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Case Report

Thoracoscopic Resection of Solitary Pulmonary Nodule in Child

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Abstract

Minimally invasive surgery constitutes one of the greatest advances of medicine in the last three decades. Pediatric surgery has not escaped this progress; in fact, nowadays there are many indications to perform this technique on children. Solitary pulmonary nodule is defined as a spherical lesion surrounded by healthy parenchyma, not associated with atelectasia and without mediastinal lymphadenopathy. We present a nine-year-old girl, with radiological evidence of a solitary pulmonary nodule located at base of the right lung field. A thoracoscopic resection was performed. Oncological pathologies, tuberculosis, mycosis and deposit illnesses were discarded. The only positive serology was for Chlamydia pneumoniae (IgM); however, the patient never presented clinical lower respiratory infection before her admission. The biopsy determined an encapsulated nonspecific inflammatory lesion. We conclude that thoracoscopy should be the method of choice for any thoracic injury in children.

Keywords: *Minimally Invasive Surgery; Thoracoscopy; Solitary Pulmonary Nodule*

Introduction

The thoracoscopic was introduced for the first time in pediatrics by Bradley Rodgers, in the nineteen seventies of the Twentieth century. With this method he carried out mainly explorations diagnosis, biopsy taking and empyema management [1]. At present, the thoracoscopic has multiple indications in pediatrics, such as lobectomy, congenital pulmonary malformations (pulmonary sequestration, adenomatoidéa disease CF/congenital lobar emphysema/Cysts Bronchogenic), resection of mediastinal tumors, Atresia Diaphragmatic hernia, defects of the chest wall (Excavatum, Escavatum and Carinatum) and closure of arteriosus ductus [2,3].

The thoracoscopy offers all the benefits of minimal invasive surgery, such as less postoperative pain, fewer days of hospitalization, sooner restart of activities, less percentage of injury infection and Emergence of Eventrations. All these advantages add, and especially in the pediatric patient, which are avoided Chest wall deformities and neuromuscular sequelae described in conventional thoracotomy. Likewise in the newborn is diminished the time these patients need mechanical ventilation and the start of the oral track is faster. In general, all these advantages affect the clinical aspect in reducing morbidity and mortality, As well as in the economic aspect, by decreasing the time of hospitalization. The solitary pulmonary nodule is defined as a spherical injury surrounded by Healthy Parenchyma, not associated with atelectasis and no mediastinal lymph nodes, the size of which varies between 0.8 cm minimum and maximum 6 cm [4] is detected in one of every 500 radiological studies carried out in Adult and computerized axial tomography being the Gold Standard for the evaluation of Nodular lesions [5,6].

Clinical Case

This is a 9-year-old female school who Seven months prior to his hospitalization, presented Clinical of Sudden loss of consciousness and postural tone, compatible with syncope, reason for which she was evaluated by Pediatrician Cardiologist who indicated to perform Anteroposterior Radiograph of thorax in which the image of a Module Solitaire Radio Lú Acid located at the base of the right pulmonary field (Figure 1).

Figure 1: *Rx of Thorax PA.*

Computerized axial tomography was performed Rax with against endovenous, which confirmed the presence of a Lesion 2 cm x 1,7 cm at low level, Lower right bulo in its rear segment (Figure 2).

Figure 2: *Chest CT scan.*

Abdominal ultrasound and abdomen and pelvis tomography showed no injury, and the PPD was negative. Serologies for toxocariasis cytomegalovirus.

Epstein Barr and Mycoplasma Pneumoniae were negative; While the Chlamydia serology was positive Pneumoniae (Elisa IgM). Spirometry was normal. Fungal serology (Histoplasmin, Paracoccidioides Coccidioidin and Aspergilloma) was negative. Hb was 12 g%, Leukocytes: 8,500 per field, Sec: 64%, Linf: 36%, VSG: normal, qualitative negative PCR and LDH: 151 U/L.

Thoracoscopy Diagnosis was carried out under general anesthesia, the patient was placed in left lateral decubitus and introduced Trocar 5.5 mm V-level intercoastal right space with clavicular midline for optics 5 mm and 30°, as well as placing two Trocars Additional 5 mm at the level of IV right intercostal space with anterior axillary line and VII intercostal space right with anterior axillary line respectively for instruments. The pneumothorax was carried out with a CO_2-insufflation pump at a pressure of 4 Mmhg and at a flow of 2 Lts/min.

An unique and round injury was identified of approximately 3cm of diameter, located in the rear of right lower lobe (Figure 3), which was dissected by Lusen Tweezers and Coagulation with Bipolar Clamp. The injury was well delimited, encapsulated and did not infiltrated the adjacent pulmonary parenchyma (Figure 4).

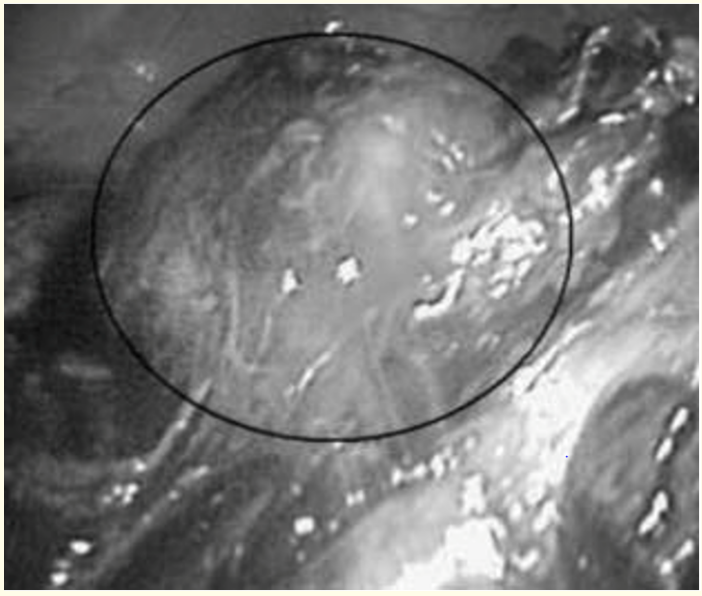

Figure 3: *Solitary pulmonary nodule.*

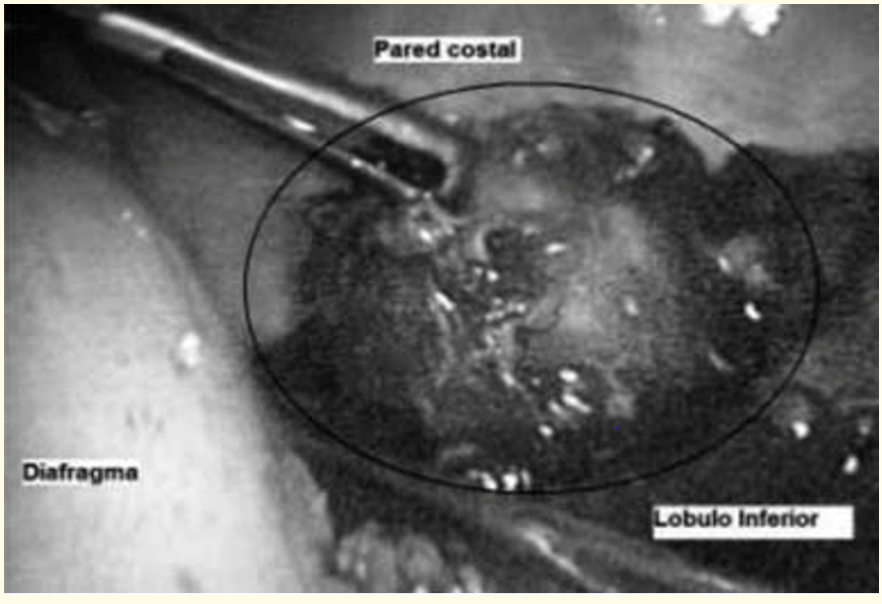

Figure 4: *Solitary pulmonary nodule dissection.*

The piece was extracted from the thoracic cavity under direct vision by enlargement of approximately 3 cm length of the optic port and sent for pathological study (Figure 5). The surgical time was 2 hours and 20 minutes.

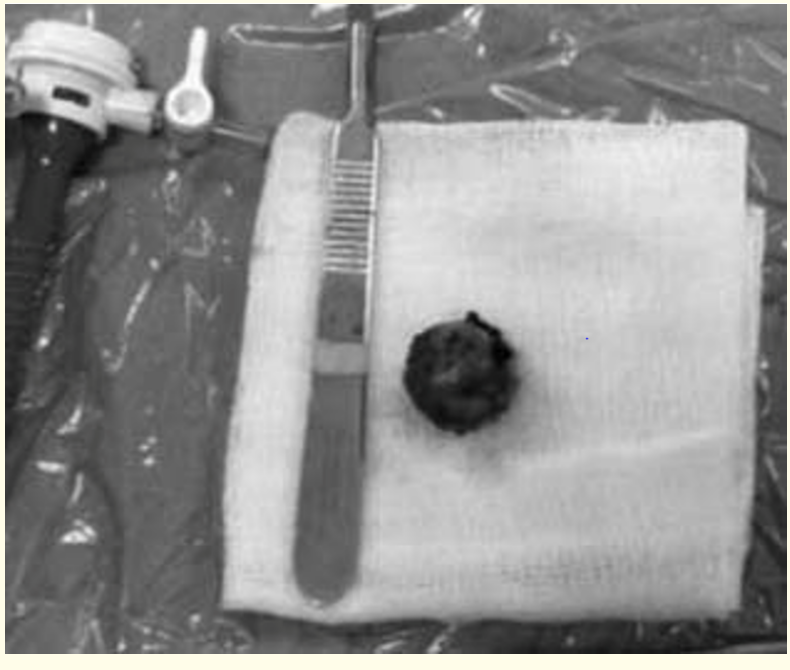

Figure 5: *Anatomical piece.*

The result of pathological anatomy reported necrotic nodule encapsulated with chronic inflammation and Giganto-Cellular reaction, being negative the coloration of Ziehl-Neelsen to demonstrate resistant acid-alcohol bacilli, as well as silver Reticuline impregnation of Grocott to investigate mushrooms.

The patient remained with chest drainage for 2 days and was discharged to the 5th day of the postoperative, leaving in good general and asymptomatic conditions.

Discussion and Conclusion

Minimum invasive surgery constitutes the first election as a diagnostic and therapeutic approach in the great majority of Molecular Pathology Surgeries both abdominal and Thoracic in almost all developed countries. Pediatric patients benefit from this Technique. There are well-known the big advantages that contribute to them versus open surgery.

The Solitary pulmonary nodule is an entity widely described in adult patient and it is of great importance to diagnose the frequency of malignant tumors which oscillates between 40 and 80% according to Anglo-Saxon literature; and between 25 and 74% according to works published in Mexico [4]. Lillington describes a percentage low of malignancy (40 - 50%), with the remaining 50 - 60% corresponding to benign lesions. Among these, 80% are inflammatory processes or granulomas associated with tuberculosis or diseases Micó [9].

Causes include malignant lesions, infectious, Non-infectious, congenital and miscellaneous [7] (Table 1). In the pediatric area there are few reports of this Entity at both national and international level [8].

Malignant	Benign	Infectious	Non-infectious	Several
Carcinomas	Hamartoma	TBC	Rheumatoid arthritis	Hematoma
Adenocarcinoma	Lipoma	Histoplasmosis	Sarcoidosis	Pseudotumor
Solitary metastases	Fibroma	Coccidioidomicosis	Granulomatosis	Amyloidoma

Table 1: *Differential diagnosis of solitary pulmonary nodule.*

Fuente: Lillington [7].

Recently it was reported in Mexico a case in a pre-school male, three years old [8]. The Diagnostic was made by simple Radiography of Thorax PA and computerized axial tomography. The surgical approach was done by conventional open thoracotomy. The pathological result reported Benign Inflammatory myofibroblastic tumor (Pseudotumour Inflammatory/granuloma of plasma cells).

Classically, it has been described that the great majority of the pulmonary masses in pediatric patients are not malignant, and that the nodules are of granulomatous origin. Also, The tumor lesions of infectious origin and congenital malformations out numbers the neoplastic lesions. The pulmonar metastasis disease is caused mainly by Wilms ' tumor and is followed in frequency by Sarcomas. Primary malignant tumors are not frequent in Pediatric patients [10].

At present, there is controversy to decide to perform the resection of a solitary pulmonary nodule. There are not reliable guides fully evidenced for the confrotation of this entity.

The great majority of adult studies take into account the probability of the malignancy based on age, cigars consumption, family history of cancer and diameter of the nodule [6]. In pediatrics, the most important parameters to take into account would be the age of onset of lesion as well as clinical manifestations [8].

The vast majority of solitary pulmonary nodules are resecable. This is why the thoracoscopy is very important as diagnostic and therapeutic method because it is almost free of mortality, it has scarce morbidity and offers a short hospital stay [11]. These advantages are valid in children, even if it is suspected of malignant pathology, as every day minimal invasive surgery has more Diagnostic and therapeutic indications in Pediatric Oncology [12].

In terms of the etiology of the solitary pulmonary nodule in this patient oncological pathologies, tuberculosis, Mycosis and deposit diseases were discarded. Only chlamydia serology was positive for Pneumoniae (IgM); However, the patient never presented clinic of low respiratory infection before her admission to pediatric surgery. There are not reports that Chlamydia Pneumoniae infection produces a solitary pulmonary nodule. The pathological result concluded a Non-specific encapsulated inflammatory injury.

It is concluded that the thoracoscopy should be the first therapeutic-diagnosis election for any thoracic injury at any pediatric age.

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