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CASE REPORT

Uniportal Video-Assisted Thoracoscopic Surgical Resection of Intrathoracic Goitre: The First Report in Nigeria

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Summary

A goitre is an abnormal enlargement of the thyroid gland which may be amenable to surgical removal. Video-assisted thoracic surgery (VATS) is a minimal access surgery which can be used for thyroidectomy with the advantage of less morbidities compared to thoracotomy or sternotomy. Depending on the number of ports used, VATS can be 4-ports, 3-ports, 2-ports or uniportal. Uniportal VATS has been reported to cause less pain and ensure quicker recovery. We report a 43-year-old woman with chronic productive cough, who was diagnosed with an intrathoracic euthyroid goitre. She had thyroidectomy using the VATS approach with good postoperative outcome. VATS has been practiced in Nigeria for several years but has not been reported to be used for an intrathoracic goitre removal. This report is to highlight the feasibility and safety of surgical excision of intrathoracic goitre via the Uniportal VATS approach in a resource-limited setting.

Keywords: Marzouk procedure, Minimal Access Surgery, Thyroidectomy, Thyroid gland disease, Thoracotomy.

Introduction

A goitre is an abnormal enlargement of the thyroid gland; it can be benign or malignant. [1, 2] Goitres are primarily located in the neck; however, thoracic location can result from extension into the mediastinum or the presence of ectopic thyroid tissue.[3] Regarding thoracic extent, several classifications exist. Cvasciuc summarised these classifications and proposed a four-tier classification of retrosternal goitres.[4] Type A is a pyramidal goitre wholly in the neck, with the apex pointing down, which can be removed readily through a neck incision; type B is a pyramidal goitre with the apex pointing up, which mainly needs a sternotomy. Type C is bilobed with a pedicle connecting the cervical and intrathoracic parts, while type D is totally in the chest. Intrathoracic goitres may be ectopic, thus totally

disconnected from the main goitre in the neck, or connected to it by a stalk.[5]

McCort and Knobel reported an incidence of intrathoracic goitre of 0.2-45%. [6, 7] Intrathoracic goitre makes up about 5.8% of mediastinal masses according to Di Crescenzo et al. [3] The Approach to intrathoracic thyroidectomy can be combined cervical and thoracic (thoracotomy or sternotomy) [8] or a wholly thoracic approach can be sufficient. Video-assisted thoracic surgery (VATS) is a minimally invasive approach which can be used for thyroidectomy. Thoracotomy or sternotomy are associated with significant morbidities [9] compared with VATS, which has significantly less morbidity. [10, 11] Depending on the number of ports used, VATS can be 4-ports, 3-ports, 2-ports or uniportal. Uniportal VATS has been reported to cause less pain and ensure quicker recovery. [5]

VATS has been practiced in Nigeria for several years. Falase and Olusoji *et al.* have documented their experiences, [12, 13]; however, no VATS for intrathoracic goitre in Nigeria has been reported. We believe this case is the first of VATS for intrathoracic goitre in Nigeria. We aim to report the feasibility and safety of surgical excision of intrathoracic goitre via the Uniportal VATS approach in our environment.

Case Description

A 43-year-old woman presented with a 2-year history of a cough productive of whitish sputum. There was no fever, weight loss, neck swelling, cold or heat intolerance. There was no history of dyspnoea, dysphagia or menstrual irregularity. She lived in the north-eastern part of Nigeria and followed a regular local diet. There was no significant past medical history, allergies or chest trauma.

The physical examination revealed a middle-aged woman who appeared healthy; she was neither pale nor febrile. There were no eye signs, neck swelling, or significant peripheral lymphadenopathy. The cardiovascular system was essentially normal. The respiratory rate was 18 cycles per minute. The trachea was slightly deviated to the left and the percussion notes were resonant globally. The breath sounds were vesicular, with a few coarse crepitations in the right upper lung zone.

The patient was initially managed for pneumonia. Chest x-ray revealed an opacity in the medial part of the right upper hemithorax (Figure 1), necessitating cardiothoracic surgery consultation. A chest computerised tomographic (CT) scan showed a well-circumscribed mass in the superior mediastinum, compressing the trachea (Figure 2). Other investigations, namely thyroid function test, full blood count, serum electrolytes, urea, and creatinine, were all normal. A diagnosis of superior mediastinal mass – most likely an intrathoracic euthyroid goitre, was made. She was counselled for surgery and given the options of thoracotomy, sternotomy or VATS. She opted for a minimally invasive approach.

Procedure

The patient was put under general anaesthesia, with one lung ventilation and positioned in the left lateral decubitus position. Routine skin preparation and draping were done, and an 8cm utility incision was made in the right lateral chest wall in the 5th intercostal space, mid-axillary line. The wound was developed by blunt and sharp dissection into the pleural space, an incision retractor was placed, the anaesthetist collapsed the right lung and a 30-degree, 10 mm telescope was inserted (Figure 3). A mass, which measured 10cm by 10cm, was found in the superior mediastinum, posterior to the superior vena cava (Figure 4). An L-hook dissector was used to divide the mediastinal pleura, at which point troublesome bleeding was encountered; this was controlled with diathermy and pressure. The mass was then gently dissected from surrounding structures, and its stalk was divided using the Ligasure® device. The mediastinal pleura was closed with

Vicryl® 2-0 suture, and the specimen was removed in a specimen bag (Figure 5). A size 24fr chest tube was inserted, and the wound was closed in layers after lung re-expansion (Figure 6). The estimated blood loss was 700mls.

Post-operative care was in the intensive care unit for 12 hours, with routine antibiotics and analgesics. The chest tube was removed after 72 hours, when the chest tube drainage was 100 mL. Post-operative chest x-rays showed good right lung expansion (Figure 7). The patient was discharged on the 4th day post-surgery. Histopathological examination of the mass confirmed a benign goitre (Figure 8).

Consent: The patient gave informed consent for the use of her personal and clinical data in this report.

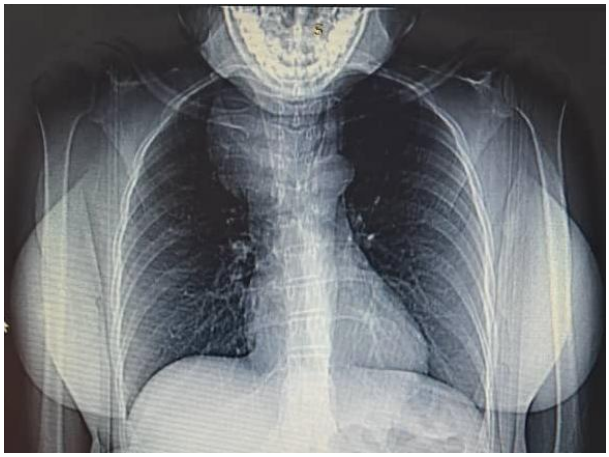

Figure 1: Pre-operative chest x-ray- superior mediastinal opacity

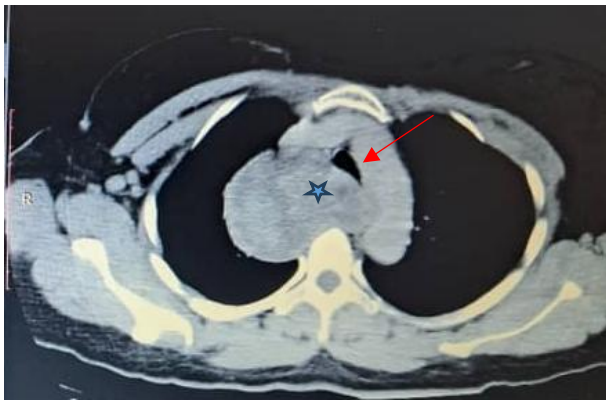

Figure 2a: Pre-operative chest CT scan axial view- mediastinal goitre (Blue star) compressing the trachea (Red arrow)

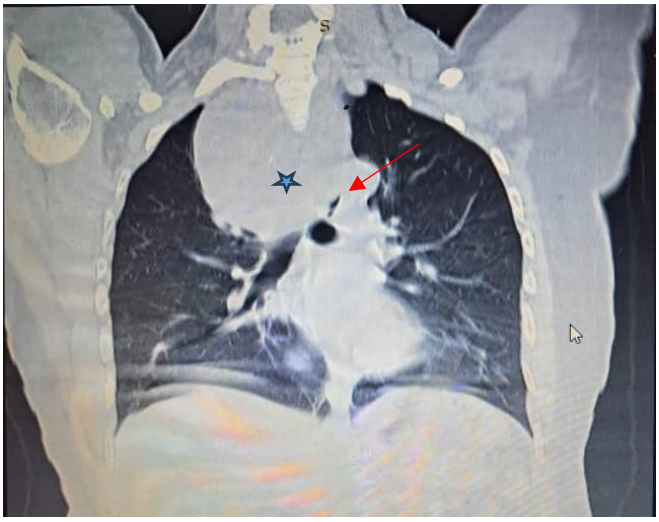

Figure 2b: Pre-operative chest CT scan coronal view- mediastinal goitre (blue star) compressing the trachea (red arrow)

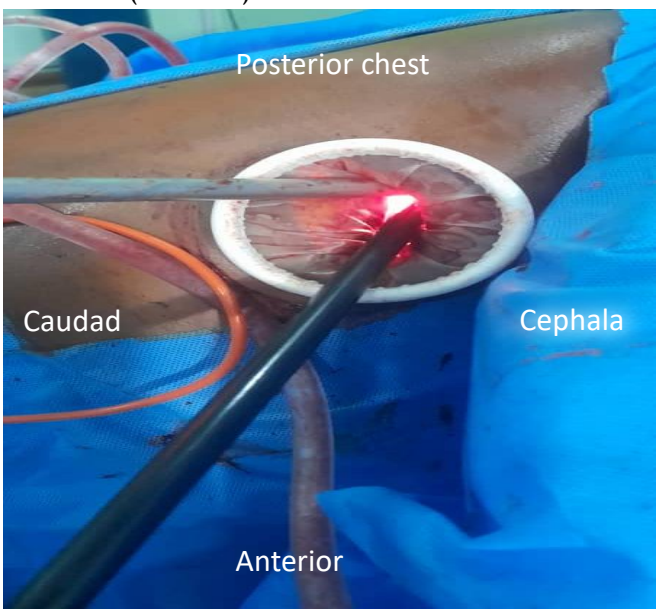

Figure 3: Wound protector, telescope *in situ*

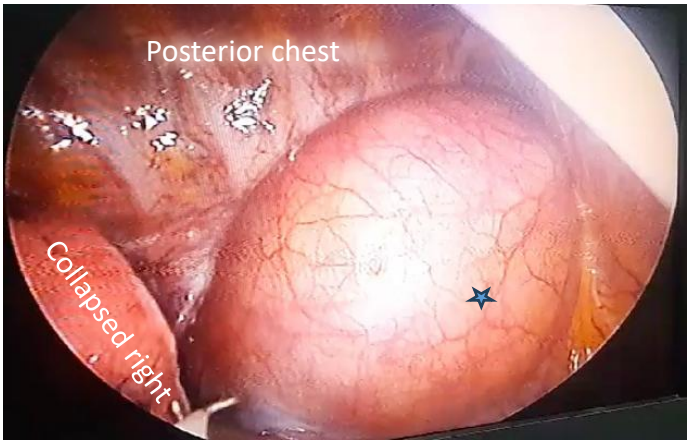

Figure 4: Mediastinal goitre (Blue star), L-hook diathermy tip at the inferior part of the mass

Figure 5: Resected mediastinal goitre specimen

Figure 6: Closed wound with chest tube *in-situ*

Discussion

The demographics of this case are, as usual, with presentation in a young woman who resided outside the goitre belt in Nigeria, which has been reported to range from "Akoko-Edo Local Government Area (LGA) in Edo State, through Igboetiti and Uzo-uwani LGAs in Enugu State, Kastina-Ala LGA in Benue State; Mangu and Bassa LGAs in Plateau State, Obudu and Obanliku LGAs in Cross Rivers State, Okpokwu, Ankpa, Idah, and Oturkpo LGAs in Benue". [14]

The symptoms can vary from those of excessive or reduced thyroid gland function to mass effects such as dyspnoea, cough, or obstructive sleep apnoea. The index patient presented with a cough, and she was in an euthyroid state. The mass was seen on the chest x-ray done to investigate the cough. Incidental findings are a known mode of presentation, as shown in the article by Gupta *et al.*, in which 1 of 7 cases underwent VATS thyroidectomy due to an incidental x-ray finding. [15] In addition to making a diagnosis, a chest x-ray has been reported to help assess classification and stratify the surgical approach.[16] Chest CT scan, however, gives more information for surgical planning as it reveals the part of the mediastinum the goitre is located, the laterality [15] and relation to the aortic arch, which is taken as a definite factor for sternotomy/thoracotomy approach. Any intrathoracic extension reaching the aortic arch requires an intrathoracic approach. [17] A combined approach may be required if there is a significant cervical component and to ligate the thyroid vessels. In some cases, the intrathoracic component is pushed into the neck to assist with the delivery – the Marzouk procedure. [8]

Figure 7a: Chest X-ray taken on Post-operative Day-1

Figure 7b: A Chest X-ray taken 2-week post-operatively

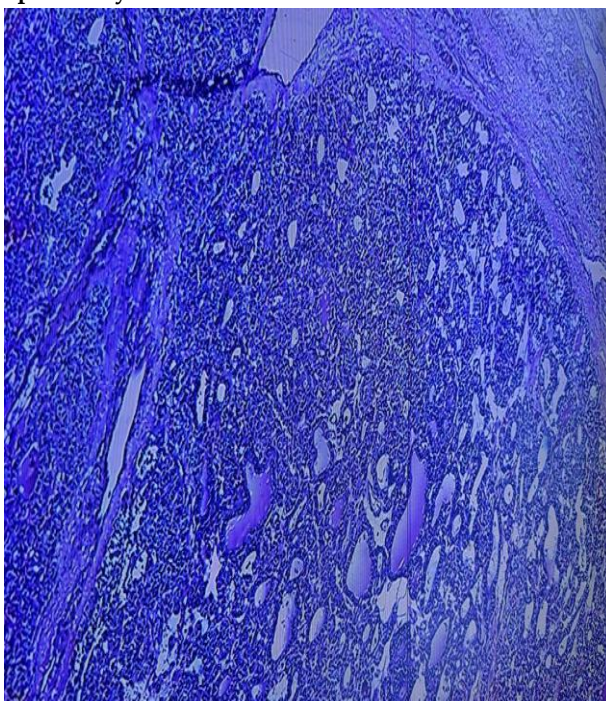

Figure 8: H&E X10 Magnification section showing a lesion composed of numerous thyroid follicles of various shapes and sizes, a focal area of stromal hyalinisation and myxoid degeneration seen with a follicle embedded within it, and some dilated follicles containing colloid.

This Marzouk procedure was described to reduce the morbidity of sternotomy. However, minimally invasive surgery, where feasible, avoids the morbidity of sternal instability, pain and anterior chest wall scar of a sternotomy; it also avoids the pain of rib spreading of a thoracotomy, in addition to the significant scar. These affect the respiratory function, hence the advantage of minimally invasive surgery. [10] The duration of admission is also shorter, and in our case, it has a good cosmetic scar measuring 10cm. Multiple port access for VATS is more common.[15] Of interest in this case report is that the patient has remained euthyroid for several months, which may suggest that the mass may be an ectopic goitre

Conclusion

Intra-thoracic goitres can be safely excised in our environment with the uniportal video-assisted thoracoscopic approach, with the benefits of reduced morbidity.

Authors' Contributions: AN conceived the study. All the authors conducted a literature review, drafted the manuscript, and revised it for sound intellectual content. All the authors approved the final version of the manuscript.
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