

# Drainage in Thyroid and Parathyroid Surgery

Jesús Herranz and Juan Latorre

Servicio de Otorrinolaringología, Hospital Santa Teresa-Grupo USP, A Coruña, España.

**Objective:** The use of suction drains in thyroid and parathyroid surgery is common practice in order to avoid haematoma or seroma, as well as to identify promptly the onset of haemorrhaging that might compromise the patient's airway. The goal of this study is to evaluate the experience on 79 thyroid and parathyroid procedures, in 50 % of which a drain was used.

**Results:** No differences were found in terms of the presence of infections, seromas, or haemorrhage. Post-operative haemorrhage was found in 2.3 % of cases, haematoma in 2.5 %, and seroma in 1.2 %. The mean hospital stay was longer in patients with drains, 1.8 days, than in patients without, 1.2 days.

**Conclusions:** Meticulous haemostasis and adequate surgical technique are the key for avoiding haemorrhage and haematoma formation. Extensive dead space, intrathoracic or retrosternal goiters, and excessive tissue manipulation are our indications for suction drain placement.

**Key words:** Thyroidectomy. Complications. Haemorrhage.

## Drenajes en cirugía de tiroides y paratiroides

**Objetivo:** El empleo de drenajes tras la cirugía de tiroides y paratiroides busca evitar hematomas o seromas e identificar con prontitud la aparición de hemorragias que pudieran comprometer la vía aérea del paciente. Su empleo se asume como una medida habitual. El objetivo de este estudio es describir la experiencia obtenida en 79 cirugías de tiroides y paratiroides, en el 50 % de las cuales se ha utilizado drenaje.

**Resultados:** No hemos encontrado diferencia en cuanto a infecciones, seromas o hemorragias. Tuvimos un 2,3 % de hemorragias postoperatorias, un 2,5 % de hematomas y un 1,2 % de seromas. La estancia media fue mayor en los pacientes con drenaje, 1,8 días, que sin drenaje, 1,2 días.

**Conclusiones:** Una correcta técnica quirúrgica y la meticulosa hemostasia evitan la aparición de hemorragias y hematomas. La presencia de amplios espacios muertos, los bocios intratorácicos o retroesternales y la manipulación excesiva de los tejidos son nuestras indicaciones para la colocación de drenajes.

**Palabras clave:** Tiroidectomía. Complicaciones. Hemorragia.

## INTRODUCTION

The systematic use of drains in thyroid and parathyroid surgery is rarely the subject of comment<sup>1</sup>. Instead, they are generally used as a matter of the surgeon's habit or preference more than as a matter of proven benefit in the patient's post-operative period. Whereas for some, it is an element that increases the patient's discomfort and post-operative hospital stay<sup>2</sup>, for others, the discomfort is minimal and the drain offers important benefits<sup>3</sup>. The type of drain to be placed, semi-rigid with continuous suction or a Penrose type, is also a matter of discussion and neither type offers more benefits than the other<sup>4</sup>.

The goal of the present paper is to analyze the post-operative complications and stays in patients who have undergone cervical surgical approaches for thyroid and/or

parathyroid disease, as they relate to the use or non-use of post-operative drains.

## MATERIAL AND METHOD

We have conducted a descriptive, retrospective, non-randomized study of the post-operative evolution of 79 cervicotomies effected in 75 patients who underwent surgery over a 4-year period by the same surgical team. The decision to place a drain or not depends on the surgeon's opinion regarding the resulting dead space or how the surgery has progressed in terms of tissue handling or bleeding, which is why a randomized study has not been carried out.

Given that the surgical approach used is the same, no stratification has been made on the basis of thyroidectomy, hemi-thyroidectomy or parathyroidectomy. A semi-rigid, 4.2 mm external diameter drain was used (Emodren Ref: TD12/42. Medicalplastic s.r.l., Milan, Italy) together with a Drainobag Lock 600 V or 150 V of B/Braun suction reservoir. The drain was removed by means of an incision that was independent of the cervicotomy incision and was placed in the surgical bed, medially and posteriorly to the previous one.

Correspondence: Dr. J. Herranz.  
Rua Courel, 6. 15179 Oleiros. A Coruña. España.  
E-mail: jhg@canalejo.org

Received February 27, 2006.

Accepted for publication October, 2006.

None of the patients underwent any kind of treatment that would increase bleeding.

The presence of oedema, change of voice, tetanus or paraesthesia in the post-operative period was recorded. The hospital stay was defined as the time elapsed between when the patient was admitted and when he/she was discharged. The drain was kept in place for more than 24 h when more than 50 ml were collected.

## RESULTS

Seventy-nine surgical interventions in 75 patients were analyzed; mean patient age was 48 years (range, 75-25 years), and 74.6% (56/75) were female and 25.4% (19/75) were male. Fifty hemithyroidectomies and 29 total thyroidectomies were performed. The resulting pathology is presented in Table 1. Drains were placed in 50.6% (40/79) of the interventions. The type of surgery and whether pre-thyroid musculature at the infrahyoid level was incised or not is shown in Table 2.

The mean hospital stay for patients who underwent a semi-thyroidectomy without drain placement was 1.15 days versus 1.75 days for patients in whom a drain had been placed. For total thyroidectomies, mean hospital stay was 1.5 days, versus 1.86 days. There were 2 (2.5%) post-operative haemorrhages requiring surgical revision. Both cases were arterial bleeding following hemi-thyroidectomy and a drain had been placed. The alerting symptom was the sudden increase in neck volume with vomiting. Two haematomas and one seroma were identified as requiring surgical draining

and the placement of a Penrose drain for 48 h. A drain had been placed in all 3 cases and in one case, a functional voiding and total thyroidectomy had been performed due to papillary carcinoma with node metastasis. One female patient presented intolerance to the Vycril sutures and a keloid and several abscesses developed over the course of 2 years.

No significant differences were found in the complication rate with respect to whether or not the pre-thyroid musculature had been incised.

Recurrent paralysis was identified in 3 patients (3.8%), which was temporary in 2 patients and permanent in 1 (1.2 %). It was not possible to identify the recurrent nerve in the latter case. One of the temporary paralyses involved both recurrent nerves. The patient presented dyspnoea on making medium effort and recovered mobility of both chords 17 days following surgery.

One female patient presented temporary hypocalcaemia from which she recovered 7 weeks later.

## DISCUSSION

We are aware of the fact that the results of this work are not corroborated by scientific evidence underpinned by a statistical study of a randomized sample; therefore, they are opinions formed on the basis of personal experience. In this experience, the use of drains seeks to identify haemorrhages and to prevent haematomas or seromas so as to reduce the risks of infection. However, the fundamental risk a patient undergoing any kind of cervical surgery is subject to is compromise of the airways. The neck is not a very distensible structure and contains important vascular structures and the trachea. Arterial bleeding near the trachea leads to decreased space that compresses the airway and produces significant oedema in the soft tissues of the larynx and the pharynx. All of this leads to the syndrome known as the "suffocating haematoma", which requires immediate treatment and surgical revision in the operating theatre. This complication appears very infrequently, with figures ranging from 0.3 to 2.5%<sup>5-8</sup>; however, when it does appear, it is an important challenge for both the surgeon as well as the anaesthesiologist. The risk is greater in patients with intrathoracic goitre and patients with Graves-Basedow disease. It has also been associated with the administration of anticoagulants or coagulation alterations. It tends to appear between 2 and 6 h after surgery. Most patients report coughing, vomiting or nausea prior to the haemorrhage. In our series of cases, both patients presented vomiting. Possible causes include the displacement of an improperly applied suture, the opening of a vessel that had been coagulated using diathermia or "drooling" of an area that has been improperly cauterized. In our case series, the bleeding vessel corresponded to one of the branches of the inferior thyroid. When attempting to ligate the inferior thyroid as close as possible to the gland, in order to conserve the vascularization of the parathyroid, the dissection of these small vessels may cause a spasm that hides the haemorrhage, which is then revealed when the arterial pressure increases as the patient recovers from the anaesthesia or in the case of coughing or

**Table 1.** Pathology of the Surgical Piece

Type	N	%
Multinodular hyperplasia	57	72.2
Papillary carcinoma	8	10.2
Parathyroid adenoma	5	6.4
Follicular adenoma	3	3.8
Graves-Basedow	2	2.5
Thyroiditis	2	2.5
Follicular carcinoma	1	1.2
Hürthle cell adenoma	1	1.2

**Table 2.** Drain Placement According to Type of Surgery

Parameter	Drains	
	Yes	No
Resection		
Total thyroidectomy	23	6
Hemi-thyroidectomy	16	34
Muscle incision		
Yes	22	16
No	17	24

vomiting during the immediate post-operative period. In addition to prolonging the hospital stay, surgical revision entails greater morbidity.

Surgical drains neither prevent this complication from occurring nor do they contribute to early detection. In fact, haemorrhage can appear and the container may be empty because the blood has clotted inside the drain. Bandages do not reduce the risk of haemorrhage either. They keep blood from collecting in the subcutaneous plane, but the blood may dissect the deep plane to the prethyroid musculature, in the paratracheal region, compressing the airway at that level.

In a comprehensive review carried out by Sánchez-Blanco<sup>1</sup>, one of the elements analyzed is the "peace of mind" the surgeon has by placing the drain. None of the series analyzed, that include placing Surgicel strips or the use of fibrin glue, achieved a significant decrease in the rate of haemorrhage-related complications, haematomas or seromas; nor has a higher incidence of local infections been detected as a result of not using drains.

On the other hand, the use of a drain entails additional aggression for the patient, both due to the scar it causes, as well as the discomfort involved when it is removed. Furthermore, drain placement is associated with a longer hospital stay in most series<sup>1-3,9</sup>.

## CONCLUSIONS

The critical revision of one's own experience is a core element in progress and is the basis for this study. In our experience, the use of drains in thyroid and parathyroid surgery is not a systematic procedure. Its use is associated

with extensive dead spaces, particularly when there is retrosternal or intrathoracic extension, when the patient is on anticoagulant treatment or if there has been excessive tissue manipulation. There is no element that can substitute meticulous surgical technique, with comprehensive check of haemostasis at the end of the intervention. This revision should include increasing abdominal pressure by means of pulmonary hyperinsufflation, in order to identify possible venous or arterial openings that may have collapsed. Close control and patient monitoring during the immediate post-operative period (6-8 h) are critical in identifying the presence of bleeding. The lack of cervical bandaging and incomplete suturing of the midline, at the inferior level of the prethyroid musculature are elements that can aid in identifying the presence of bleeding more promptly.

## REFERENCES

1. Sánchez Blanco JM. Uso de drenajes en cirugía tiroidea y paratiroidea. *Cir Esp*. 2004;75:319-25.
2. Schoretzanitis G, Melissas J, Sanidas E. Does draining the neck affect morbidity following thyroid surgery? *Am Surg*. 1998;64:778-80.
3. Debry C, Renou G, Fingerhut A. Drainage after thyroid surgery: a prospective randomized study. *J Laryngol Otol*. 1999;113:49-51.
4. Willy C, Steinbronn S, Sterk J, Gerngross H, Schwarz W. Drainage systems in thyroid surgery: a randomised trial of passive and suction drainage. *Eur J Surg*. 1998;164:935-40.
5. Lacoste L, Gineste D, Karayan J. Airway complications in thyroid surgery. *Ann Otol Rhinol Laryngol*. 1993;102:441-6.
6. Shaha AR, Jaffe BM. Practical management of post-thyroidectomy hematoma. *J Surg Oncol*. 1994;57:235-8.
7. Burkey SH, Van Heerden JA, Thompson GB, Grant CS, Schleck CD, Farley DR. Reexploration for symptomatic hematomas after cervical exploration. *Surgery*. 2001;130:914-20.
8. Agrawal A, Mishra S. Post-thyroidectomy haemorrhage. An analysis of critical factors in successful management. *J Indian Med Assoc*. 1997;95:418-9.
9. Hurtado-López LM, López-Romero S, Rizzo-Fuentes C, Zaldivar-Ramírez FR, Cervantes-Sánchez C. Selective use of drains in thyroid surgery. *Head Neck*. 2001;23:189-93.