

Surgical and Anatomical Particularities and Difficulties in Histopathological Sampling for Superior Vena Cava Syndrome

Particularități chirurgicale și anatomice și dificultăți în prelevările histologice pentru sindromul de venă cavă superioară

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Abstract

The superior vena cava syndrome is due to the increased venous pressure in the upper torso, neck and head, caused by the obstruction of the superior vena cava. Both external and internal factors cause obstruction (95% are malign causes), and the most severe manifestation is represented by cerebral edema that can even lead to coma. The diagnostic algorithm for the superior vena cava syndrome is widely known. There are many controversies and discussions about the safety of histopathological sampling. The purpose of this paper is to assess such risks, the complication rate and the diagnostic yield of surgical sampling, by analyzing the 26 interventions performed in our clinic. Although the complication rate was higher than that observed in the absence of the superior vena cava syndrome, surgery remains mandatory for a rapid histopathological diagnosis, therefore demanding a protocol that must include a mandatory extemporaneous exam of the biopsy.

Keywords: superior vena cava syndrome, surgical sampling, complications

Rezumat

Sindromul de venă cavă superioară se datorează creșterii presiunii venoase în regiunea toracică superioară, cap și gât ca urmare a obstrucției venei cave superioare. La baza obstrucției pot sta atât factori interni cât și externi (95% cauze maligne), iar cea mai severă manifestare o reprezintă edemul cerebral care poate duce până la comă. Algoritmul diagnostic al sindromului de venă cavă superioară este binecunoscut. Există multiple controverse legate de siguranța prelevării de fragmente pentru examen histopatologic. Obiectivul acestei lucrări este evaluarea riscurilor, a ratei complicațiilor și a randamentului diagnostic al abordului biptic chirurgical, prin analiza celor 26 de intervenții efectuate în clinica noastră. Deși rata complicațiilor a fost mai mare decât în absența sindromului de cavă superioară, biopsia chirurgicală rămâne indispensabilă pentru un diagnostic histopatologic rapid, impunând astfel crearea unui protocol care să includă examenul extemporaneu al piesei de biopsie.

Cuvinte-cheie: sindrom de venă cavă superioară, biopsie chirurgicală, complicații

Introduction

The superior vena cava syndrome is due to increased venous pressure in the upper torso, neck and head caused by the obstruction of the superior vena. Both external and internal factors cause obstruction (95% are malign causes). Clinical manifestations in patients with superior vena cava syndrome include: cape edema, frequently associated with cyanosis, plethora, stridor, dyspnea or dysphagia. The most serious consequence of the obstruction of the superior vena cava is the cerebral edema which can manifest itself as coma^(1,2). The malignant etiology is dominated by pulmonary masses and non-Hodgkin lymphoma. Lung carcinoma (Figure 1) is present in over 80% of the cases while lymphomas cause 12% of the superior vena cava syndromes. Other causes may include thyroid and thymus carcinoma, germ cell tumors or metastases^(3,4). The diagnostic algorithm in the superior vena cava syndrome is widely known. In the case of lung masses, the histopathological sampling can be performed during fibrobronchoscopy, thoracoscopy or thoracotomy⁽⁵⁾. Mediastinotomy or mediastinoscopy are deemed appropriate biopsy options for lymphoma. There are many controversies and discussions about the safety of histopathological sampling. The purpose of this paper is to assess such risks and the yield of sampling.

Methods and materials

The analysis concerns 26 surgical interventions performed to obtain the histopathological tissue, over a period of 3 years, in patients with superior vena cava syndrome hospitalized at the Thoracic Surgery Department of the Pulmonology Hospital in Iasi. We analyzed the anatomical approach paths: peripheral lymph node biopsy – 12 cases, mediastinoscopy – 4 cases, mediastinotomy – 5 cases, thoracoscopy – 1 case, thoracotomy – 4 cases (Figure 2).

Results and discussion

By analyzing the surgical interventions performed in order to obtain a biopsy tissue in patients with superior vena cava syndrome, we were able to assess the effectiveness of the histopathological findings and the complication rate. We obtained a histopathological sample for all cases and a malignant cause was found in 100% of the cases. In 9 cases, the histopathological result could establish the diagnosis of lymphoma, while lung carcinoma was found in 17 cases.

The main complications (Figure 3) were represented in one mortality case and 12 morbidity cases. A postoperative hematoma occurred in two patients for which the thoracoscopy and mediastinoscopy approach was used. A second

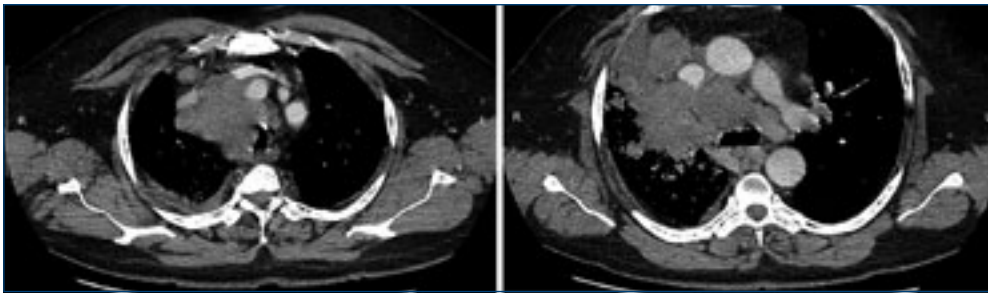


Figure 1. CT scan showing left lung carcinoma

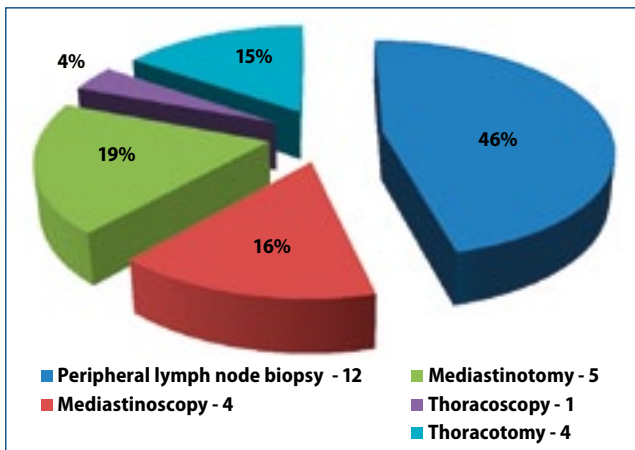


Figure 2. Anatomical approach routes

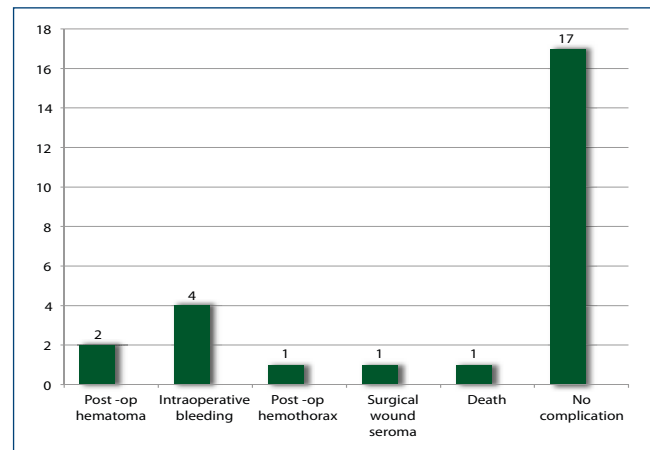


Figure 3. The main complications

intervention was required to evacuate the hematoma for the patient with the thoracoscopy approach, while a spontaneous resorption was observed in the patient with the mediastinoscopy approach. Intraoperative bleeding occurred in four cases, which were resolved during surgery. A case of postoperative hemothorax was encountered in a patient for whom the biopsy was performed through thoracotomy, but was solved by repositioning the drainage tube.

The most common complication in lung surgery was represented by minor air losses, which were resolved spontaneously. The average duration for the airline losses was 48 hours, with the longest postoperative period being 4 days.

Also, there was one case of surgical wound seroma in a patient with right anterolateral thoracotomy.

A particular case was represented by a patient with a complex pathology, a history of healed pulmonary tuberculosis, where the differential diagnosis between lung cancer and tuberculoma was necessary. Therefore, a lung biopsy was performed through right anterolateral thoracotomy. Surgery was performed without any incidents, only one postoperative complication represented by minor aerial losses, spontaneously resolved in the second postoperative day. In the fourth postoperative day, the patient experienced an episode of acute respiratory distress, followed shortly by cardio-respiratory arrest and death due to cardiogenic pulmonary edema.

There were no postoperative complications for patients with peripheral node biopsy.

Although the complication rate was higher than in the absence of the superior vena cava syndrome, surgery remains mandatory for a rapid histopathological result, therefore demanding a protocol that needs to include a mandatory extemporaneous exam of the biopsy.

Conclusions:

1. The dominant etiology for the superior vena cava syndrome is represented by lung carcinomas and lymphomas;
2. Histopathological sampling is a key factor in the diagnosis process, which is essential for subsequent therapeutic conduct;
3. Post procedural complications may include postoperative bleeding, postoperative hematoma, air loss or surgical wound seroma;
4. The complication rate is higher in patients with superior vena cava syndrome, than in the absence thereof;
5. The creation of a protocol that needs to include a mandatory extemporaneous exam of the biopsy is necessary. ■

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