complications in the Control Group. Similarly, considering that a child may not be able to complain clearly about alert symptoms, a 6-year-old child who underwent total thyroidectomy was maintained in the Control Group.

Another point that must be discussed is the number of complications that occurred in relation to each surgeon and between institutions<sup>25</sup>. It is supposed that high-volume surgeons and institutions have lower complication rates than their low-volume counterparts. The broadest published study focusing on this issue is a meta-analysis that found shorter hospital stay, lower costs and lower in-hospital mortality rates when surgeries were performed by high-volume surgeons (70 surgeries/year) and high-volume institutions (200 thyroidectomies/year)<sup>26</sup>. However, a direct relationship between the surgeon's degree of experience and the possibility of early discharge has not

been analyzed yet. In addition, hematomas usually occur in the early hours after the procedure, regardless of the experience of the surgical team<sup>10,13,14</sup>.

Although there is a tendency to accept DS, there is a lack of consensus on the subject. The American Thyroid Association<sup>27</sup> and the Association Francophone de Chirurgie Endocrinienne<sup>28</sup> have issued opinions regarding this discussion, exposing both the advantages and the risks without providing a final guideline.

In this series of cases, we observed that, in selected cases, DS is safe and produces high satisfaction rates (98.1%).

We believe that the high patient satisfaction rate was a result not only of the patient's experience outside the hospital and the return home but also of the patient's feeling of having a "procedure above expectations."

Early discharge could produce other benefits, such as a reduction in hospital costs and an increase in bed turnover. After defining the safety of the procedure, cost savings becomes very important, especially when resources are limited, as in some public health systems. However, evaluating cost was not the aim of this study, but it may be the subject of an upcoming study.

The keys to the success of DS thyroidectomy is the careful selection of patients, particularly in regard to clinical and sociocultural characteristics, in addition to extensive dialogue and guidance on care in the postoperative period by an experienced and engaged medical team. Currently, DS has been used routinely by the author in selected cases.

## Conclusion

The same-day discharge procedure, in selected cases, proved to be safe and had a high patient satisfaction rate.

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