



# Current Medical Imaging

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## CASE REPORT

# Spontaneous Thyroid Parenchymal Hemorrhage Causing Acute Airway Obstruction and Its Endovascular Treatment: A Case Report and Literature Review

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### Abstract:

#### Introduction:

Massive parenchymal hemorrhage of the thyroid gland is very rare. Some of these can reach a life-threatening level.

#### Case Presentation:

A 70-year-old female patient approached the emergency department with swelling and redness on her neck after a routine dialysis session. In the neck computed tomography obtained, there was a massive hematoma originating from the thyroid gland parenchyma. The hematoma was causing airway compression. We performed thyroid artery embolization and within days, hematoma dimensions and compression effect disappeared without surgical treatment.

#### Conclusion:

Massive hemorrhage of the thyroid gland parenchyma is very rare and can reach life-threatening dimensions. Effective and rapid treatment should be done. As an alternative to surgery, endovascular treatment can be life-saving.

**Keywords:** Thyroid parenchymal hemorrhage, Hematoma dimensions, Endovascular, Gland, Surgical treatment, Patient.

### Article History

Received: October 07, 2022

Revised: January 24, 2023

Accepted: February 02, 2023

## 1. INTRODUCTION

Although the thyroid gland is one of the organs with an excessive blood supply, massive parenchymal hemorrhage is very rare [1]. Parenchymal thyroid hemorrhage, which may be due to traumatic and non-traumatic causes, may present with a wide clinical picture ranging from asymptomatic patients to life-threatening serious clinical conditions. Very few cases of life-threatening spontaneous parenchymal hemorrhage have been reported in the literature [2 - 4].

In this case, we aimed to present the endovascular treatment of a patient with life-threatening thyroid parenchymal hemorrhage.

## 2. CASE REPORT

A 70-year-old patient with known chronic kidney disease approached the emergency service after a sudden onset of pain

and swelling on the right side of the neck after a routine dialysis session (with heparin). The patient had no comorbidities and was not on routine antiaggregant or anticoagulant medication.

In neck computed tomography angiography (CTA), a large hematoma was observed, which is associated with the thyroid gland, compressing both internal jugular veins and narrowing the trachea. There was active extravasation within the hematoma (Fig. 1).

The patient developed shortness of breath within minutes and it progressed rapidly. Therefore, the patient was intubated to ensure airway safety. First, decompression surgery was recommended, but the patient's relatives did not accept it. We decided to perform thyroid artery embolization. Bilateral thyrocervical trunks and bilateral lower and upper thyroidal arteries (TA) were super selectively catheterized and images were taken. No active extravasation was observed in the images obtained. Embolization of the right inferior thyroid

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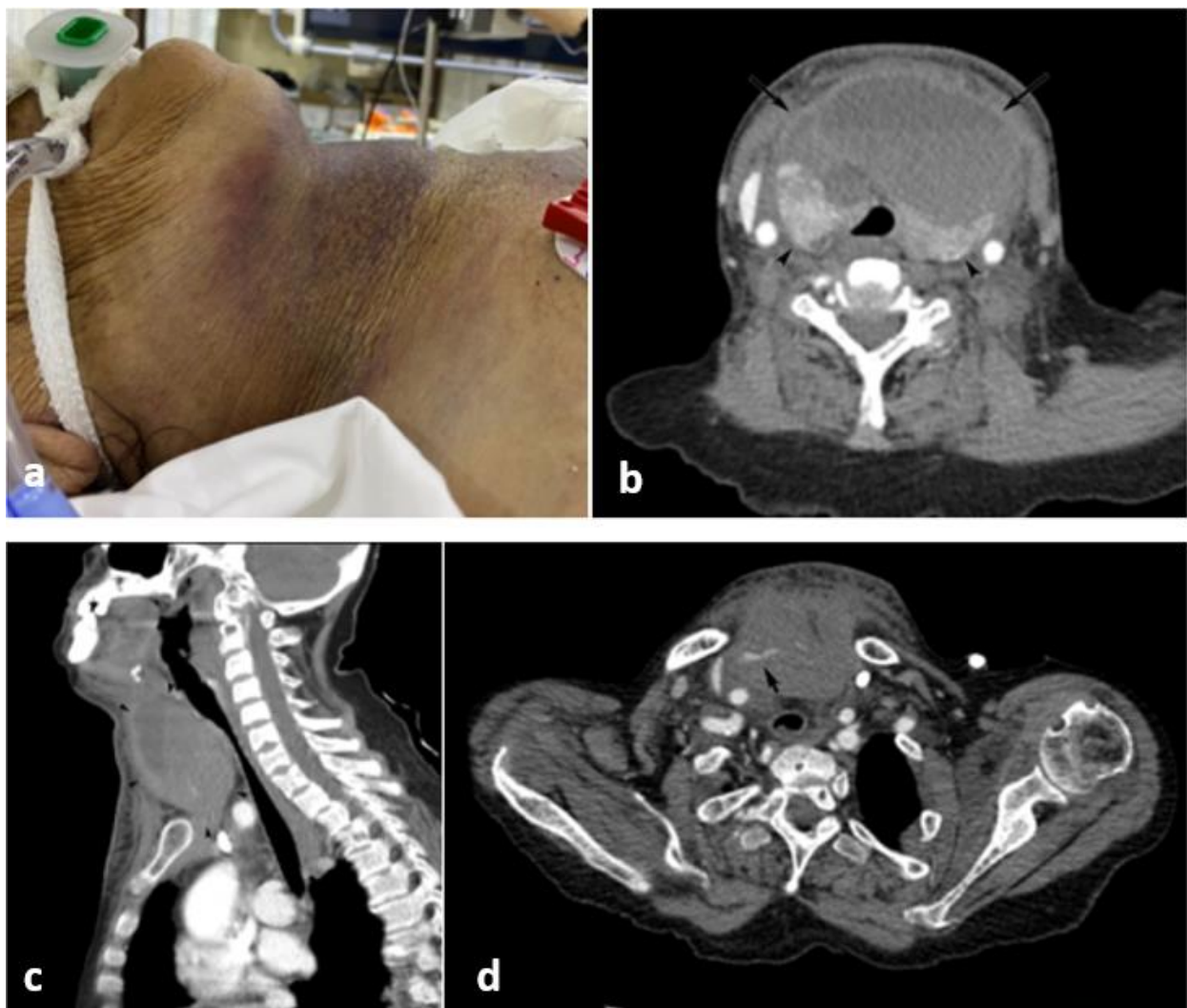
artery (ITA) was performed as there was extravasation at the inferior level of the right thyroid lobe on CTA. Superselective embolization was achieved by using a mixture of 1 part N-butyl cyanoacrylate (glue) and 2 part lipiodol (1/3 glue/lipiodol ratio) for embolization (Fig. 2).

Thyroid function tests taken after treatment showed normal ranges. On CT obtained 4 days and 8 days later, hematoma size and airway compression decreased (Fig. 3). The patient was intubated for 12 days. There was no thromboembolic event during this period. She was hospitalized for a total of 15 days. Ultrasonography (USG) was performed 3 months after discharge, the hematoma was completely resolved and the thyroid gland appeared normal (Fig. 4).

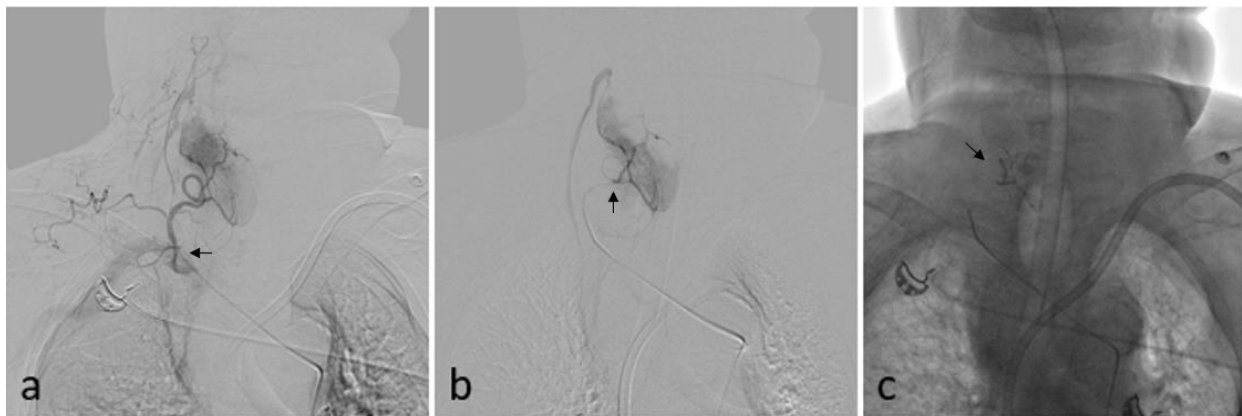
### 3. DISCUSSION

Despite the intense vascularization of the thyroid gland, severe bleeding is very rare. Blunt trauma is the etiological factor responsible for most thyroid parenchymal hemorrhages. However, it has been reported that it can be seen with conditions that increase venous pressure, such as the Valsalva maneuver, chronic constipation, and cough [5]. The use of anticoagulants is another important etiological factor [6].

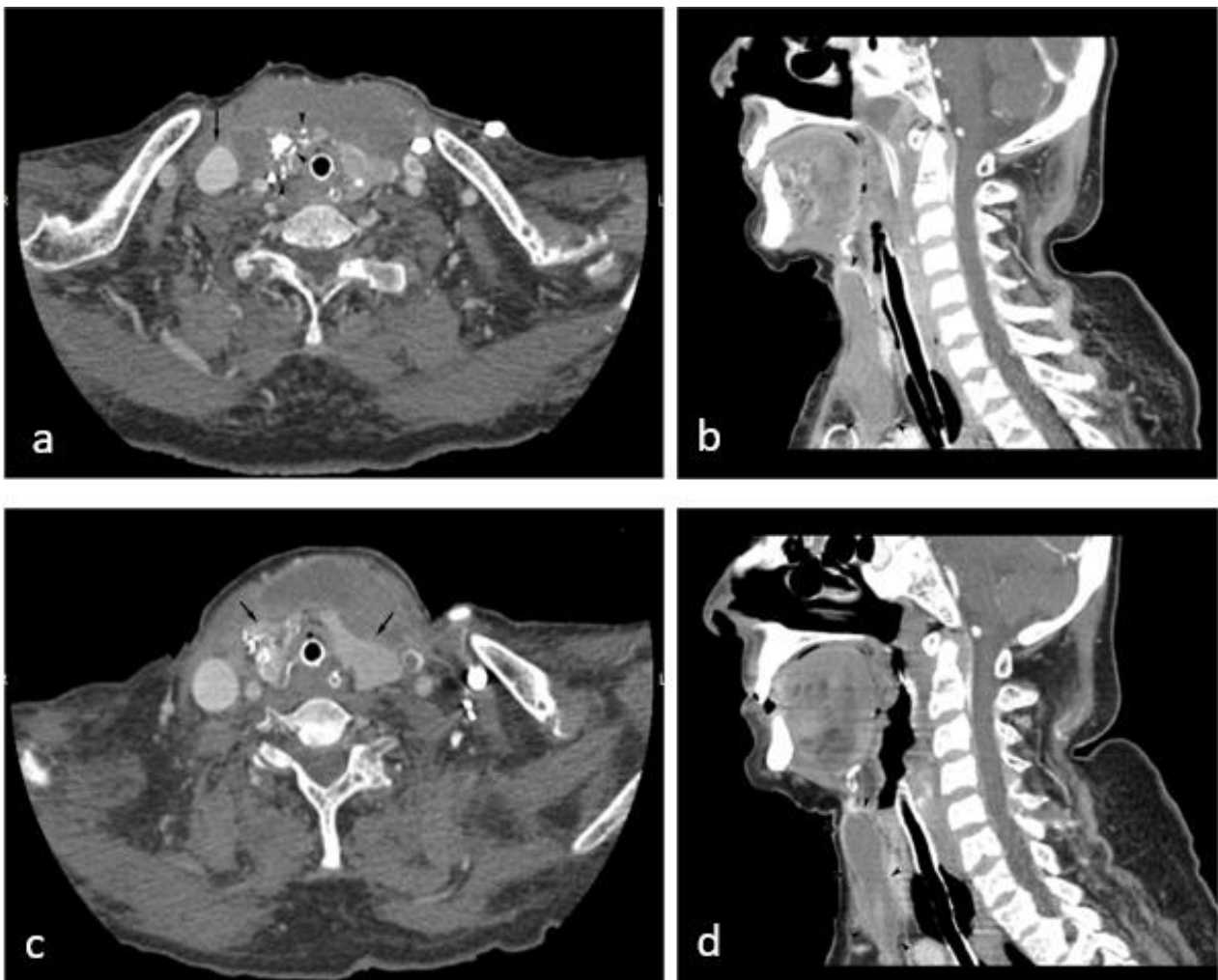
A few cases of massive thyroid parenchymal hemorrhage without a history of trauma have been reported in the literature. These are summarized in Table 1.



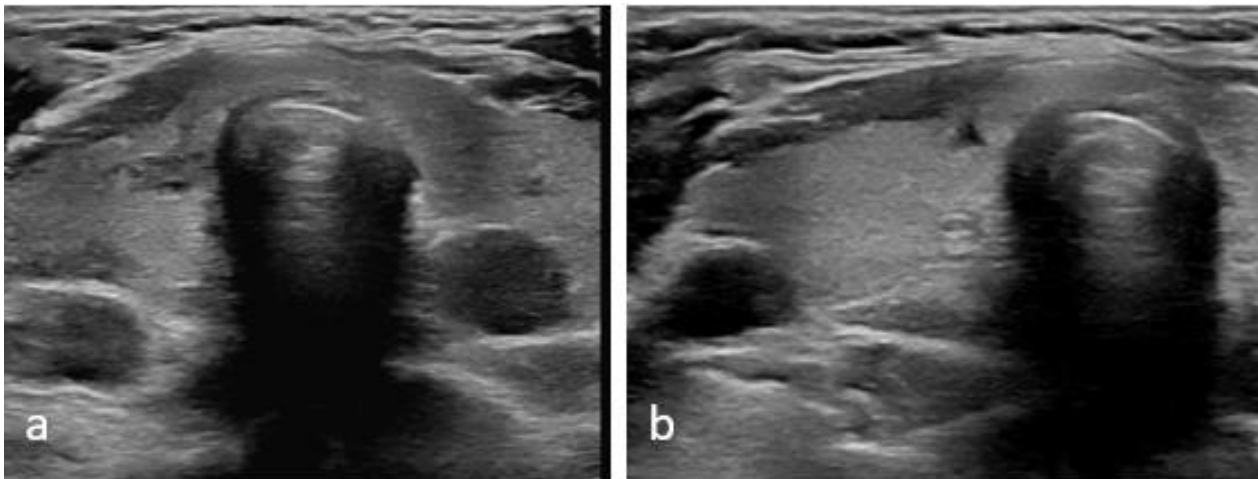
**Fig. (1).** (a). Widespread swelling and ecchymosis in the neck (b). A large hematoma (arrowhead) anterior to the thyroid gland (arrow), The trachea, and both internal jugular veins appear compressed (c). Large hematoma (arrowheads) and tracheal compression. (d). Active extravasation on CTA (arrow).



**Fig. (2).** (a). Thyrocervical trunk selective catheterization (arrow) (b). Inferior thyroidal artery super-selective catheterization (arrow) (c). Image after inferior thyroid artery embolization (arrow).



**Fig. (3).** (a). After 4 days, the hematoma decreased in size. The compression of the right internal jugular vein (arrow) decreases, the glue material (arrowhead) (b). The hematoma decreases in size after 4 days (c,d). After 8 days, the size continues to decrease. Both thyroid lobes (arrow) appear normal.



**Fig. (4).** (a). After 3 months, Thyroid USG, hematoma completely resolved. (b). The right thyroid lobe appears normal.

**Table 1. Summary of patients with massive thyroid parenchymal hemorrhage without trauma published in the literature.**

Reference	Age	Etiology	Intubation	Treatment
Best 2016 [1]	33	Unknown	Yes	Surgery/hemithyroidectomy
Matilde 2022 [2]	75	Unknown	No	Surgery
Basak 2022 [3]	57	Nodule	Yes	Surgery/hemithyroidectomy
Kokatnur 2014 [4]	73	Anticoagulant	Yes	Surgery
Wong 2019 [5]	68	Unknown	Yes	Conservative
Marta Pérez 2014 [6]	44	Nodule	No	Conservative
Asbar 2019 [7]	80	Anticoagulant	No	Conservative
Fernando 2018 [8]	97	Anticoagulant	No	Conservative
Hristov 2016 [9]	36	Nodule	No	Surgery
Tsilchorozidou 2006 [10]	80	Anticoagulant	No	Conservative
Petersen 2021 [11]	80	Nodule	Yes	Surgery/hemithyroidectomy
Gunasekaran 2017 [12]	91	Anticoagulant	Yes	Conservative

Although most of the bleeding is self-limited clinically, airway obstruction has developed to the extent that intubation is required in a few reported cases [7]. The best method for diagnosis is CT, which determines the hematoma borders well and shows airway compression [8].

In the treatment, primarily surgical methods are chosen. However, we think that endovascular treatment is effective in patients who cannot undergo surgical treatment [9]. As far as we know, our patient is the first patient in the literature who had a massive thyroid parenchymal hemorrhage, without trauma, and was treated with thyroid arterial embolization.

## CONCLUSION

In massive thyroid parenchymal hemorrhages, endovascular treatment may be an option besides surgical treatment.

## LIST OF ABBREVIATIONS

CT	=	Computed Tomography
CTA	=	Computed Tomography Angiography
TA	=	Thyroidal Arteries

ITA = Inferior Thyroid Artery

USG = Ultrasonography

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

## HUMAN AND ANIMAL RIGHTS

Not applicable.

## CONSENT FOR PUBLICATION

Informed consent was obtained from the patient.

## STANDARDS OF REPORTING

CARE guidelines were followed.

## AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

**FUNDING**

None.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest financial or otherwise.

**ACKNOWLEDGEMENTS**

Declared none.

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