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Upfront Extensive Resection of a Patient with Thymic Carcinoma

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Abstract

Thymic carcinoma is a rare but aggressive subset of thymic epithelial tumors. It is usually diagnosed in advanced stage; patients with locoregional invasion requires multimodal treatment approach. However, evidence of the treatment sequence is still inconclusive. There is also a legitime clinical need to clarify the interaction of implants with the patient's organism and with upcoming adjuvant treatment. We report the clinical experience of a 56-year-old female diagnosed with a thymic carcinoma in May 2024. She underwent a radical resection with chest wall using titanium bars and clips as well as venous reconstruction involving left innominate vena-right artium using with Gore-Tex. The definitive pathological report revealed a pT3N2 R1 squamous thymic carcinoma G3. She experienced a week uneventful length of stay. She underwent adjuvant radio-chemotherapy.

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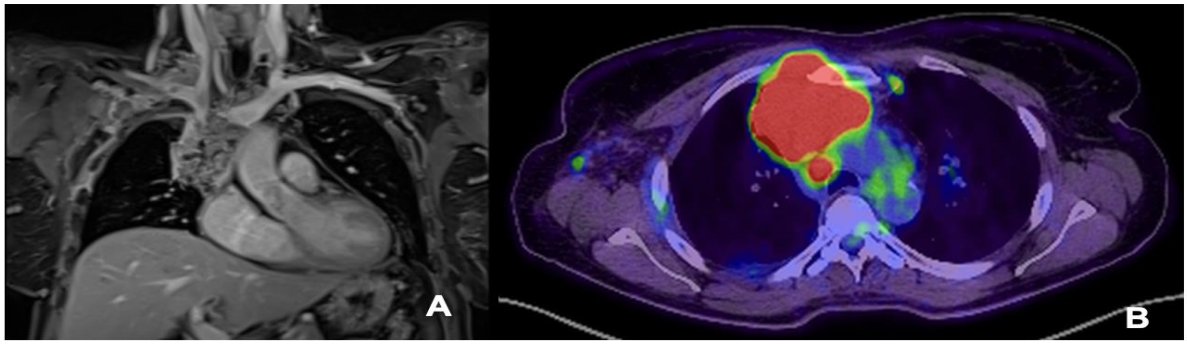
1. Introduction

Thymic carcinoma is an uncommon category thymic epithelial tumor with an annual incidence of likely 0.4 per million inhabitants, but it is aggressive with its diagnosis generally occurring in advanced stage (distant metastasis or locoregional invasion), requiring multimodal therapeutic approach. The sequence of therapeutical modalities, the choice of implant, its resistance or interaction with the patient's organism or adjuvant treatment are some real concerns that have clinicians while managing thymic carcinoma with locoregional invasion.

2. Case presentation

A 56-year-old female, presented to our clinic with debilitating right pectoral pain and no significant medical history. She was surgically diagnosed with a thymic carcinoma. Her Enhanced chest CT-scan revealed an anterior mediastinal tumor with cervical and mediastinal lymph nodes and invasion of one hand the superior portion of the superior vena cava and innominate veins confluence, on the other hand the right first and second ribs cartilages, that were confirmed on RMI (Fig 1). PET-CT showed high metabolic lymph nodes and anterior mediastinal activities (Fig1).



MRI: magnetic resonance imaging, PET-SCAN: positron emission tomography

Figure 1: Preoperative MRI and PET-SCAN.

An induction treatment was discussed but with an impairing symptomatology, the superior vena cava syndrome, lack of consistent evidence of its benefit and most importantly the patient decision indicated an upfront surgical resection.

She underwent an en-bloc thymic carcinoma resection with resection of right hemi manubrium, 3 first chondrocostal anterior arcs, right phrenic nerve, superior vena cava, right innominate vein, right upper lung lobe wedge, cervical and mediastinal lymph nodes. We prepared the right internal jugular vein (IVJ) canula for cardiopulmonary bypass (CBP) in case of SVC resection need. In a supine position, a sternotomy was performed, the resection was extended on the right side, after unsticking pectoral muscle. The venous dissection was immediately performed, an uncontrolled venous confluence injury indicated a 90 minutes cardiac bass- pass using femoral canulation and the preexisting IJV canula. Using CBP support, the superior vena cava was stapled a cm before its end, the right and left innominate veins were respectively stapled at the origine and the end. A number 8 mm Gore-Tex reconstruction was performed between the left innominate vein and the right atrium (Fig. 2).

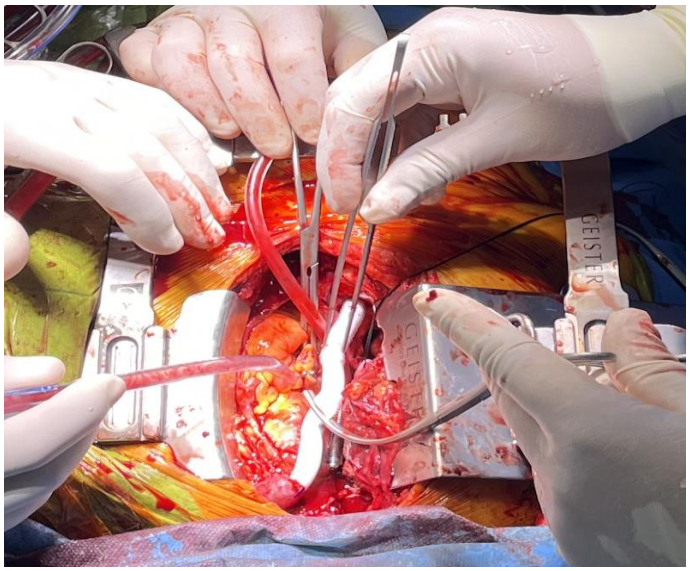


Figure 2: Venous reconstruction.

Chest frame was constructed 2 ribs titanium (Medexpert, Edmond, OK73003-USA) Fig. 3. We did not perform the diaphragm plication. The patient had a week length of stay. The definitive pathological report attested a poorly differentiated squamous thymic carcinoma pT3N2 R1. She was prescribed a live time acenocoumaral per day. She experienced recurrent non neoplastic pleural effusion, that was treated with an indwelling pleural drainage for 5 months. She underwent 30 radiotherapy cycles with 60 grays targeted to tumoral region and 50 grays in lymph nodes zones. The patient had 5 cycles of cisplatin, epirubicine and ciclofosfamid. She is now under oncologic follow-up. (Fig 3).

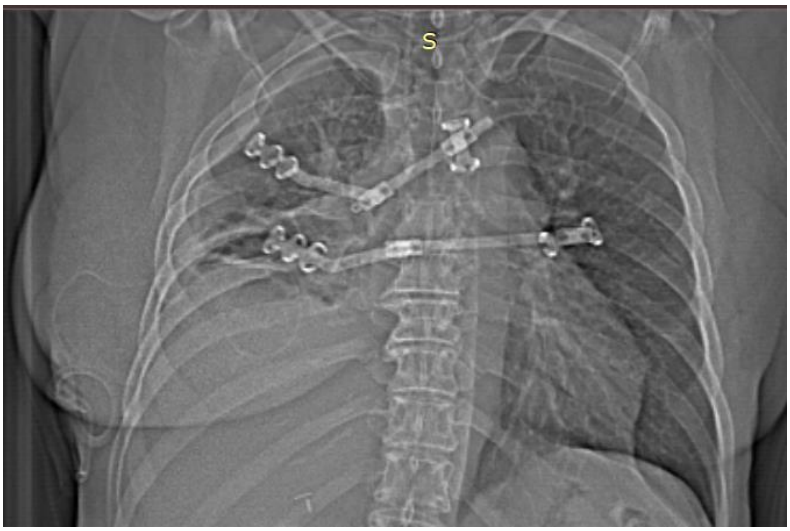


Figure 3: Postoperative 3 months Computed-Tomography.

3. Discussion

We presented an extensive intervention in a young patient with no compromising comorbidity. We think that an upfront surgical approach was an appropriate attitude, unlike we would reconsider performing a systematic diaphragmatic plication. We thought that the plication advantage was theoretical and that our patient is young and had no lung comorbidities; actually, we would systematically perform a diaphragmatic plication

consecutive to a phrenic nerve resection. The Gore-Tex venous prothesis has perfectly permeable (Fig 4) and intact after chemoradiotherapy.

Thymic epithelial tumors, especially thymic carcinoma are known for their chemo, radio sensitivity. Even though the use of induction treatment seems to be a mainstream, Yamada et al. reported in their Japanese national database cohort a prevalence 13% of induction therapies use for stage III thymoma(1), it was 25% versus 64% of adjuvant therapy in a European society of thoracic surgeons database(2), Parl et al reported 7.4% of patients who use induction chemotherapy compared to 92.6% of adjuvant chemotherapy in a national Korean database(3). The goal of induction chemo, radio or chemoradiotherapy is mainly to downsize the tumor with a likelihood of about 70% R0 resection, however some reports(3,4) attest the same proportion of complete resection in case of an upfront surgical. The indication of induction therapy in advanced-stage thymic carcinoma is still inconclusive, with reports(5) advocating it; some studies reporting no effect(2,3) of induction therapy, even a worse prognosis(1), additionally 10-30% of patients who had induction therapy might not be unable to undergo surgical resection. Randomized phase 3 clinical trials are needed to establish the role of induction treatment in advanced thymic carcinoma. Adjuvant therapy was confirmed as the strongest predictive for overall survival and cancer specific survival in a European database analysis(2).

4. Conclusion

We had a complex case with limited related literature evidence. An extensively invasive thymic carcinoma at a young female patient, we thought that the upfront surgical resection was the best approach. We would have considered a diaphragmatic plication. The left innominate venous-right atrium prosthetic reconstruction was the appropriate technique. The chest wall and the venous implants respectively did not interfere and did resist to the optimal adjuvant chemoradiotherapy schema.
We intended to have a R0 resection, but obtaining R1 in such an aggressive tumor, squamous thymic carcinoma, poorly differentiated G3, with chest wall and vascular invasion is clinically acceptable.

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Authors contributions: All authors have been involved in the patient treatment, they edited the manuscript. Lukadi Joseph Lula and Lucian Florin Dorobantu conceived the paper, Lukadi Joseph Lula conducted the edition.

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