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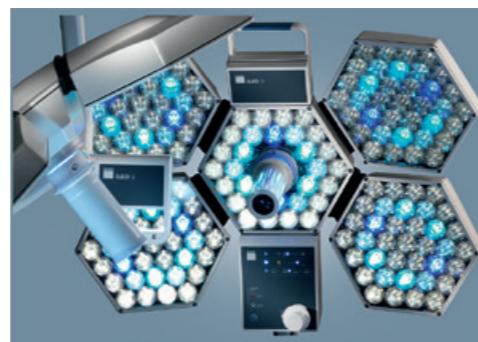
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## POSTOPERATIVE COMPLICATIONS IN PATIENTS UNDERGOING THYROID SURGERY

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### ABSTRACT

**Background and objectives:** Postoperative complications from thyroid surgery are numerous and may be shown on different levels. Some of these complications may be detrimental for patients, so minimization of the risks should be always considered. We evaluated the postoperative complications in patients after surgery of the thyroid gland at the Clinic for Thoracic Surgery, Skopje.

**Material and method:** In retrospective manner, all patients undergoing thyroid surgery during the one-year period (1. January- 31. December 2017) were evaluated. Patients were divided into two groups, whereas group ST included patients who underwent goiter removal and subtotal thyroidectomy while group TT included patients in who total thyroidectomy was done. In both groups we analyzed the demographic data and the occurrence of postoperative (in the first 48 hours) complications (stridor, hoarseness, hemorrhage, nerve dysfunction, tracheomalacia, hypocalcemia and the need for reintubation and tracheostomy).

**Results:** Total data from 197 patients was evaluated. 120 patients had subtotal thyroidectomy while total thyroidectomy had 77 patients. Postoperative complications occurred in significantly larger number of patients in the TT group (64.9 vs. 40%). Hoarseness (8.4% vs. 18.5%), stridor (18.3% vs. 9.2%) tracheomalacia (5% vs. 1.2%) and hematoma (2.5% vs. 3.8%) occurred in respect to the groups. Hypocalcaemia occurred in significantly larger number of patients in TT group. Permanent nerve injury was found in one patient in the same group and tracheotomy was done only in one patient.

**Conclusion:** Overall results from our study show that the complications after thyroid surgery occur in all patients who undergo thyroid surgery. However, more severe complications and outnumbered are complications in patients who undergo total thyroidectomy.

**Key words:** complications, occurrence, thyroid surgery, total thyroidectomy.

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## Introduction

Thyroid gland surgeries are considered to be routine interventions, but many aspects of the nature of the thyroid diseases, as well as the pre and perioperative features might interfere and lead to unwanted complications, higher morbidity and mortality (1).

Literature data show reports where complications after thyroid surgery are reported to be numerous and at different levels. Mainly, studies analyzed patients in whom total thyroidectomy was done, but reports of complications in patients with single or multimodal goiter removal and subtotal thyroidectomy are poorly noted in the literature (2, 3). Even though this is completely logical, because medicine is decisive that total thyroidectomy may lead to more postoperative complications, the fact is that any thyroid surgery increases the risk for postoperative complications like bleeding, recurrent laryngeal nerve (RLN) injuries, hoarseness, hematomas, hypocalcemia, hypoparathyroidism etc. (2). However, not a single postoperative complication has been systematically investigated yet.

Despite the surgery undertaken majority of these complications are directly correlated to the magnitude of the goiter, type of histopathological findings, position of the changes on the gland (retrosternal), experience of the surgeon, difficulties of airway management, intubation trauma and several other factors that may result in higher morbidity (1,3). When these complications are evaluated from anesthesiology aspect, consideration that interfere with difficult airway management, difficult intubation, post-extubating stridor, need for prolonged intubation and need from reintubation, should be discussed (3).

The aim of this study was to analyze and evaluate the occurrence of postoperative complications in all patients who underwent thyroid gland surgery in a retrospective manner.

## Material and method

In a retrospective study, we evaluated the records of all patients who underwent thyroid gland surgery at the Clinic for Thoracic Surgery during one-year period (1 January-31 December 2017). The records of patients were analyzed for demographical and type of the surgery data.

Patients were divided into two groups whereas in Group ST- included patients who had thyroid surgery for goiter (where goiter was removed, and subtotal thyroidectomy was done), while Group TT -included patients who underwent total thyroidectomy for confirmed malignances of the thyroid gland.

In the group ST we analyzed the physical exploration of the goiter/s and the compressive symptoms (Grade I - not visible and palpable, Grade II- visible and palpable, Grade III- compressing the neighborhood structures).

In both groups of patients, we analyzed the preoperative hormonal status and postoperative complications (during the first 48 hours) that included: post-extubating stridor as well as hematomas, hoarseness, tracheomalacia, hypocalcemia whether clinical or by laboratory (<2.1mmol/l) findings, injury of recurrent laryngeal nerve, tracheomalacia as well as the need for reintubation, second intervention, and tracheotomy during the first 48 hours.

Patients who had predicted difficult intubation (Mallampati III, IV), older than 75 years, ASA grade IV, patients with present Pemberton sign (obstruction of Vena cava superior syndrome) and patients with preoperatively paralysis of the vocal cord (assessed by ENT specialist) were excluded from the study.

## Results:

Retrospectively 213 patients had thyroid surgery for the one-year period. Out of them 16 were excluded from the study according to the excluding criteria, leaving total of 197 patients for further analyzes.

Out of 197 patients, group ST (where goiter, multimodal goiters and subtotal thyroidectomy was done) included 60.9% (120 patients), while group TT (where total thyroidectomy was done) included 39.1% (77 patients) of the patients.

Most of the patients in both groups were female, ASA grade II and Mallampati grade I. In both groups most of the patients had hypertension as a co-morbidity. Demographic and clinical data of the patients are shown in Table 1.

Table 1. Demographic and clinical data of the patients.

	Group ST (n=120)	Group TT (n=77)
Age(mean+Sd)	50.05+14.56 Sd	54.3+12.2 Sd
Female/male ratio (%)	82.5%/17.5%	61.1%/38.9%
ASA (%)		
I	20,8%	20.8%
II	75.8%	77.9%
III	3.4%	1.3%
Mallampati (%)		
I/II	65.8%/34.2%	70.1%/29.9%
Duration of surgery(min) (mean+Sd)	107+33.1Sd	103.2+37.5Sd

\*ASA- American society of Anesthesiologists; Sd-Standard deviation

Preoperative hormonal status showed that most of the patients in both groups were euthyreotic. In group ST, 95 patients (79.2%) were euthyreotic, 17 patients (14,2%) were hyperthyreotic and 8 patients (6.6%) were hypothyreotic. In the same group physical exploration of the goiter/s and the compressive symptoms showed that the change was palpable but not visible in 70 patients (58.3%), visible and palpable in 40 patients (33.3%) and compressing the neighborhood structures in 10 patients (8.4%). Intrathoracic component was present in 8 patients from group ST. On the other hand, in group TT, 68 patients (88.3%) were euthyreotic, 6 patients (7.8%) hyperthyroid and 3 patients (3.9%) were hypothyreotic. In both groups most of the patients were intubated on the first attempt.

Nonsystematic evaluation of the complications showed that postoperative complications were found in group TT when compared to group ST (64.9% vs 40%). In other words, only 27 patients who had total thyroidectomy did not have any complications while 72 patients who underwent subtotal thyroidectomy.

Table.2. Occurrence of complications in both groups.

Complication	Group ST (n=120)	Group TT (n=77)
Post-extubating stridor	8.4 % (10 patients)	18.5 % (15 patients)
Post extubating hoarseness	18.3% (22 patients)	9.2% (7 patients)
Hypocalcaemia	2.5% (3 patients)	26% (20 patients)
Transitory RLN injury	0,8% (1 patient)	3.8% (3 patients)
Permanent RLN	/	1.2% (1 patient)
Tracheomalatia	5% (6 patients)	1.2% (1 patients)
Hematoma	2.5% (3 patients)	3.8% (3 patients)

The need for reintubation occurred in 3 patients (2.5%) in group ST and all of these patients had preoperative grade III status of the goiter. In one of them mechanical ventilation for 24 was needed. None of the patients in this group underwent tracheostomy while in group TT one patient had early tracheostomy due to permanent RLN damage. Right-sided transitory RLN injury was found in both groups.

## Discussion

Our evaluation study of the complications after thyroid surgery showed that all patients who undergo thyroid surgery might show postoperative complications. However, more severe complications and outnumbered are complications in patients who undergo total thyroidectomy.

Post extubating hoarseness in our study occurred in 18.3% in patients with subtotal thyroidectomy, while in 9.2% of patients with total thyroidectomy. These findings are not specific because the literature confirms that this complication is considered to be the most often complication in patients after total thyroidectomy (1,4,5). When discussing this complication, we must not forget the etiological factors. Etiologically, hoarseness might occur due to several factors (RLN injury, intubation trauma, extubating manipulations, vocal cord dysfunction or as a result of post thyroidectomy central compartment syndrome, duration of surgery) and etc. (4,5). Differentiating the ethology for this complication include several specific diagnostic tools. Overall for this complication the literature reports incidence is estimated to be up to 50% of all thyroidectomized patients, out of this of patients' hoarseness in 28.5% characterized as transitory in 10.7% as permanent and in 17.9 % of with unknown clinical outcome (4).

Additionally, in our study postoperative stridor was found in 8.4% vs. 18.5% in respect to the groups. Post extubation biphasic stridor mainly may occur as a result of above explained mechanisms, but literature presents that the key role is damaged RLN (5). After extubation, biphasic stridor, respiratory distress and aphonia occur, due to unopposed adduction of vocal cords and closure of glottic aperture necessitating immediate intervention and emergency intubation or tracheostomy (6).

Considering the results for hoarseness and stridor as complications in our study and differences of the global burdens results for complications after thyroid surgery may be due to several factors. Firstly: in our study we only evaluated the percentage of occurrence and not the clinical outcome. Secondly: our study was retrospective, so only the data for the presence of hoarseness and stridor was estimated only through the data from the post anesthesiology recovery unit (which covers information for the 3 hours after the surgery), thirdly: we gathered the information for the first 48 hours post operatively and fourthly: laryngeal complications of tracheal intubation can be seen as these complications during the early postoperative period (which covers our study), so we cannot directly compare our results with the findings from several other studies (5,6,7).

When we discussed the above-mentioned complications (hoarseness and stridor), besides the fact that we explained the results from our study from different angles, we must emphasize that they mainly occur due to RLN injury. RLN injury is estimated to occur in up to 14 % of all thyroidectomized patients (3,4,5,6). Due to retrospective nature of our study and from the postoperative indirect laryngoscopy data (which were performed to identify recurrent laryngeal nerve damage), we can only say that from the gathered data permanent RLN injury was found in 1 patient in the TT group. This is the patient that underwent early tracheostomy.

Tracheomalatia was found in 5% vs. 1.2% of the patients in our study. Tracheal collapse following thyroid surgery is a result from prolonged tracheal compression by large mass (7, 8). From our results and considering the fact that in the ST group, according to the physical examinations of the goiter, the change was palpable, but not visible in 70 patients (58.3%), visible and palpable in 40 patients (33.3%) and compressing the neighborhood structures was in 10 patients (8.4%) higher occurrence rate of tracheomalatia was found in this group. This is life-threatening complication and should be considered before extubating and treatment requires reintubation and/or tracheostomy or some forms of tracheal support such as ceramic rings (6,8). Unfortunately, in our study we did not evaluate the weight of the goiters and the weight of thyroid gland which according to many authors has direct correlation to the tracheomalatia.

Global burdens show data that after thyroidectomy for large multinodular goiter the incidence of temporary hypocalcaemia occurs in 20% of patients about 36 h, postoperative (9). In our study, hypocalcaemia in the patients with total thyroidectomy was registered in 26% of the patients. Our results are in correspondence to the other authors' studies. However, this complication might be reduced by more careful inspection of the thyroid capsule. (6-8)

### Limitations and Suggestions

Our study is limited in several aspects. It is retrospective, it gathers data from the first 48 hours, it does not measure the outcome, it does not analyze the patients from the preoperative therapy and the study does not include large number of patients. Despite the limitations this study is beneficial to the medicine and everyday surgery due to the fact that no study yet has been published that evaluated the complications after the subtotal thyroidectomy. This study opens the door for furthermore systematically, prospective and randomized studies.

### Conclusion

Postoperative complications after thyroid surgery vary and can be on different levels. However, more severe and outnumbered are complications in patients who undergo total thyroidectomy. The most important factor is to have early recognition and prompt reaction for treatment of these complications otherwise they may be **detrimental for the patients.**

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## PRIMARY HYPERPARATHYROIDISM IN PREGNANCY

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### ABSTRACT

In this article, we report a case of a primary hyperparathyroidism in a young woman, as a result of the adenoma of a parathyroid gland, detected few days after delivery. Suspicion for primary hyperparathyroidism was achieved after different clinical features had been seen in the newborn (respiratory insufficiency, neonatal hypocalcaemia and recurrent convulsions).

The aim of this article is to emphasize the importance of the early detection of hyperparathyroidism in pregnancy with adequate control of calcium, phosphates and magnesium, in order to additionally prevent disturbances of the neuromuscular feasibility and other changes in the newborn. Even though, the early treatment of hyperparathyroidism in pregnant woman, needs to be individualized for every case (conservative or surgical treatment), in this article we also present the surgical treatment postpartum and the aspects of how calcium metabolism is changed in pregnancy and why this state may be overviewed by clinicians.

**Key words:** hyperparathyroidism, neonatal hypocalcemia, parathyroidectomy, pregnancy

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