

## **Surgery for retrosternal goiter inducing superior vena cava syndrome and heart failure**

**Dieng PA, Ba PS, Gandji W, Diatta S, Gaye M, Diop MS, Sow NF, Diagne PA, Fall ML, Ciss AG, Ndiaye A, Ndiaye M**

Cardiovascular Center at Fann University Hospital, BP5035 Dakar, Senegal

### **\*Corresponding author**

Dr Papa Adama Dieng

**Email:** : [padiengsala@yahoo.fr](mailto:padiengsala@yahoo.fr)

---

**Abstract:** The currently accepted definition of an intrathoracic goiter is a thyroid gland with more than 50% of its mass located below the thoracic inlet. This is a rare case of giant retrosternal goiter with also compression of great arteries and cardiac cavities induced heart failure syndrome. A 60 years old woman admitted for superior vena cava syndrome (SVC) with dyspnea, plethoric and puffy neck and face. These symptoms were present for 5 years. She experienced 3 months ago congestive heart failure. Imaging confirmed the development of giant retrosternal goiter, mostly developed from the right lobe in the anterior mediastinum, with vascular compression (superior vena cava, aorta, pulmonary artery), and heart compression (right ventricle). Resection of the thoracic portion was done from the pericardium and pleurae, and then with 1.5 cm median cervical extension, the total excision of the 1400 gr goiter was done. Post-operative period was eventless. Surgical removal of retrosternal goiter is a safe procedure. It permitted relief of symptoms such as SVC syndrome and heart failure symptoms. It should be noticed that the benign thoracic goiter is treatable cause of the SVC syndrome.

**Keywords:** retrosternal goiter, superior vena cava syndrome, heart failure, surgery.

---

### **INTRODUCTION:**

The currently accepted definition of an intrathoracic goiter is a thyroid gland with more than 50% of its mass located below the thoracic inlet [1, 2]. The intrathoracic thyroid adenoma or goiter is mostly located in the anterior mediastinum. This leads mostly to compression of superior vena cava. This is a rare case of giant cervicothoracic goiter with also compression of great arteries and cardiac cavities induced heart failure syndrome.

### **CASE PRESENTATION**

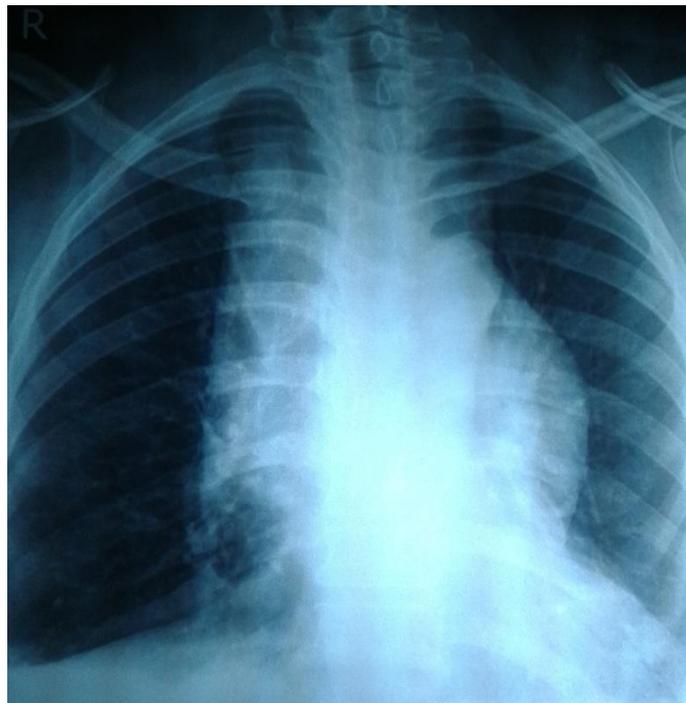
This is a case of 60 year's old woman admitted for superior vena cava syndrome (SVC) with dyspnea, plethoric and puffy neck and face. These symptoms were present for 5 years. She experienced 3 months ago congestive heart failure, which decreased with diuretic administration. Physical examination showed edema of the face, neck and upper side of the chest with collateral venous circulation (figure 1). A cervical goiter was palpated. Blood tests showed hyperthyroidism. An anterior mediastinal mass was found on thoracic X-ray as well bilateral pleural effusion (figure 2). Cardiac

ultrasound showed a compression of right ventricle, pulmonary infundibulum, and superior vena cava.

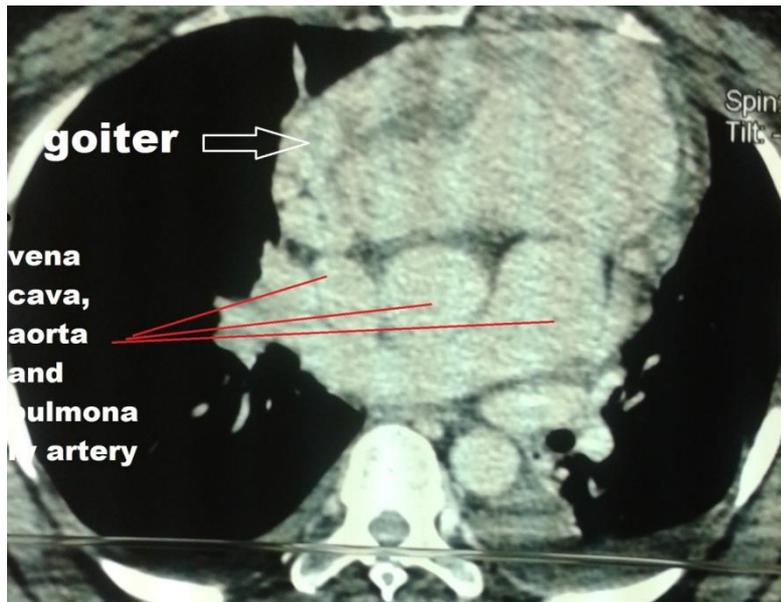
CT scanner confirmed the development of giant cervical and retrosternal goiter (figures 3, 4), mostly developed from the right lobe in the anterior mediastinum, with vascular compression (superior vena cava, aorta, pulmonary artery), and heart compression (right ventricle). The left cardiac cavities were dilated. The diagnosis of cervicothoracic goiter with compression inducing vena cava syndrome and heart failure was retained. The patient underwent surgery. The first step was a sternotomy which showed a retrosternal goiter of 18x16x7.5 cm (figure 5) with compression of the vena cava, the aorta, the pulmonary artery and the right ventricle (figure 6). Dissection of the thoracic portion was done from the pericardium and pleurae, and then with 1.5 cm median cervical extension, the total excision of the 1400 gr goiter was done (figure 7), with superior parathyroid glands and both recurrent nerves seen and left in place. Right away edema and veins enlargement decreased (figure 8).



**Fig- 1: Congestive signs of SVC and heart failure with puffiness of neck and upper thorax, and superficial veins enlargement**



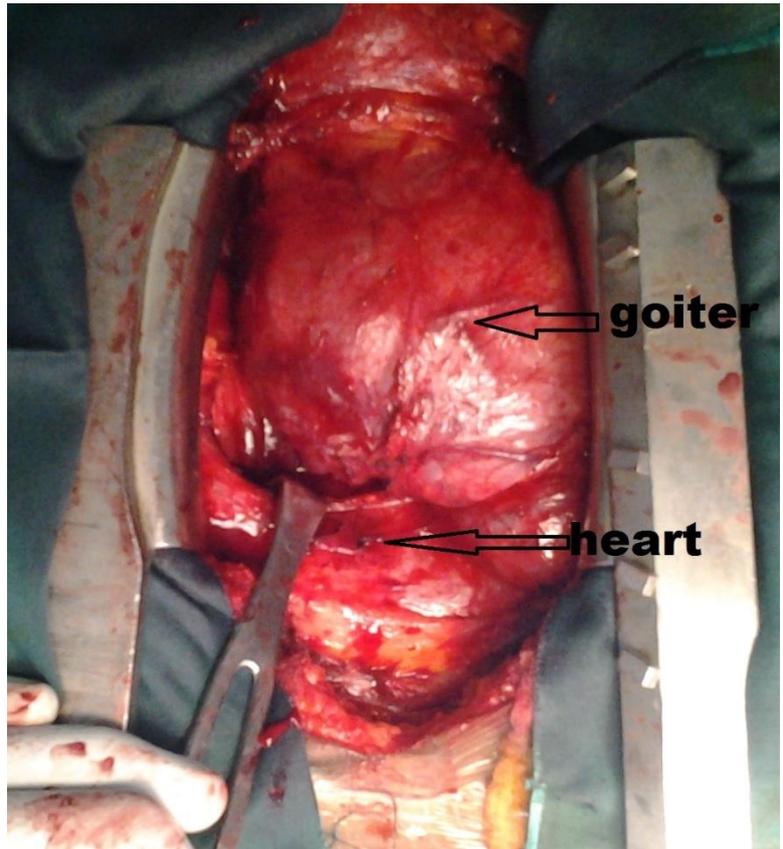
**Fig- 2: X-ray image of enlargement of the mediastinum due to the cervico-thoracic mass**



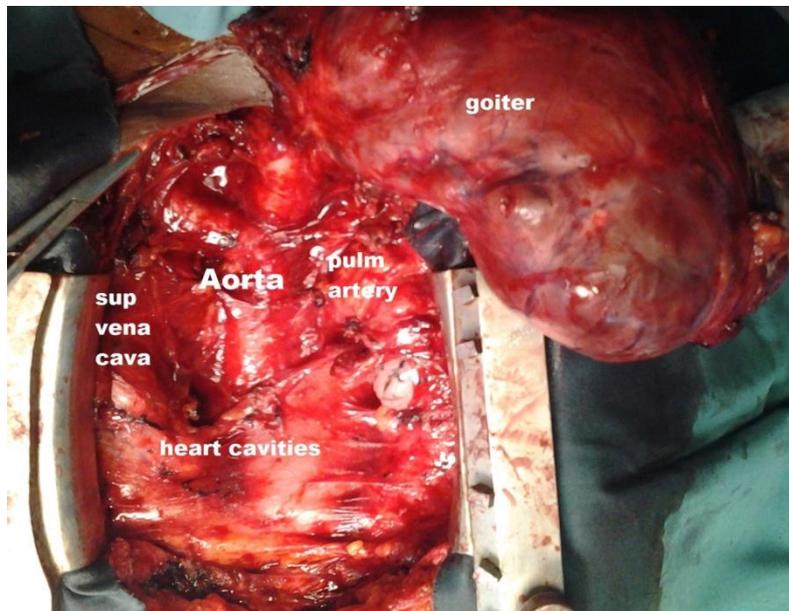
**Fig- 3: CT scan image of retrosternal goiter laying down to thoracic greats vessels**



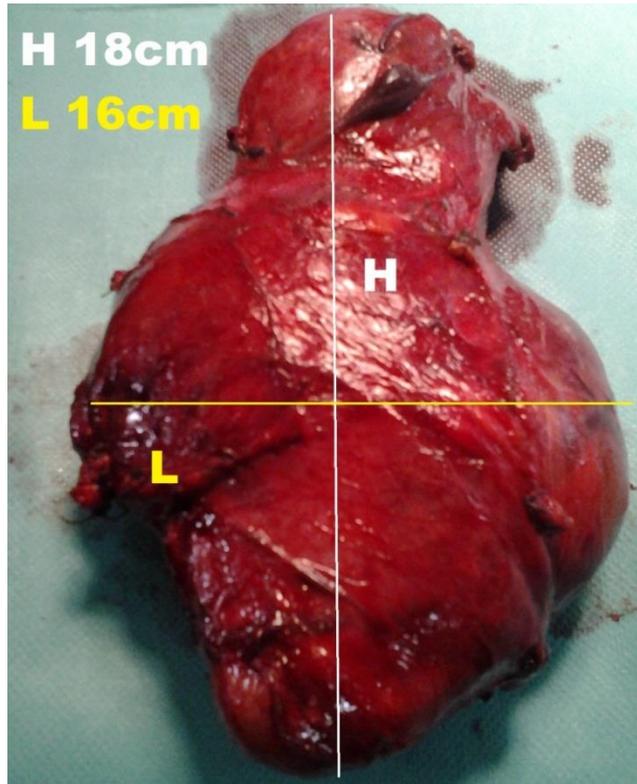
**Fig-4: CT scan image of the thoracic goiter compressing the heart**



**Fig-5: Operative view of thoracic goiter on top of the heart after sternotomy access**



**Fig- 6: Operative view of removal of the goiter leaving print on heart and vessels**



**Fig-7: Image of the giant cervicothoracic goiter after extra-capsular resection**



**Fig- 8: Image of closed sternotomy showing decrease of edema and superficial veins dilatation**

---

Post-operative period was eventless. After this total thyroidectomy, routine short-term treatment with calcium (1 gr daily orally) was administered and levothyroxin (100 µgr daily orally). Cytopathology examination diagnosed thyroid adenoma.

#### DISCUSSION:

Thoracic goiter is often asymptomatic for several years before compressive signs. In this case SVC syndrome and heart failure appear after 5 years of evolution. Acute symptoms are often related to intraglandular hemorrhage or venous thrombosis. Intrathoracic goiters may cause more severe compressive symptoms than the cervical goiters, due to the limited space of the thoracic inlet [3, 4]. At first, the tumor will grow into the anterior superior mediastinum between trachea and sternum, forming the common retrosternal thyroid goiter and could induce shortness of breath. The intrathoracic thyroid adenoma or goiter is mostly located in the anterior mediastinum [5]. Compression of trachea, esophagus, vascular and neural structures may cause dyspnea, dysphagia, SVC syndrome, deep venous thrombosis, hoarseness, and Horner's syndrome.

This case belongs to non-malignant cause of SVC; most of the etiologies are malignant [6, 7]. Obstruction of the superior vena cava is uncommon, with rare description in the literature. However heart compression with heart failure syndrome hasn't so far described. The gigantism of this goiter with a weight of 1400 gr, affected the pulmonary infundibulum and cardiac cavities, with failure of cardiac function.

The presence of compressive symptoms is an indication for resection of both cervical and intrathoracic goiters. The size and location of the goiter will determine the options for surgical approach which include thoracoscopy, thoracotomy or sternotomy. Most of retrosternal goiters can be removed using cervicotomy access.

More invasive sternotomy can be performed for complicated cases as this one, in which the goiter cannot be removed by any other access [8]. Total thyroidectomy was performed through a median sternotomy extended with a 1.5 cm median cervical incision. Surgical removal of retrosternal goiter is a safe procedure. It permitted relief of symptoms such as SVC syndrome and heart failure symptoms, right away with decrease of edema and veins enlargement (figure). The intrathoracic goiter is more often benign [9]. Thyroid adenoma is frequently described in cytopathology. Based on the presented case and the literature, it should be noticed that the benign thoracic goiter is treatable cause of the SVC syndrome.

#### CONCLUSION:

Thoracic goiter is a benign cause of superior vena cava syndrome. More less it induce heart and vascular compression with heart failure syndrome. Compressive signs are indication of surgery. Surgery for thoracic goiter is safe and allows immediate release of symptoms.

#### REFERENCES

1. Desouza FM, Smith PE; Retrosternal goiter. *J Otolaryngol*1983; 12:393-6.
2. Netterville JL, Coleman SC, Smith JC; Management of substernal goiter. *Laryngoscope*1998; 108:1611-7.
3. Katlic MR, Wang CA, Grillo HC; Substernal goiter. *Ann Thorac Surg* 1985; 39:391-9.
4. Singh B, Lucente FE, Shaha AR; Substernal goiter: a clinical review. *Am J Otolaryngol*1994; 15:409-16.
5. Xin Chen, Hongfei Xu, Yiming Ni, Ke Sun, Weidong Li; Complete excision of a giant thyroid goiter in posterior mediastinum *Journal of Cardiothoracic Surgery* 2013, 8:207.
6. M.Makeieff, F. Marlier, M.Khudjadze ; Les goitres plongeants. A propos de 212 cas. *Ann Chir* 2000 ; 125 :18-25.
7. Riquet M, Deneuille M, Debesse B, Chretien J; Goitre endothoracique autonome. A propos de 2 nouveaux cas. *Rev. Pneumo. Clin.* 1986, 42 : 267-273.
8. Pia PA, Kevin HJ; *canchir*, 2008; 51 (5): 110-112.
9. Kosmas T, Aikaterini NV, Paul Z, Elias K; Resection of a giant bilateral retro vascular intrathoracic goiter causing severe upper airway obstruction, 2 years after subtotal thyroidectomy: a case report and review of the literature. *JThorac Dis* 2012; 4(S1):41-48.