Journal of Clinical Trials
ISSN: 2167-0870

Abdellatif et al., J Clin Trials 2019, 9:6

Case Report Open Access

Solitary Benign Primary Intra-Pulmonary Schwannoma of the Left Lower Lobe

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Received date: October 1, 2019; **Accepted date:** October 12, 2019; **Published date:** October 22, 2019

Abstract

Schwannomas are erratic benign tumors of nerve sheaths. We herein report a remarkably rare case of intrapulmonary schwannoma of the left lower lobe. A 46-year old European lady presented with chronic dry cough with an abnormal shadow found on her chest X-ray. Chest computed tomography along with Positron Emission Tomography showed an oval mass in the posterior segment of the left lower lobe with a standardized uptake value of 4.1. Thoracoscopic wedge resection was undertaken. The diagnosis was bolstered by histopathological and Immunohistochemical methods. The lady had a smooth post-operative course with no recurrence on follow-up.

Keywords: Pulmonary neoplasm; Intra-pulmonary schwannoma; Neurogenic tumor; Computed tomography

Abbreviations: LLL: Left Lower Lobe; CT: Computed Tomography; S9: Bronchopulmonary Segment 9; FDG: 18-Fluorodeoxy-Glucose; PET: Positron-Emission Tomography; SUVmax: Standardized Uptake Value; VATS: Video-assisted Thoracoscopic Surgery

Background

Thoracic neurogenic tumors are comparatively rare and arise within the embryonic neural crest cells, which establish the ganglia, paraganglionic, and parasympathetic systems. They are found almost utterly in the mediastinum and seldom presented as an intrapulmonary mass. Schwannomas originate in the Schwann's cells in the nerve sheath and are genuinely encapsulated [1]. They present silently or with a wide diversity of non-specific symptoms that might delay the diagnosis [2]. The clinical scenario depends on the extent of bronchial obstruction and the tumor size [3]. Symptoms are typically none or productive cough, wheezing, chest pain, fever due to obstructive pneumonia [4], and uncommonly hemoptysis [5]. Herein, we report a case of primary intrapulmonary schwannoma of the left lower lobe.

Case Presentation

A previously healthy 46-year old non-smoker lady presented with a 3-week history of chronic dry cough. Her physical examination and routine laboratory tests were unremarkable. Her chest X-ray showed a sharply defined, rounded mass lesion in the Left Lower Lobe (LLL). The mass was about 40 × 20 mm in diameter with no visible calcifications. Chest Computed Tomography (CT) showed a round and homogeneous mass 36 × 19 mm in size with a well-defined margin located in the posterior basal segment of the LLL (S9). 18-Fluorodeoxy-glucose (FDG) Positron-Emission Tomography (PET) showed accumulation in the tumor with maximal standardized uptake value (SUVmax) of 4.1. The CT and FDG-PET findings proposed the likelihood of malignancy (Figure 1).

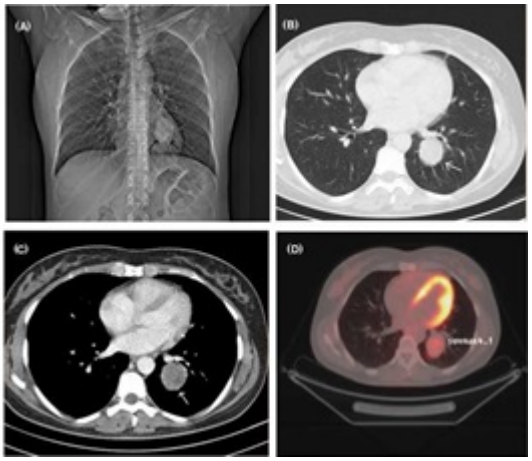

Figure 1: Radiological findings.

Video-Assisted Thoracoscopic (VATS) resection of the mass with intraoperative frozen section pathological analysis was planned. We used two ports at the 7th intercostal Space in the anterior and posterior axillary lines plus a 5cm utility incision in the 5th intercostal space laterally. We preferred 10 mm 30-degree Thoracoscopic system (Olympus Inc, Center Valley, PA, USA) (Figure 2).

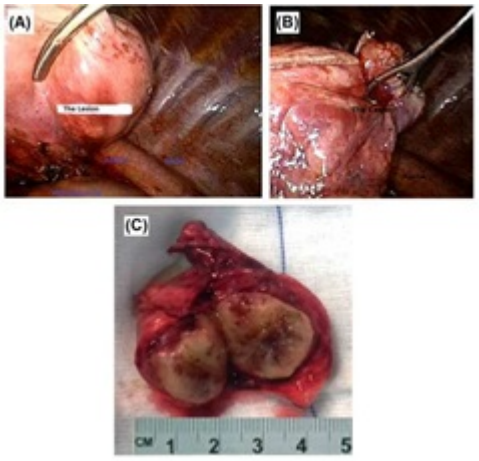

Figure 2: (A) and (B) Intraoperative Thoracoscopic picture demonstrating the location of the lesion at the left posterior basal segment (S9) (C) Macroscopic appearance.

The chest cavity was explored. Neither pleural changes nor enlarged lymph nodes were detected. The site of the intraparenchymal mass was also consistent to the PET-CT findings (Figure 2A, 2B). It was apparently firm and had a smooth surface upon instrumental palpation. A wedge resection of the posterior basal segment of the LLL was performed by EGIA Tristapler with 60 mm Articulating Extra-Thick Reload (60AXT); (Covidien, Mansfield, MA, USA). The frozen section pathology excluded the presence of malignant cells and gross examination showed a firm well demarcated, encapsulated tumor, measuring 40 × 20 mm in size and weighed 40 grams. The cross-section was solid, yellowish-white in color, with no areas of hemorrhage or necrosis. The histopathological report described the presence of Antoni type A cells suggesting the diagnosis of intrapulmonary schwannoma characterized by the dense spindle shaped cells with palisade formation, with no areas of atypia, mitosis, necrosis or malignancy without capsular or adjacent pulmonary tissue invasion (Figure 3).

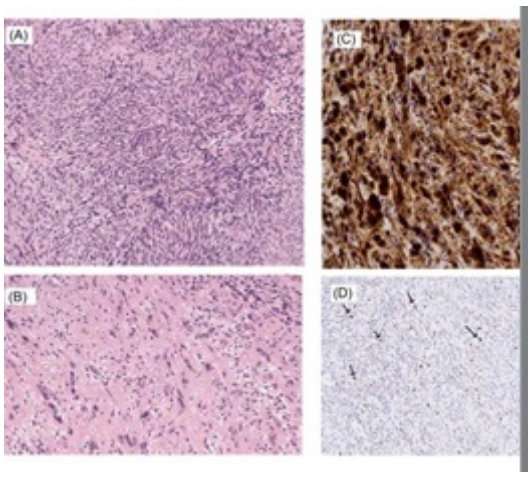

Figure 3: Microscopic examinations of the resected tumor.

Immunohistochemical staining of the tumor cells was positive for S-100 protein with a Ki-67 proliferative index of 2% which is the proportion of positive tumor cells out of 1000 tumoral cells counted in 10 microscopic fields at × 400 magnification, and was negative for CD34 and desmin confirming the diagnosis of benign schwannoma

The postoperative course was uneventful. The chest drain was removed on the fourth post-operative day. Follow up after 4-months, 8-months and 1-year showed no recurrence radiologically with disappearance of symptoms.

Discussion

Schwannomas, also known as neurilemmomas or neurinomas, encapsulated benign tumors of the nerve sheaths, and are relatively common in the posterior mediastinum. Intrapulmonary schwannomas are exceptionally infrequent with only strewn cases described in the literature [1], especially in Europe [2]. They are estimated to account for only 0.2% of all pulmonary neoplasms [3], and can arise in the pulmonary parenchyma, or tracheobronchial tree, with endoluminal and/or extraluminal extensions [3]. Histologically, schwannoma spindle cells are organized in a highly cellular and palisading nuclei pattern (Antoni A) or a less cellular and more fibrous pattern (Antoni B) [6]. Signs of malignant transformation include absence of capsule, perineural invasion, unclear cellular borders, increased mitotic figures, pleomorphic fusiform cells, areas of hemorrhagic and cystic degeneration, and metastasis [6]. Cases examined by FDG-PET before surgery has been rarely reported in literature, showing a broad range of accumulation. Reportedly, the SUV value of schwannoma is poorly correlated with tumor size, density, and cellular proliferative ability and differentiation between malignants schwannoma and malignant soft tissue tumor is difficult [7]. The commonly performed treatment is surgical resection and it may range from wedge or sleeve resection, lobectomy or even rarely pneumonectomy [3]. Definitive treatment using bronchoscopy has evolved for small pedunculated lesions including resection by forceps, laser, cryotherapy, radiofrequency or electrosurgical snaring, or intra-lesional ethanol injection [8].

Conclusion

In conclusion, schwannoma is extremely erratic, and reporting these tumors are valuable to be taken in consideration for differential diagnosis of an intrathoracic lesion. Both surgical and bronchoscopic resection is indispensable according to the clinical scenario. Imaging can be found and conclusive diagnosis is attained through histopathology and immunohistochemistry.

Ethical Approval

The authors have complied with the World Medical Association Declaration of Helsinki regarding ethical conduct of research involving human subjects. The patient was consented for publication of the clinical data while ensuring confidentiality of personal information. The Case report was approved from the Institutional Research Board.

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