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The role of drain in thyroid surgery

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Introduction. The function of drains in thyroid surgery has long been a matter of discussion, with the possible advantages of avoiding complications being weighed against the risks and discomfort they could cause. By examining not only what is medically effective but also what actually benefits the patient's recovery and well-being.
Aim. To assess the importance of the drainage with the thyroidectomy operations.
Materials and methods. A retrospective study was conducted over four years and included 148 patients that had thyroid surgery without using a drain. The ultrasound was used preoperatively in classifying the thyroid pathologies and the sizes of the gland and postoperatively in assessment and treatment of surgical site collection. The hospital stay, post-operative complications related to surgical drainage, and the way of dealing with them for each patient were recorded.
Results. The types of goiter were 8 diffuse, 68 multinodular, and 72 solitary thyroid nodule that were treated by different types of thyroidectomies without drainage (25 by subtotal thyroidectomy (16.8 %), 12 by total lobectomy and isthmesctomy (8.1 %) and 111 by total thyroidectomy (75 %)). There were no operation site collections in 94 % of the cases; 9 cases only had developed post-operative collection, and all were resolved by simple needle aspiration.
Conclusion. There is no role for the drain with thyroid surgery, and thyroidectomies can be considered a day case surgery.

Keywords: thyroid, drain, surgery

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Роль дренажа в хирургии щитовидной железы

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Введение. Использование дренажей при операциях на щитовидной железе (ЩЖ) давно является предметом дискуссий, при этом возможные преимущества, связанные с предотвращением осложнений после хирургического вмешательства, сопоставляются с рисками и дискомфортом, которые они могут вызвать. Мы изучили не только то, что является эффективным с медицинской точки зрения, но и то, что на самом деле способствует выздоровлению и хорошему самочувствию пациента.
Цель исследования – оценить эффективность дренирования при операциях по удалению ЩЖ.
Материалы и методы. Ретроспективное исследование проводилось в течение 4 лет и включало 148 пациентов, которым выполнена операция на ЩЖ без использования дренажа. Ультразвуковое исследование проведено до хирургического вмешательства для классификации патологий ЩЖ и определения ее размеров, а также после него для оценки состояния пациентов. Анализировали сроки пребывания в стационаре, послеоперационные осложнения, связанные с хирургическим дренированием, и способы их устранения.
Результаты. У 8 пациентов был диффузный зоб, у 68 – многоузловой, у 72 – одиночные узлы ЩЖ, которые удалены с помощью различных видов тиреоидэктомий без дренирования (в 25 (16,8 %) случаях проведена субтотальная тиреоидэктомия, в 12 (8,1 %) – тотальная лобэктомия и истмусэктомия, в 111 (75 %) – тотальная тиреоидэктомия). В 94 % случаев в месте операции формирования сером не отмечено; только в 9 случаях выявлено скопление серозной жидкости, которая была удалена путем тонкоигольной аспирации.
Заключение. При операциях на ЩЖ использование дренажа не играет никакой роли.

Ключевые слова: щитовидная железа, головной мозг, хирургия

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Introduction

Surgical drains are ancient tools used with surgical procedures dating back to Hippocrates (460–377 BC), who used a drain to treat empyaema thoracic [1]. Then, the old dictum "when in doubt, drain" remains applicable, and it is still helpful and effective in many situations [2]. Thyroid surgery has, also its depth in the history of surgery, as the first successful record of surgical treatment of goiter was accredited to the Arabic surgeon Abualcaisis in 952 AD, and he used a special bag that was tied to the patient's neck for collection of blood from the site of the operation [3]. Since then, thyroid surgery has evolved greatly, reaching the era of laparoscopy, where endoscopic thyroid surgery is well established and expanding. The thyroid gland is a 20-gram bi-lobed butterfly-shaped endocrine gland at the lower part of the neck. It has a rich blood supply mainly through the superior thyroid, inferior thyroid, and thyroid imam arteries. Thyroid gland is considered as one of the tissue that has the highest blood supply per gram of tissue [4]. It has important functions in regulating metabolic and developmental processes in human beings, and its malfunction may lead to harmful effects on them [5]. Thyroid disorders are common problems in surgical practice, as the prevalence of goitre, for instance, may reach between 9.8 to 51.3 % [6, 7]. In the arab world, the reported prevalence is ranging between 6 to 47 % [8]. Thyroid diseases are usually treated by different modalities of medical and surgical treatments. Various thyroidectomies are designed for different thyroid pathologies; each has its indications, advantages, and disadvantages. A number of complications, that range from trivial to serious complications, may be associated with thyroid surgery. An expanding neck haematoma that may affect respiration is one of these serious complications. Drainage of the highly vascular neck after thyroid surgery is a routine measure and even became a habit by many surgeons to avoid the risks of bleeding, haematoma, and seroma [9]. Taking into the consideration the frequent complications of drains like infection, blockage, kinking, iatrogenic injuries, and the significant discomfort that it causes to the patient; the policy of routine insertion of drains after thyroid surgery needs to be reassessed. In this study, we reported our experience about the importance of drains after thyroid surgery and whether to drain or not.

Aim. To investigate the need for drains in thyroidectomies, with an emphasis on how they affect surgical outcomes overall, patient comfort, and recovery.

Materials and methods

A retrospective study was conducted in Al-Sadar Teaching Hospital in Maysan, Iraq, province from January 2019 to January 2023. In this study, a total of 148 patients who had thyroid operations were enrolled. The patients' ages range from 12 to 80 years, 122 females and 26 males. The clinical history, physical examination, investigations, and operative and post-operative course notes from the hospital records were reviewed.

All thyroid cases that were operated upon without drainage by the author during the above period were included. There were no exclusion criteria. The thyroid surgery includes total thyroidectomy operation, in which no thyroid tissue is left; subtotal thyroidectomy (2x subtotal lobectomy + isthmusectomy), and lobectomy operation (total lobectomy + isthmusectomy). The hospital stay, post-operative complications related to the surgical drainage, and the way of dealing with them for each patient were recorded. The ultrasonic findings were reviewed and used in classifying the morphological pathologies and the sizes of the thyroid gland. According to the ultrasonic measurement, it was considered mild goitre when it is less than double the normal size of the lobe and moderate enlargement when it is more than twice the normal and severe when it is more than the thrice. In addition, the ultrasound examination was used to check for post-operative collections with their sizes. The collection is the term that was used for seroma and haematoma.

The analysis of data was carried out using the available Statistical packages for social science, version 20.0 (SPSS-20.0) with MicroSoft Excel 2010. Data were presented in form of tables. Chi-square test (χ^2-test) was used for testing the significance of association between variable under study. Statistical significance was considered whenever the *p*-value was equal or less than 0.05.

Results

A total of 148 patients that had thyroid surgery by one surgeon (the author) were included in this study. 129 patients out of 148 patients are in young and middle age groups and the demographic distribution of the patients is represented in table 1.

After clinical and ultrasonic assessment, there were 8 patients with diffuse goiter, 68 patients with multinodular goiter and 72 patients with solitary thyroid nodule. The ultrasonic findings of thyroid pathologies and the post-operative collections are represented in table 2.

The types of thyroid surgery that were used in the treatment of the patients are total thyroidectomy, subtotal thyroidectomy, total lobectomy.

All patients were in euthyroid status, and six had recurrent multinodular goiter treated by total thyroidectomy. Two patients developed post-operative operative site

collection. Additionally all 9 (6 %) cases of post-operative surgical site collection were treated by needle aspiration, 2 needed two consecutive aspirations, and only one had been treated by three aspirations with complete resolution. 138 out of 148 patients are managed as a day case surgery and discharged home after an average of 12 hours. Only 10 patients have a hospital stay of 24 hours. There was one case that had wound infection, and there was no mortality.

Table 1. *Demographic distribution of the patients with thyroid pathology*

Age, years	Number of patients, *n*		%	Total
	males	females		
<20	1	6	4.7	7
20–40	8	48	37.8	56
40–60	13	60	49.3	73
>60	4	8	8.2	12
Total	*26*	*122*	*100*	*148*

Discussion

The thyroid operations are a common surgical practice that may be accompanied by significant morbidity [10]. In present study, about 87 % of the cases are in young and middle-aged groups (table 1), as thyroid diseases are common in these age groupIn this series, the ultrasound examination was used in preoperative assessment of the type and size of the goitre, revealing that most of the cases are of solitary thyroid nodule and multinodular goitre (table 2). The ultrasound scan is documented to be more accurate in the assessment of thyroid diseases than physical examination [11]. Furthermore, it is a reliable diagnostic tool for detecting subclinical thyroid lesions (thyroid incidentaloma) [12]. In addition, we used the ultrasonic scan in the post-operative assessment of the patients to detect any post-operative collection (table 2). Different types of thyroidectomies are available in the treatment of different types of goitre; of these are subtotal thyroidectomy, near total thyroidectomy, total lobectomy and isthmusectomy, and total thyroidectomy with its successful modification subscapular total thyroidectomy [13]. In this study, total thyroidectomy was performed for the patients with operable malignant goitre, and the other types of thyroidectomy (subtotal thyroidectomy and total lobectomy) in certain proven benign conditions [14]. In the present series, all operations were performed without drainage.

In most cases (94 %), there was no post-operative wound collection, and we had only 9 out of the 148 cases with a simple collection. All collections were resolved by simple single needle aspiration; only two cases needed two aspirations, and one required three aspirations. So, we think there is no important beneficial role for the drain after thyroid surgery regardless of the size, type of the goitre, or surgical procedure type. Our result agreed with other studies on the unnecessity of drainage with thyroid

Table 2. *Pre and post-op. ultrasonic thyroid scan results*

Types of thyroid pathology	Number of the cases, *n*	Size of the goiter, mm			Number of post-op. collection, *n*	*p*-value (by Chi square test)
		mild	moderate	severe		
Diffuse goiter	8	–	2	6	0	0.0001
Multinodular goiter	68	8	28	32	3	
Solitary thyroid nodule	72	42	30	–	6	
Total	*148*	*50*	*60*	*38*	*9*	

Note. *MNG – multinodular goiter; STN – solitary thyroid nodule.*

Table 3. *Types of thyroid surgery*

Type of operation	Diffuse goitre	MNG	STN	Total	%	Number of cases with collection, *n*	*p*-value (by Chi square test)
Subtotal thyroidectomy	2	23	–	25	16.8	2	0.0001
Total lobectomy	–	–	12	12	8.2	–	
Total thyroidectomy	6	45	60	111	75.0	7	

Note. *MNG – multinodular goiter; STN – solitary thyroid nodule.*

operations. A. Sanabria et al. reviewed 11 comparative clinical trials, and he concluded that there was no significant difference in the incidence of neck collections (seroma or haematoma) between drainage and no-drainage groups after thyroid surgery; furthermore, he reported longer hospital stays with the drainage groups [15]. The same result was recorded by O. Wihlborg et al.; they wrote in their study that "No difference was seen between the drainage and no drainage groups according to the experience of the surgeon, type of operation, diagnosis, weight of thyroid specimens, operation time, and hospital stay" [16]. A.R. Shaha et al., in their series, recommended selective use of drains in thyroid surgery for large retrosternal goitre and after subtotal thyroidectomy for large multinodular goitre and Grave's disease However, he reported no significant differences between drainage and no drainage groups [17]. L.M. Hurtado-López et al. also reached to the same result, they reported that "the size of the gland, diagnosis, type of surgery, trans-operative bleeding, and complications are not valid arguments for leaving an external drain in thyroid surgery", and neither the type of drain is of any advantage in reducing the complications after the thyroid surgery [18].

Moreover, N. Suslu et al. reported similar results and recommended the abandonment of routine drains after uncomplicated thyroid operations [19]. Regarding hospital stay, we dealt with all of our patients as day case surgery, and they were discharged home in less than 24 hours. N. Suslu et al. reported an average of 2.6 hospital stay days for the drainage group and 1.3 days for no-drainage one. From the results of our study, two out of four patients with recurrent goitre had developed wound collection that was treated successfully by needle aspiration. One of our patients had developed a simple wound infection, which is considered within the expected limit of the wound infection rate of clean operation [20, 21].

Conclusion

Thyroid surgery can be undertaken safely without drainage of the operation site. There are few patients that may develop neck collection and this can be dealt with effectively with percutaneous needle aspiration. We stress about taking special care and meticulous haemostasis in cases of recurrent goitre as extensive adhesions are expected. Thyroid surgery can be performed as a day case surgery.

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