

A Boy with Cough & Chest Pain

Naw Mu Lah Eh Min

Khin Thi Lwin

Wynn Wynn Aung

Kyaw Swar Lin

Linn Zaw Win

14 Years Old Boy

- Admitted to Chest Surgical Unit for
- C/O dull aching pain in Rt chest
- Dry cough x 2 month
- No dyspnoea, haemoptysis
- Fatigue, LoA (+)

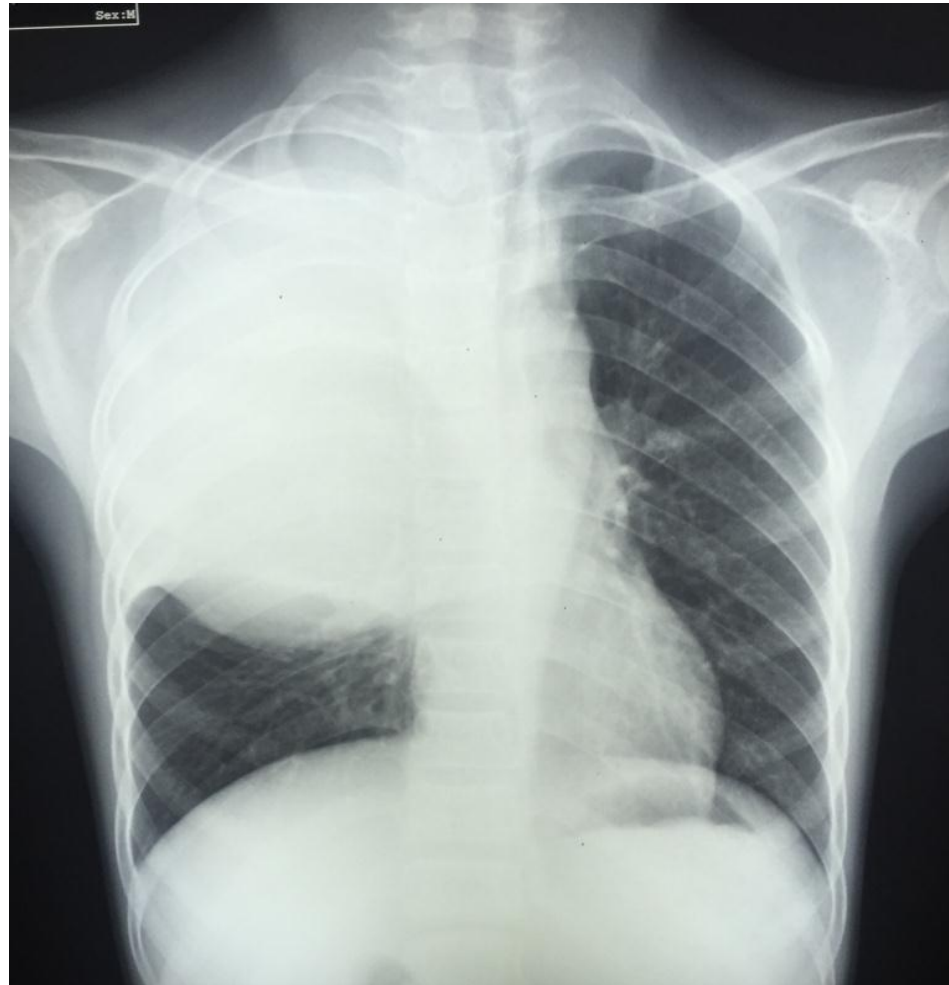


Physical Examination

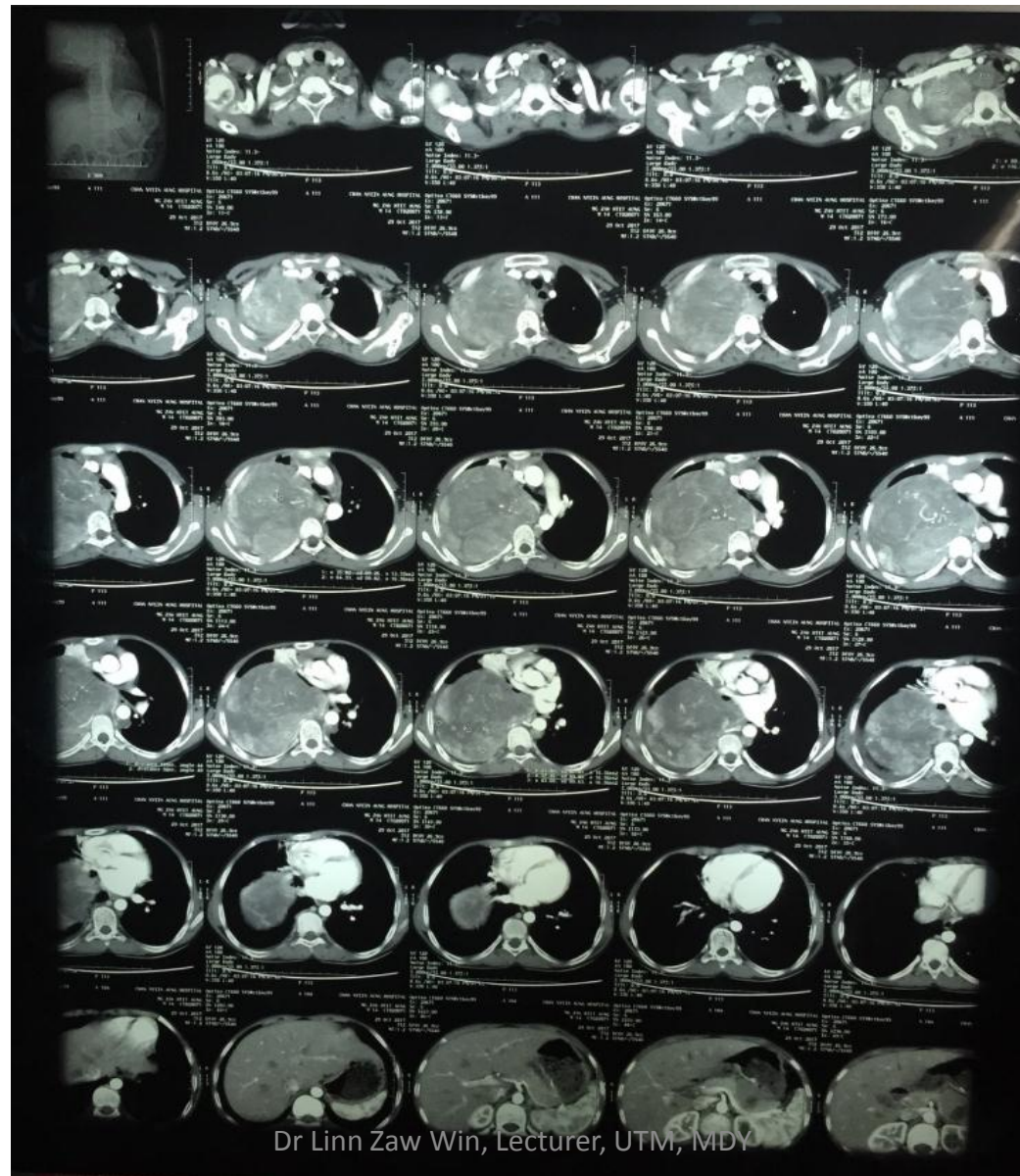
- 14 Years old Boy
- PS 1
- Not dyspnoeic
- Cough (+) during exam:
- Palpable LN in LSCF
- Reduced VBS on Rt chest
- Abdomen/Genitals - NAD



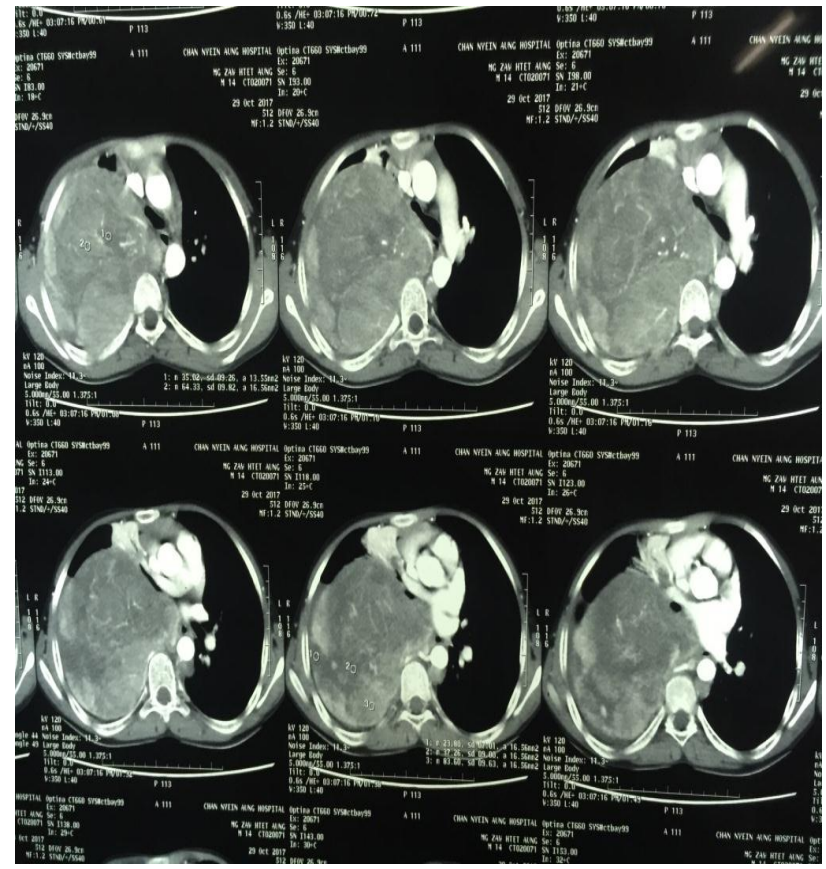
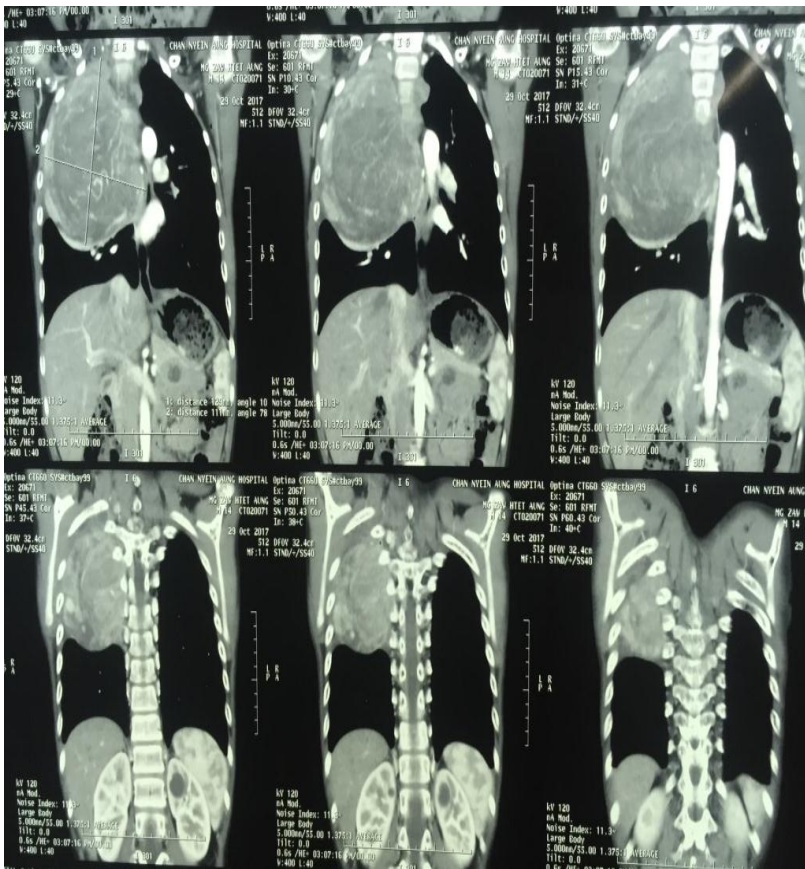
CXR (PA) 11.10.2017



Chest CT Scan (29.10.2017)

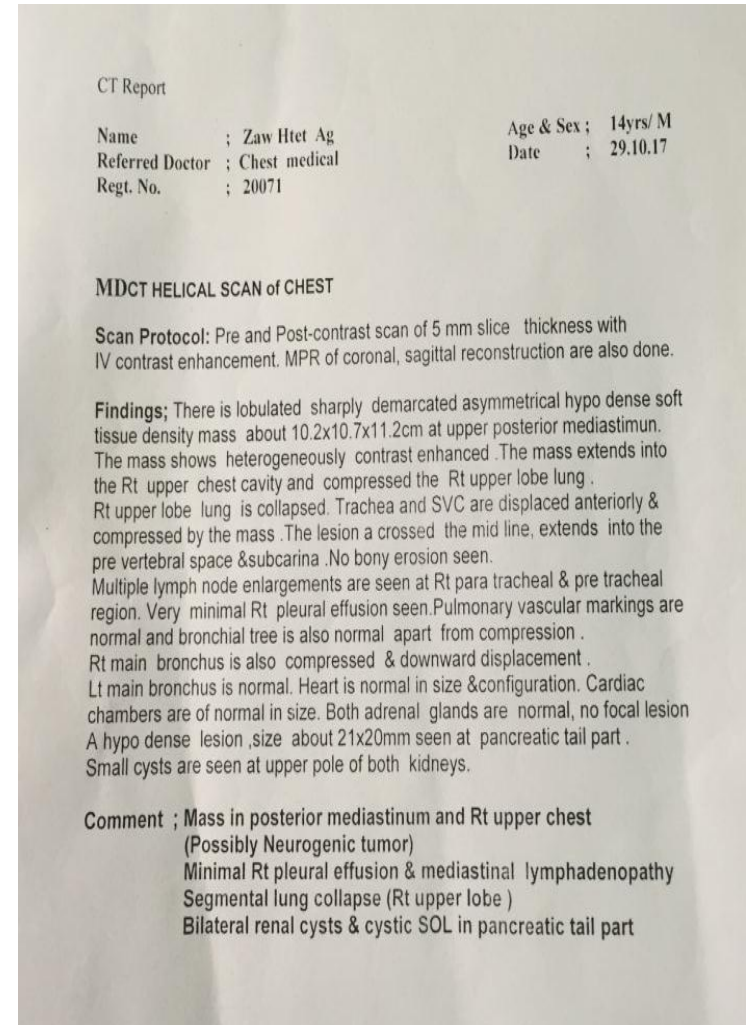


CT Scan (29.10.2017)



CT Comments

- **Mass in posterior mediastinum and right upper chest**
- **Possibly neurogenic tumour**
- **Minimal right pleural effusion & mediastinal lymphadenopathy**
- **Segmental lung collapse (RUL)**
- **Bilateral renal cysts & cystic SOL in pancreatic tail part**



Biopsy

1. Tru - cut needle biopsy of Rt Lung
2. Left supraclavicular lymph node

Gross Examination

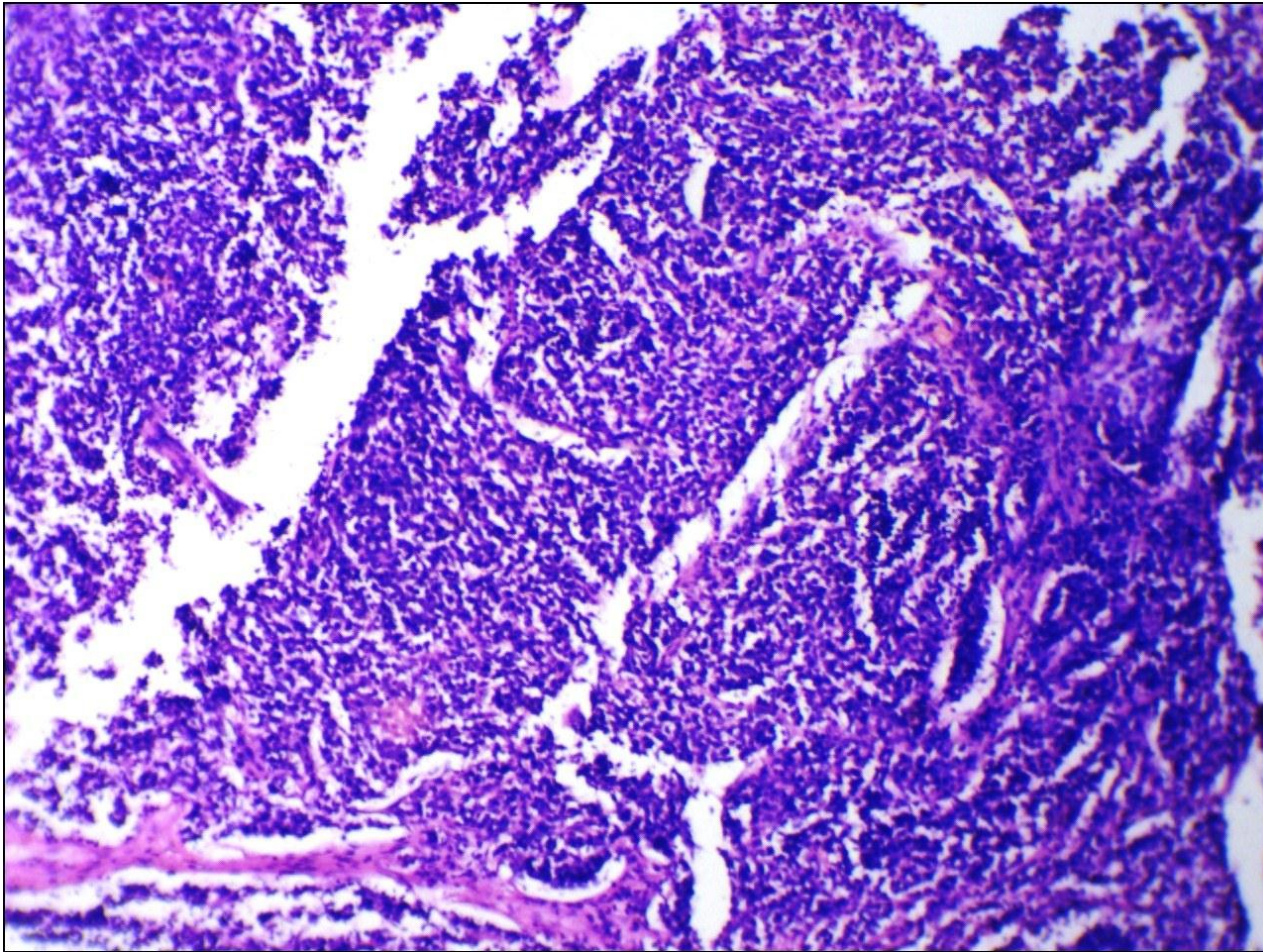
1. Tru - cut needle biopsy of Rt Lung

Two pieces of tiny slender tissue; 0.7 x 0.1 cm and 1 x 0.1 cm in g.d.

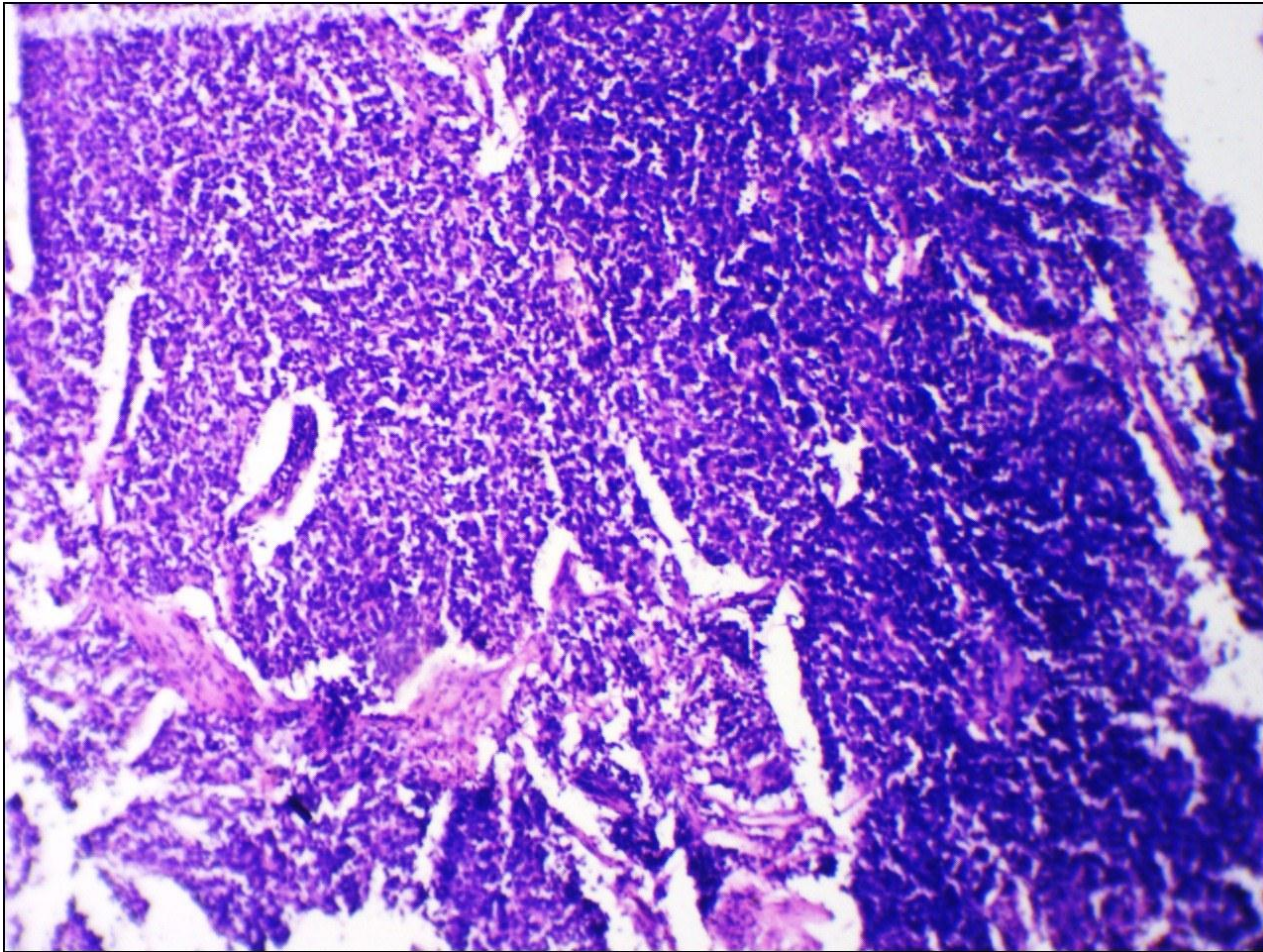
2. Left supraclavicular lymph node

Grey white tissue; 2 x 1.8 cm in g.d. with brownish foci

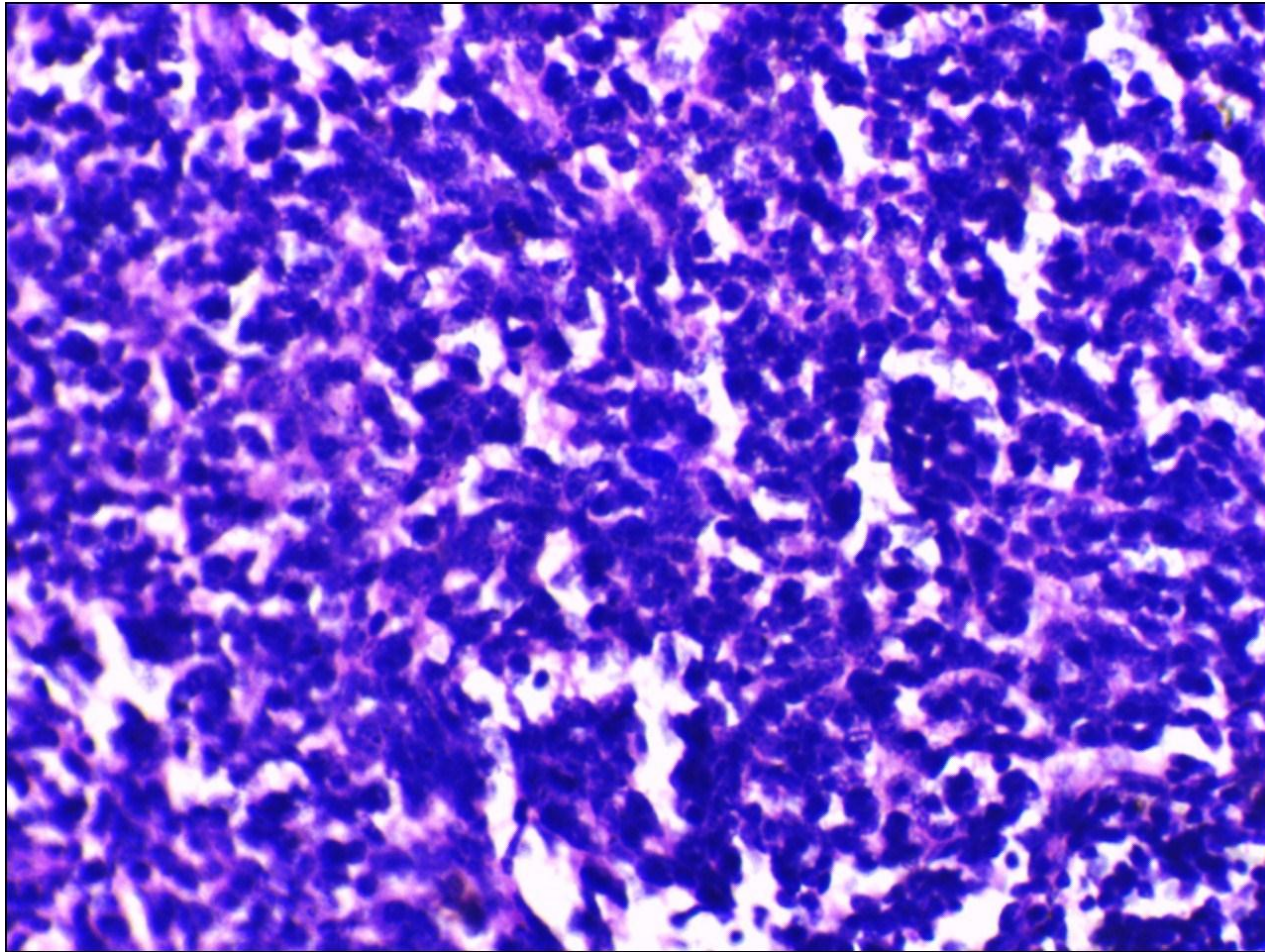
Microscopic Finding (H&E x 100)



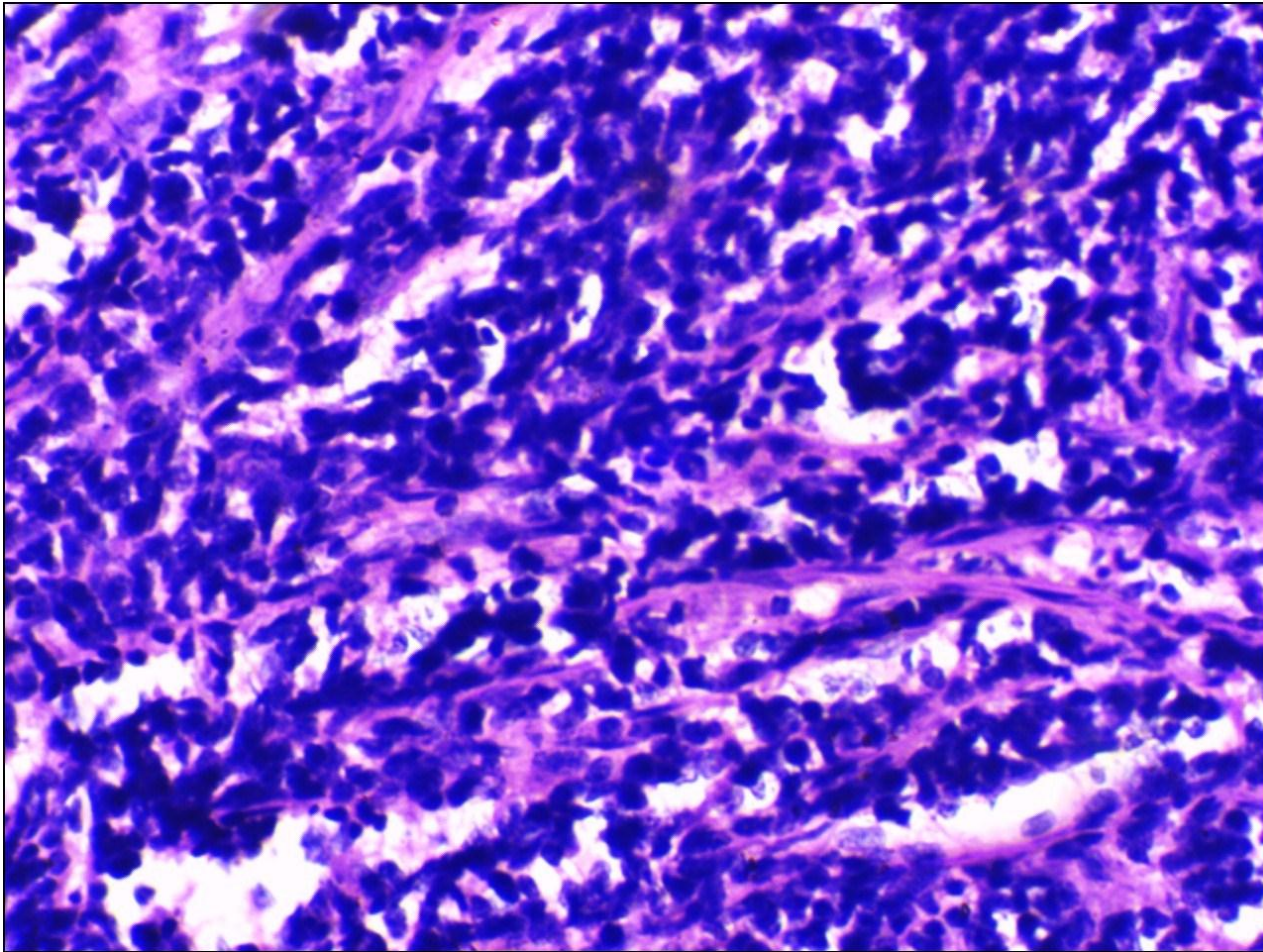
Microscopic Finding (H&E x 100)



Microscopic Finding (H&E x 400)



Microscopic Finding (H&E x 400)



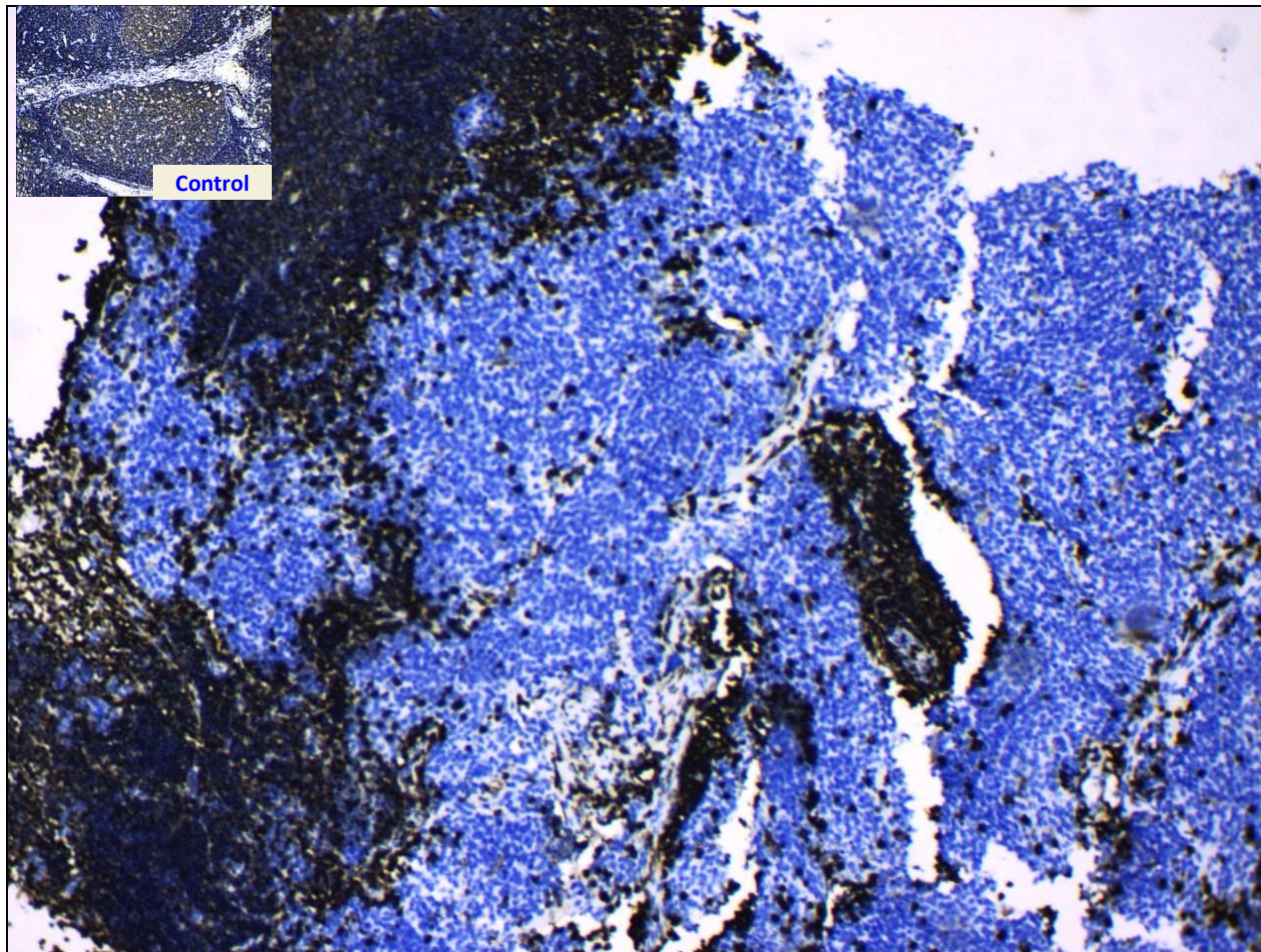
Histopathology Dx

- **Small blue round cell tumor**, right lung with metastasis into left supraclavicular lymph node
- **D/D**
 1. Neuroendocrine carcinoma
 2. Adenocarcinoma, small cell type with neuroendocrine differentiation
 3. Extra-skeletal Ewing's sarcoma/ PNET
 4. Malignant lymphoma
 5. Alveolar rhabdomyosarcoma

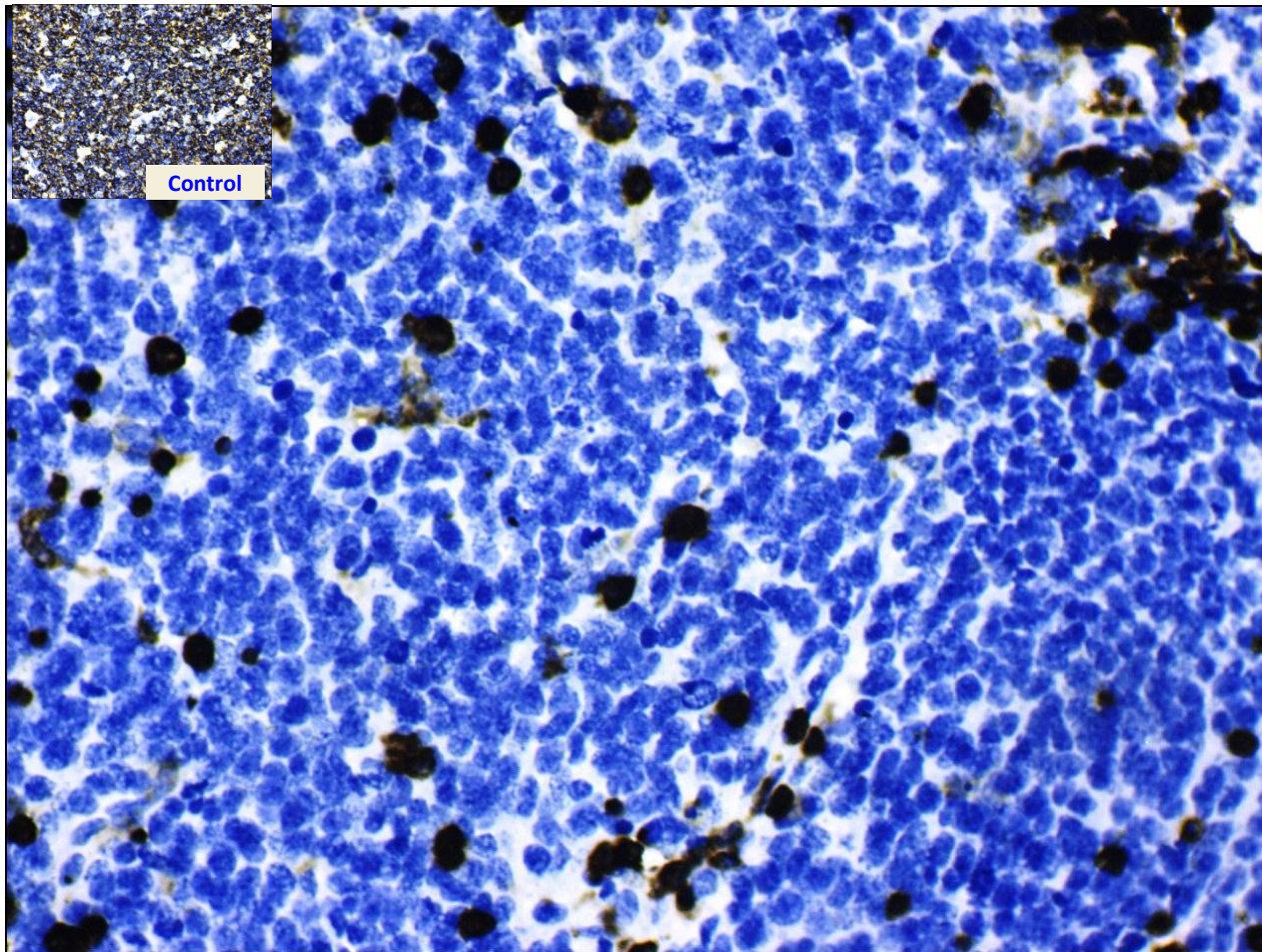
CHOICE & REVIEW OF IHC

IHC	Lymphoma	Ewing	Sarcoma	NET
LCA	+	-	-	-
CD 99	+/-	+	-	+/-
Vimentin	-	+	+	-
Synaptophysin	-	-	-	+
Chromogranin	-	-	-	+

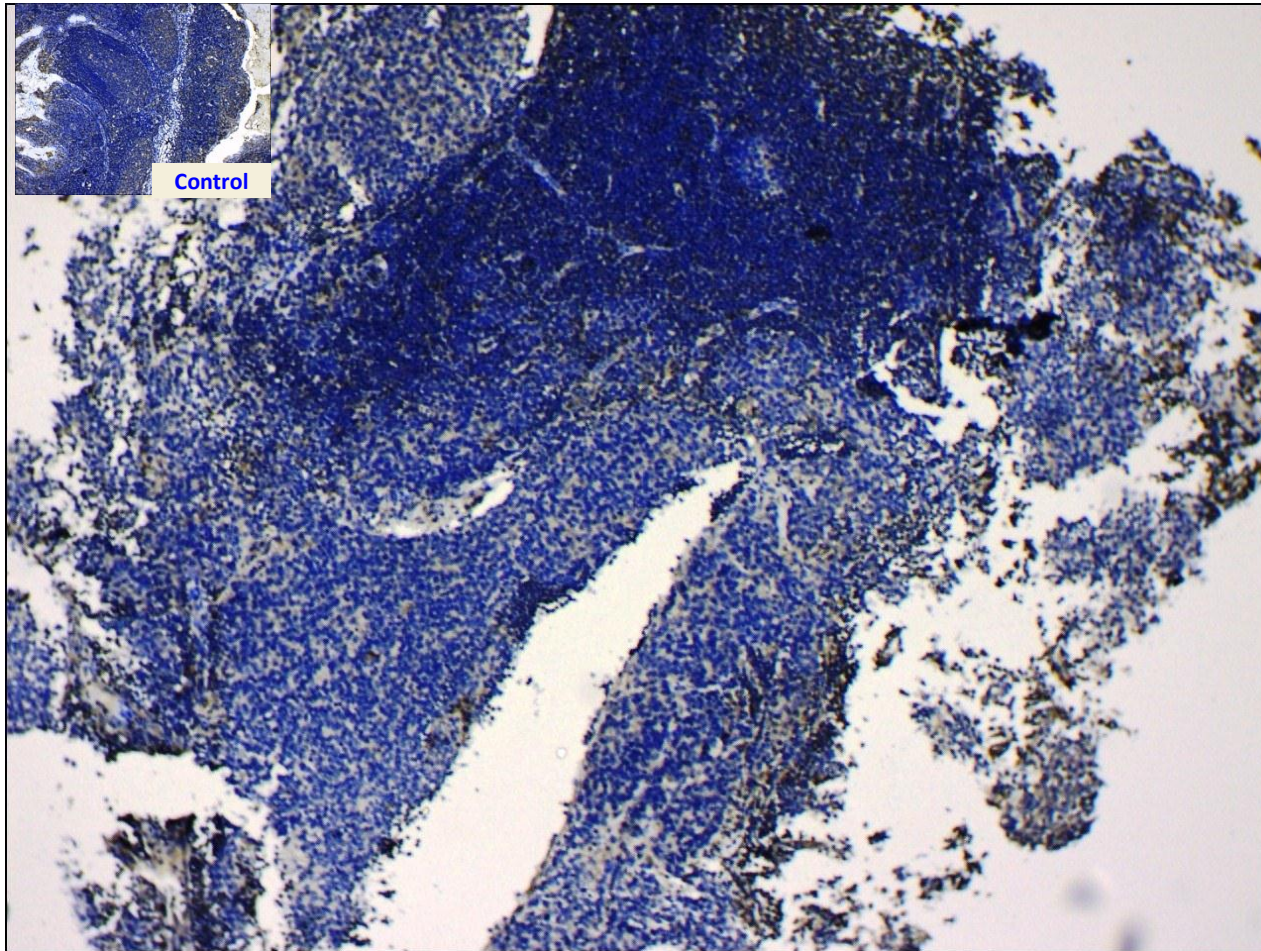
CD45 (LCA) x 100



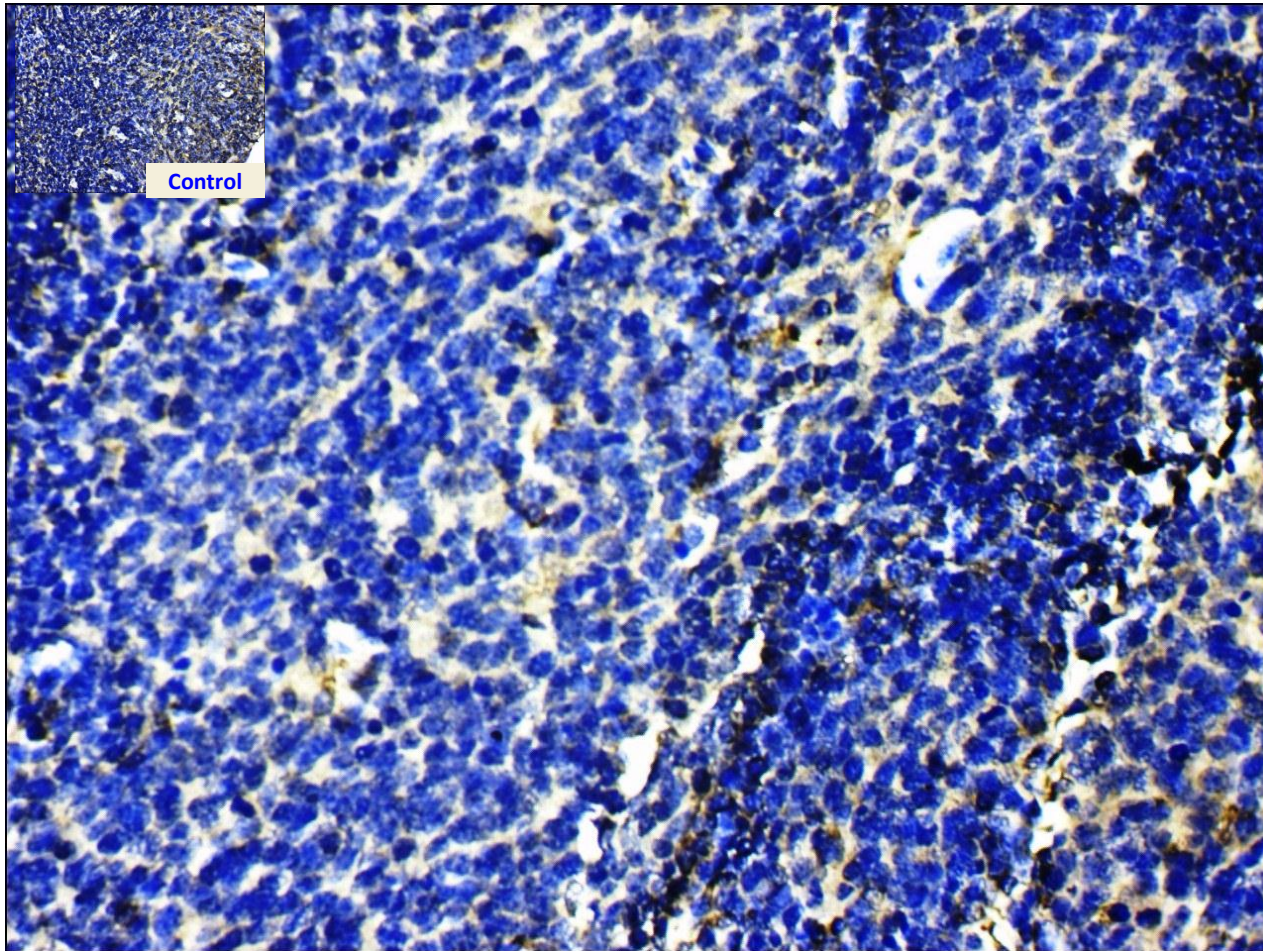
CD45 (LCA) x 400



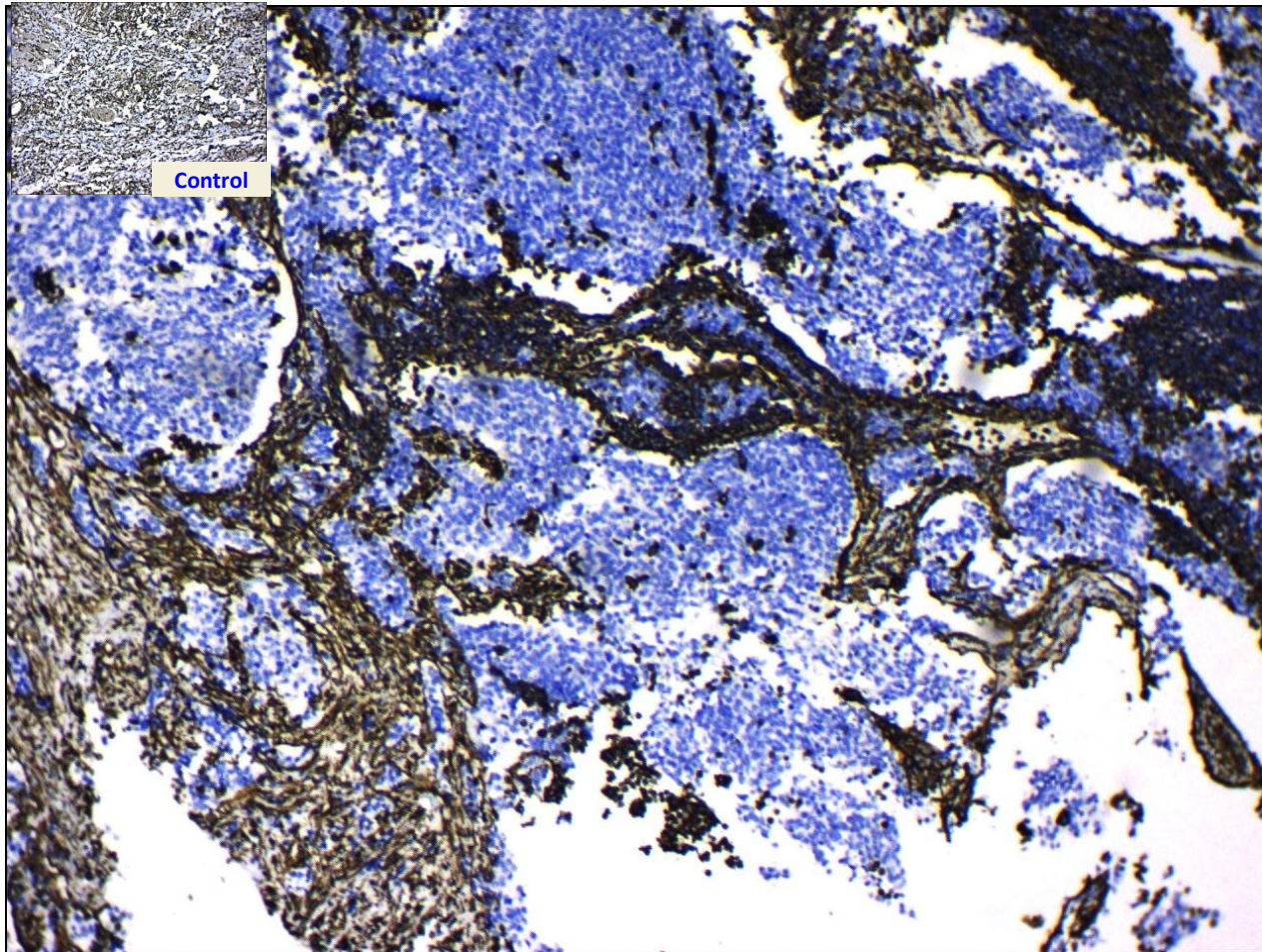
CD 99 x 100



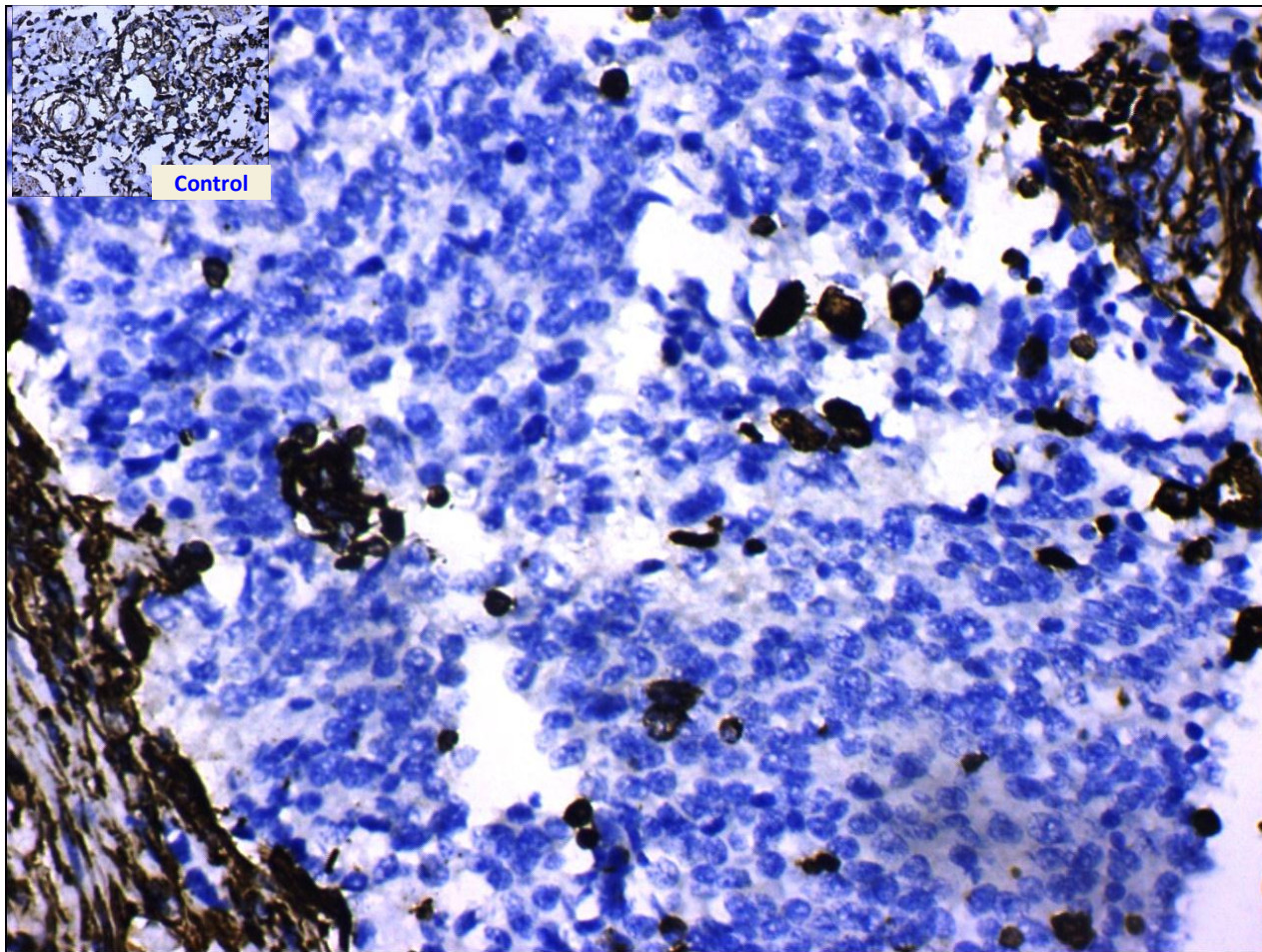
CD 99 x 400



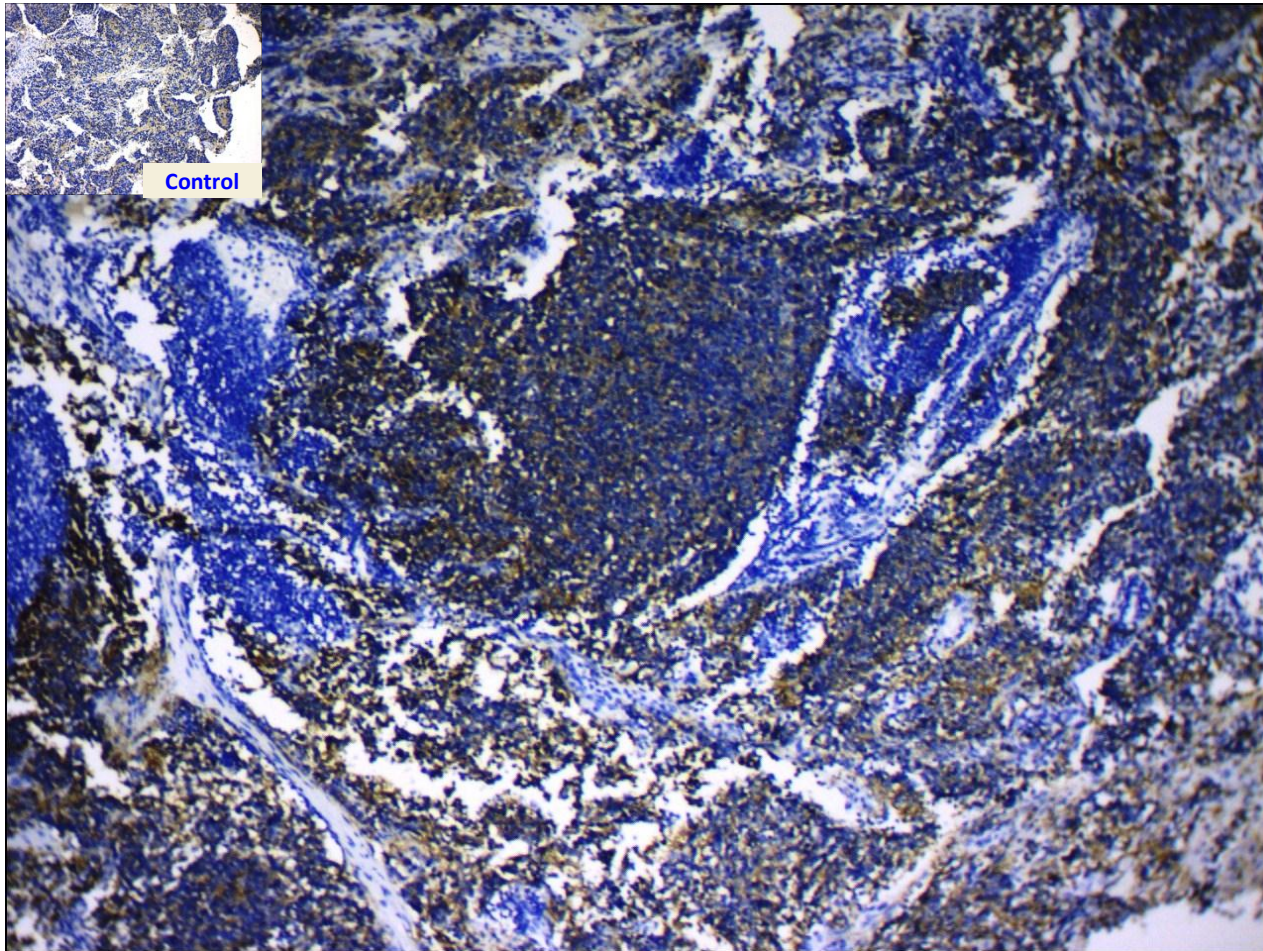
Vimentin x 100



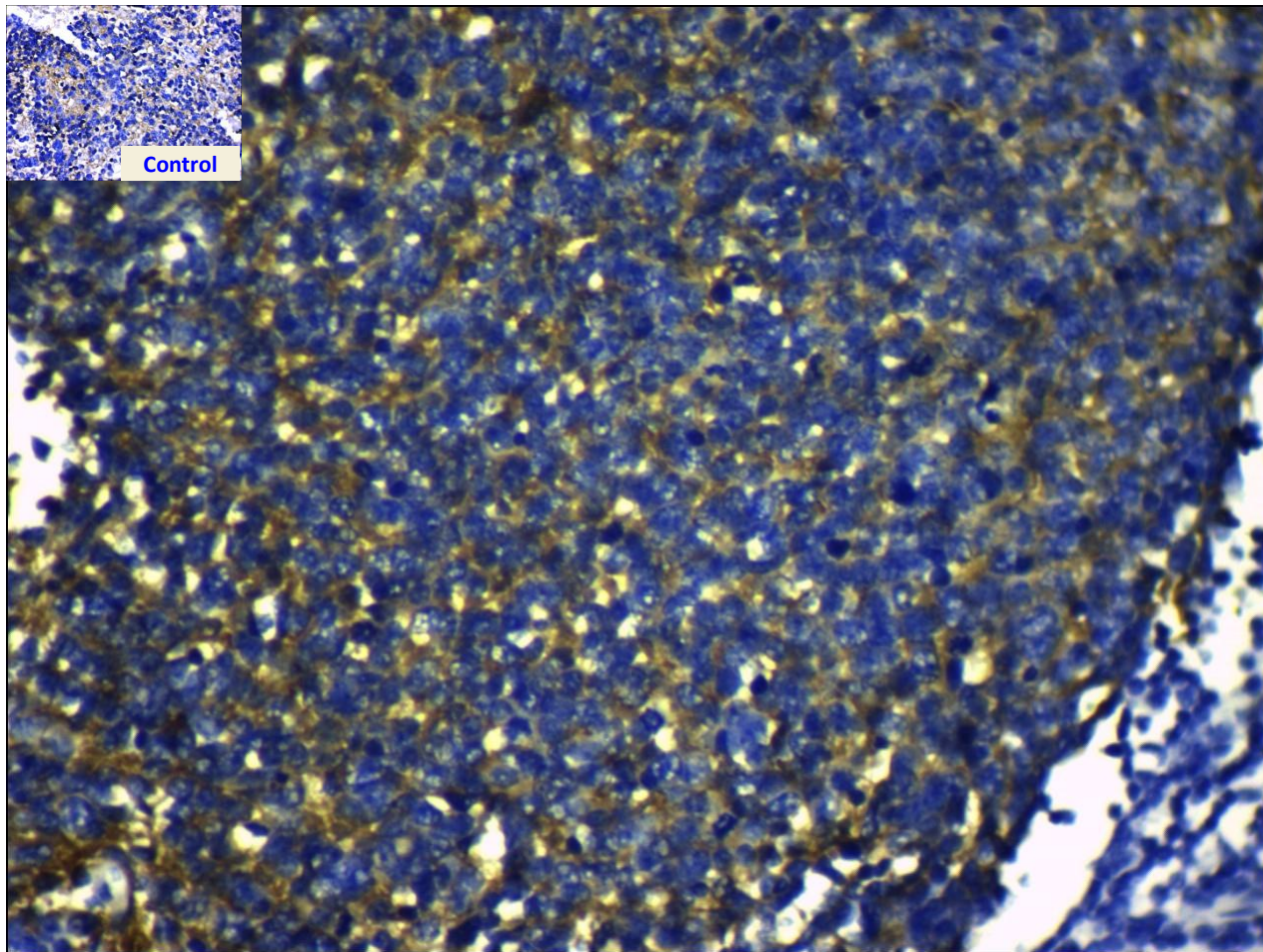
Vimentin x 400



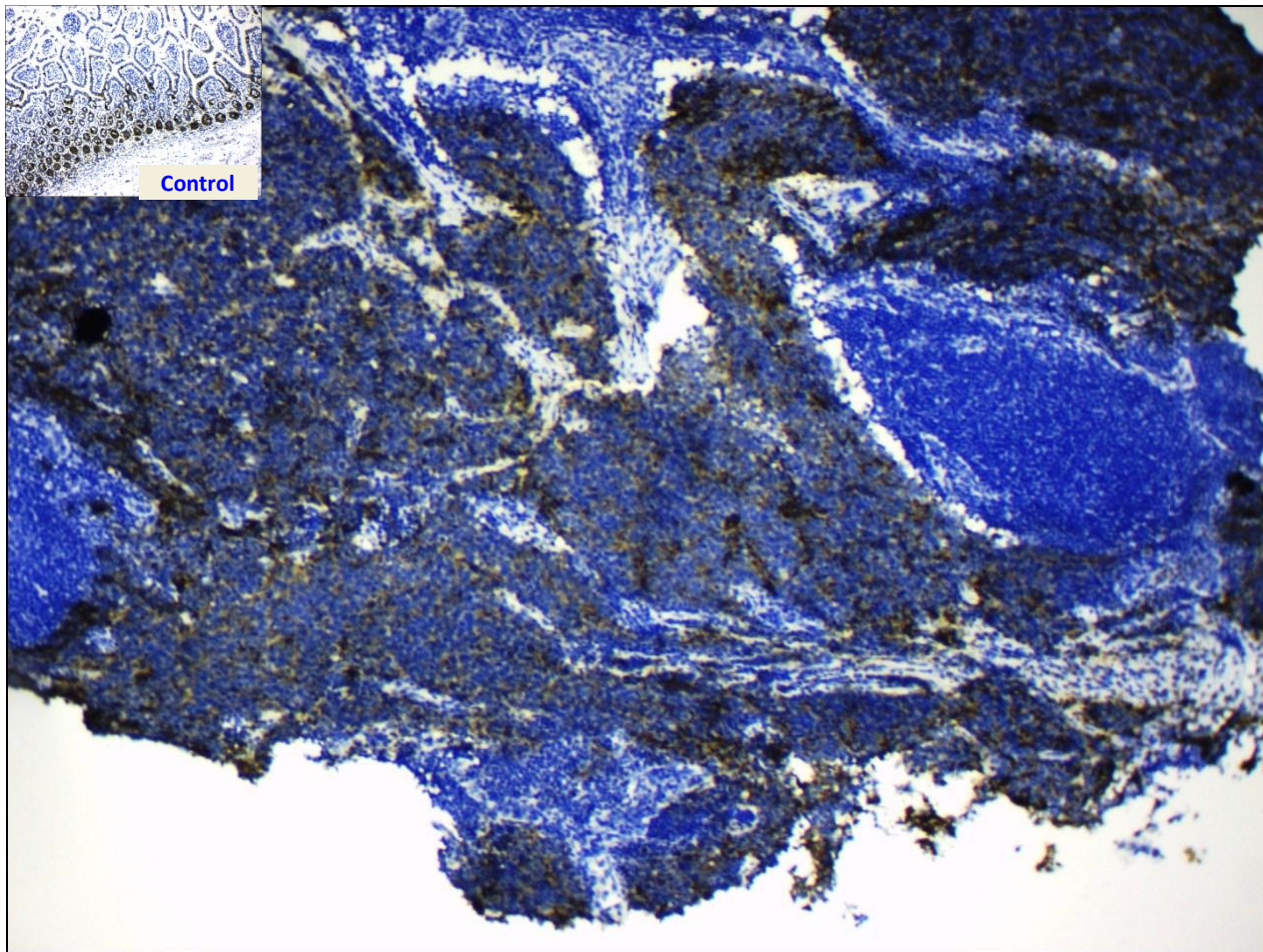
Synaptophysin x 100



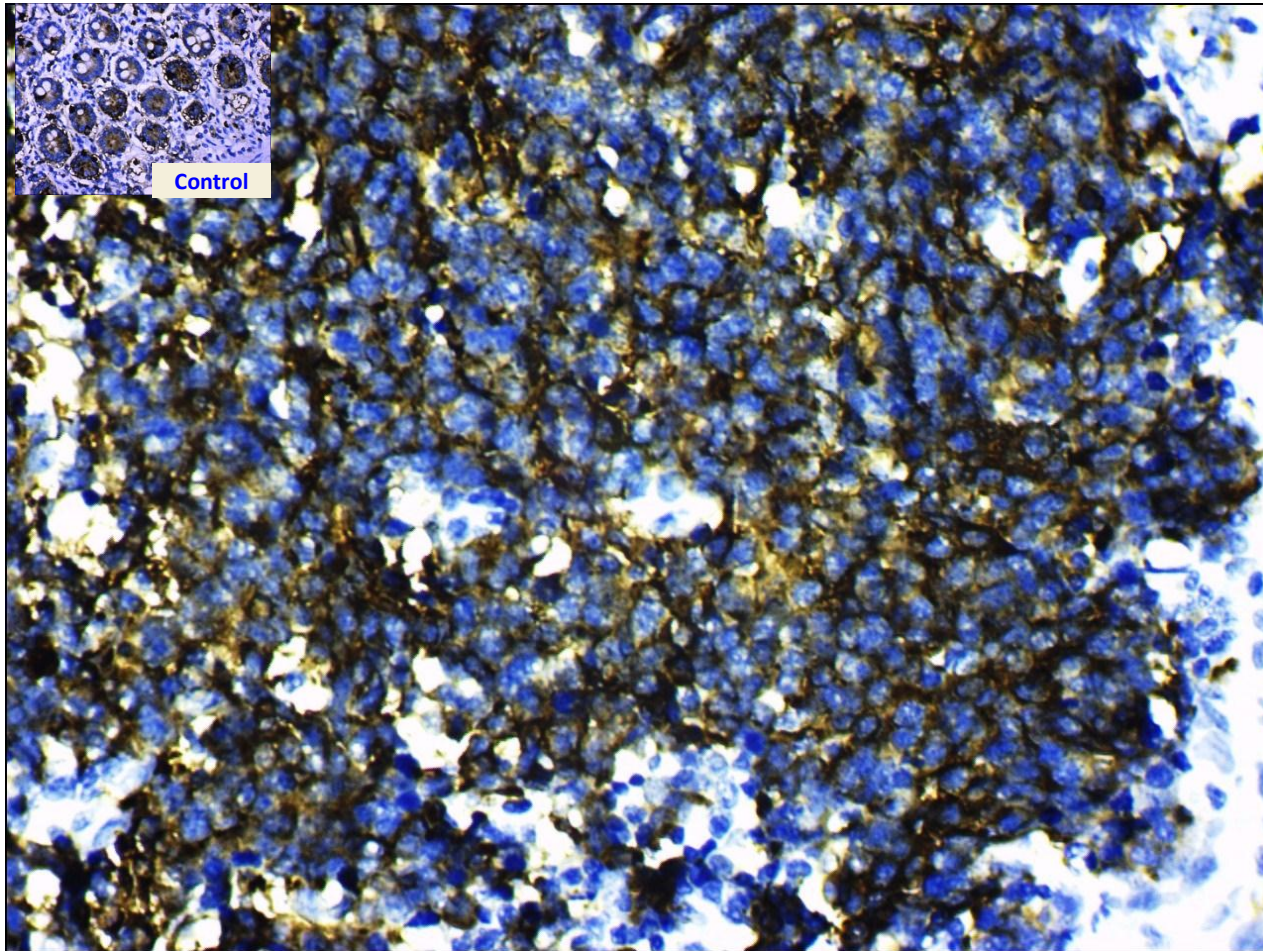
Synaptophysin x 400



Chromogranin A x 100



Chromogranin A x 400



IHC FINDINGS

IHC	Finding	Remarks / Probable Dx
LCA	-	Lymphoma is excluded
CD 99	-	Ewing's sarcoma is excluded
Vimentin	-	
Synaptophysin	+	Neuroendocrine tumour
Chromogranin	+	

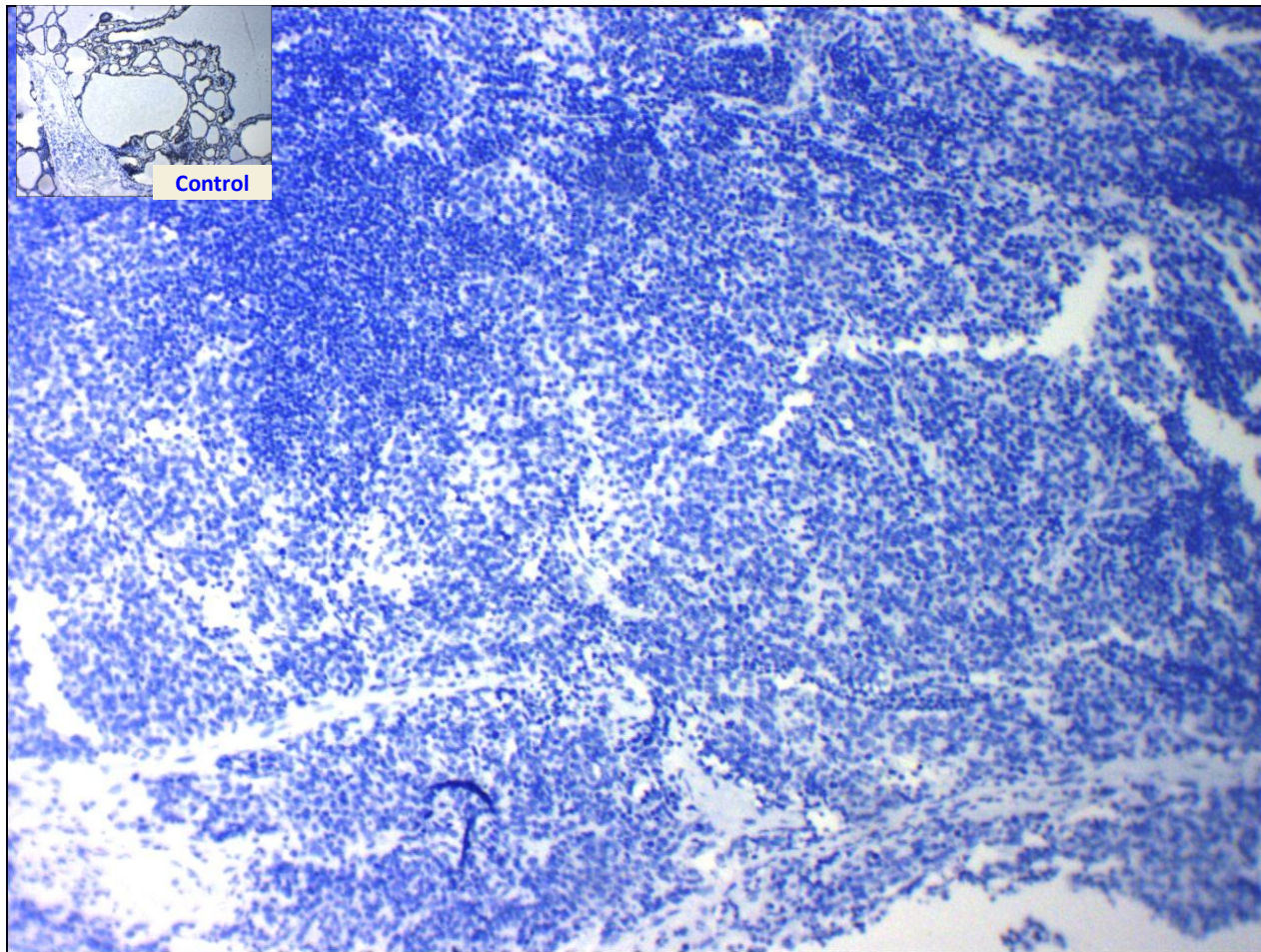
Two Possibilities

1. Carcinoid Tumour of Lung
2. Small Cell Carcinoma of Lung with Neuroendocrine Differentiation

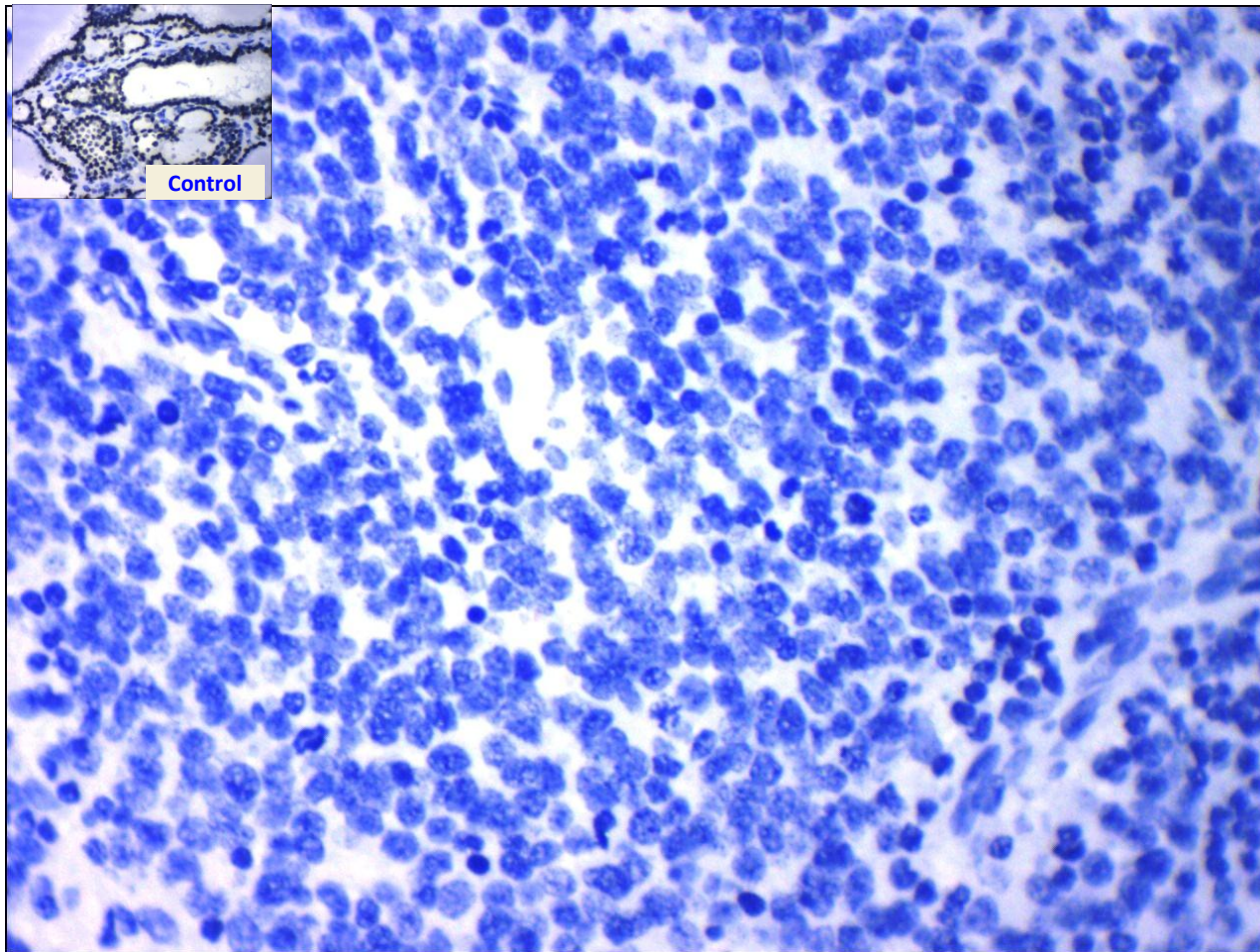
Carcinoid Vs Small Cell CA

IHC	Carcinoids	Small Cell CA
TTF-1	+/- (~30% +, weak)	90% +
CK	+/- (~80% +)	+ (dot-like)
SYN, CHR, CD56	+ strong, diffuse	+ usually weak, focal
Ki67	<2% in Typical Carcinoid <20% in Atypical Carcinoid	>>20%

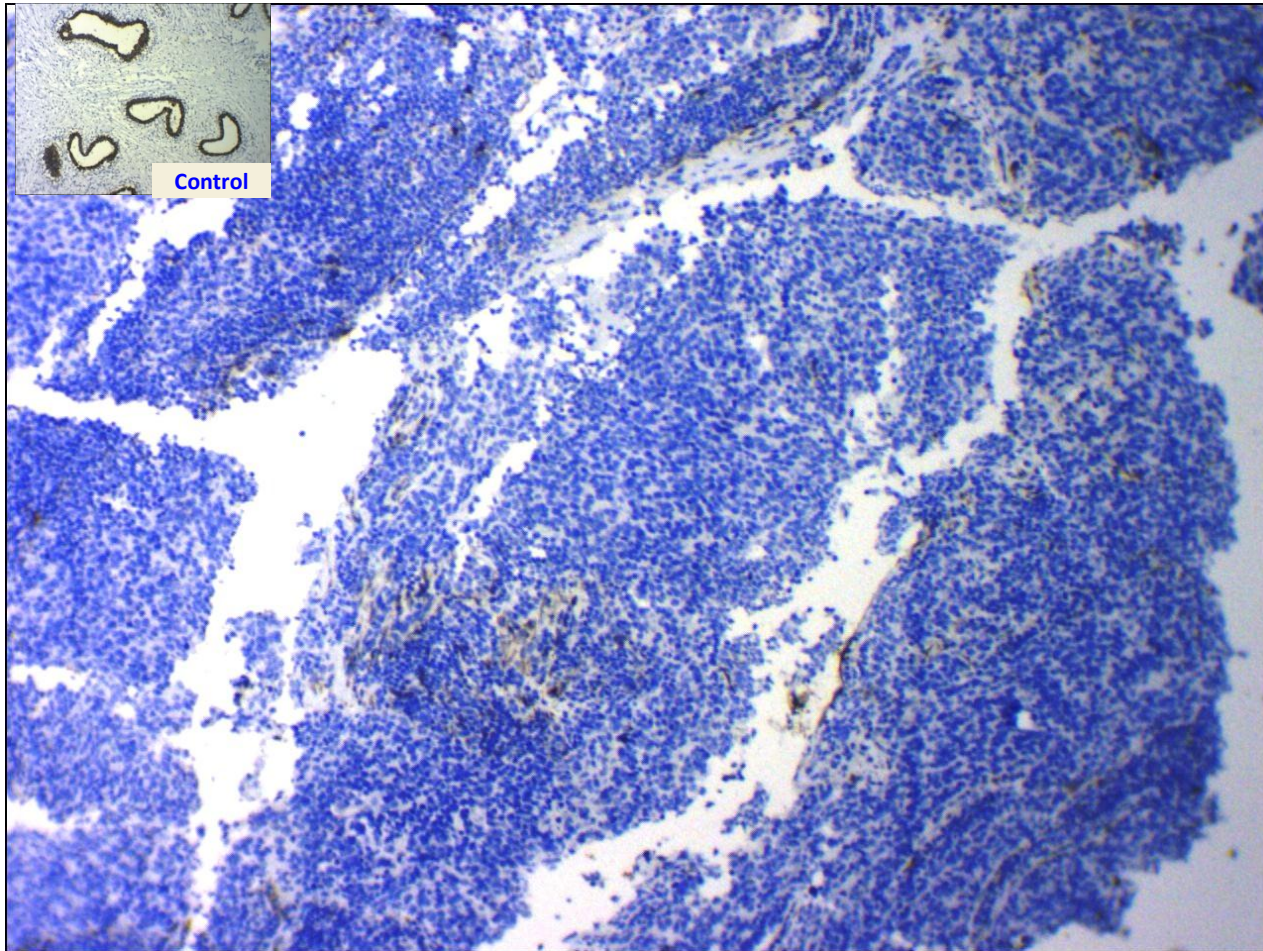
TTF 1 x 100



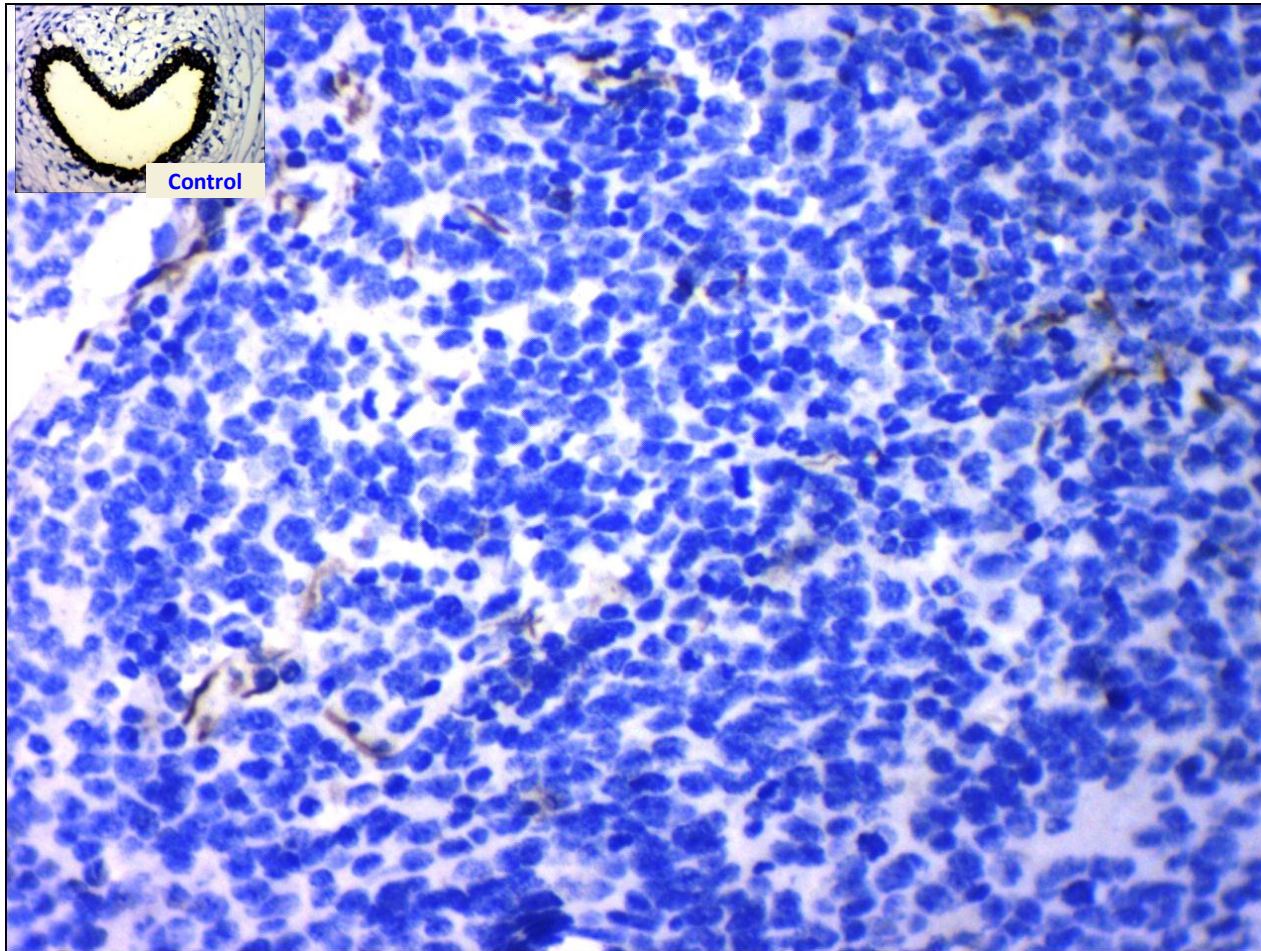
TTF 1 x 400



CK x 100



CK x 400



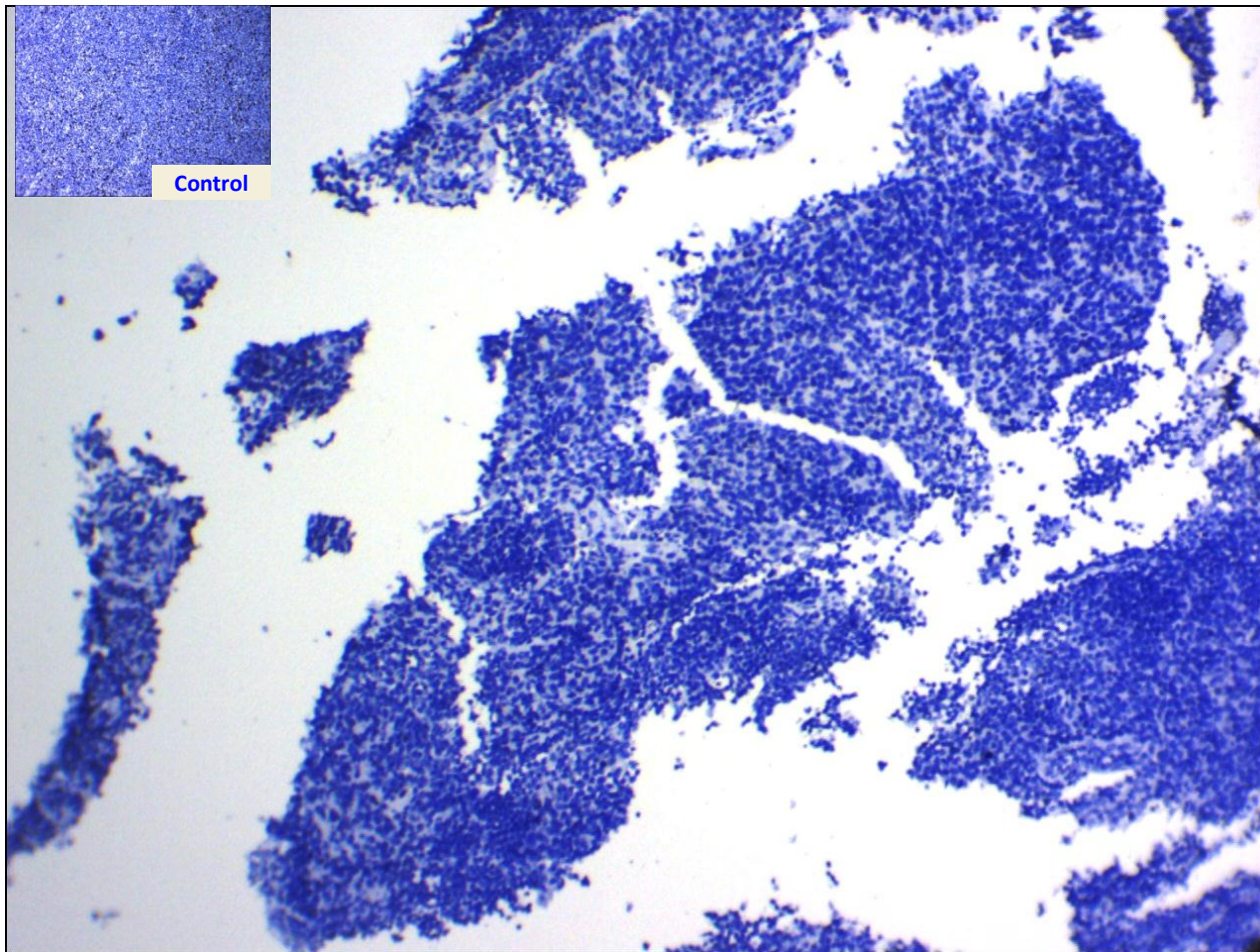
IHC FINDINGS

IHC	Finding
TTF 1	-
CK	-

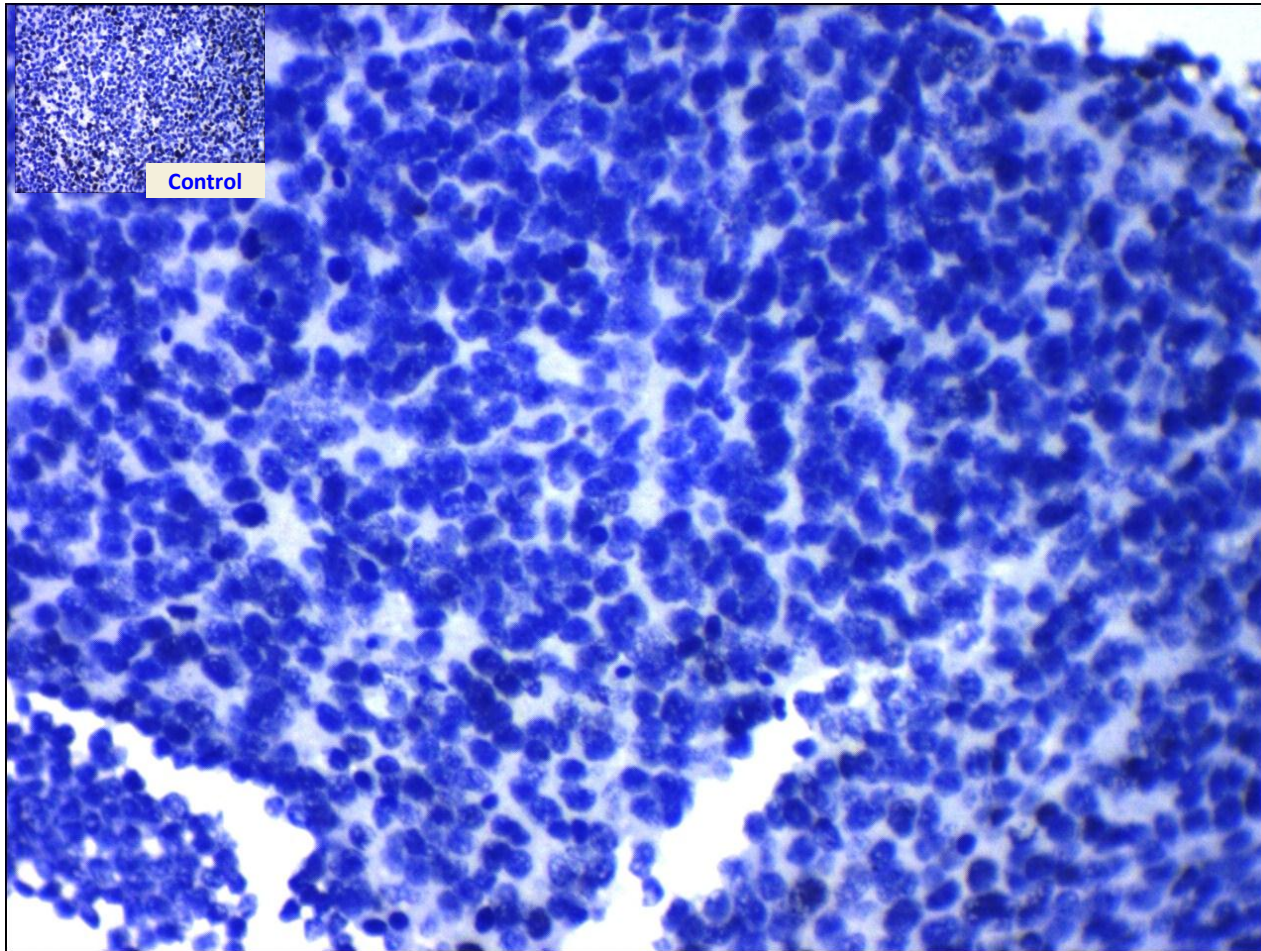
Carcinoid Vs Small Cell CA

IHC	Carcinoids	Small Cell CA
TTF-1	+/- (~30% +, weak)	90% +
CK	+/- (~80% +)	+ (dot-like)
SYN, CHR, CD56	+ strong, diffuse	+ usually weak, focal
Ki67	<p><2% in Typical Carcinoid</p> <p><20% in Atypical Carcinoid</p> <p>Dr Linn Zaw Win, Lecturer, UTM, MDY</p>	>>20%

Ki 67 x 100



Ki 67 x 400



Carcinoid Vs Small Cell CA

IHC	Carcinoids	Small Cell CA
TTF-1	+/- (~30% +, weak)	90% +
CK	+/- (~80% +)	+ (dot-like)
SYN, CHR, CD56	+ strong, diffuse	+ usually weak, focal
Ki67	<2% in Typical Carcinoid <20% in Atypical Carcinoid	>>20%

Final Diagnosis

- **Typical Carcinoid Tumor**, right lung with metastasis into left supraclavicular lymph node

Pulmonary atypical carcinoid tumor in a 15-year-old girl: a case report and review of the literature

Bita Geramizadeh,^{1,2} Hamid Reza Foroutan,³ Mansoureh Shokripour,² Amir Reza Dehghanian²

¹Transplant Research Center, ²Department of Pathology, ³Department of Pediatric Surgery, Shiraz University of Medical Sciences, Iran

Abstract

Primary pulmonary neoplasms in children are very rare, and because of their rarity, delays in diagnosis and treatment are common. Bronchial typical carcinoid accounts for 80% of primary malignant tumors, but, there are less than 40 proven cases in children reported in literature. Atypical carcinoids (AC) are the least common type of pulmonary carcinoids among children and to the best of our knowledge, less than 10

124/min; respiratory rate: 20/min; and temperature: 36.7°C. Heart examination was normal. There were decreased breathing sounds over the left lung. There was no wheezing or rales. Abdominal examination was normal with no organomegaly. Extremities were normal with no clubbing, edema or cyanosis.

Laboratory examination showed leukocytosis (WBC=16.4×10⁹/mL), hemoglobin was normal (Hb=12 gr/L) and erythrocyte sedimentation rate was 14.

With the clinical impression of pneumonia, a chest X-ray was performed; it showed lung infiltration and consolidation (Figure 1). Spiral computed tomography scan of the chest showed a small hypodensity in left main bronchus (Figure 2). According to this finding and the patient's vague history of foreign body ingestion, rigid bronchoscopy was performed which showed a small polyp like mucosal projection in left main bronchus, measuring 1×0.5 cm. The mass was excised by bronchoscopy. The patient had an uneventful postoperative course. The specimen in the pathology department received as a small nodule of about 1 cm with grey color and soft consistency. Microscopic findings showed bland looking epithelial to spindle shaped cells with mild atypia and

Correspondence: Bita Geramizadeh, Transplant Research Center, Department of Pathology, Shiraz University of Medical Sciences, P.O. box 71345-1864, Shiraz, Iran.
 Tel/Fax: +98.711.6474331
 E-mail: geramib@sums.ac.ir

Key words: pulmonary neoplasms, atypical carcinoid tumor, children.

Contributions: the authors contributed equally.

Conflict of interests: the authors declare no potential conflict of interests.

Received for publication: 8 March 2013.
 Revision received: 19 May 2013.
 Accepted for publication: 29 May 2013.

This work is licensed under a Creative Commons Attribution NonCommercial 3.0 License (CC BY-NC 3.0).

©Copyright Bita Geramizadeh et al., 2013
 Licensee PAGEPress, Italy
 Rare Tumors 2013; 5:e45
 doi:10.4081/rt.2013.e45

- 15 Yrs old girl
- C/O - cough & dyspnoea
- CXR - lung infiltration & consolidation
- CT - hypodensity in L. main bronchus
- Bx ; bland looking epithelial to spindle cells with mild atypia and nesting pattern separated by delicate fibrovascular stroma & rich in mitosis
- IHC ; CRN (+)
- Dx ; **Atypical Carcinoid**

Literature Review

- Carcinoid tumors are of **neuroendocrine** origin and derived from primitive stem cells in the gut wall, but they can be seen in other organs, including the **lungs**, mediastinum, thymus, liver, pancreas, bronchus, ovaries, prostate, and kidneys.
- While carcinoid tumors have a tendency to **grow slowly**, have a **high potential for metastasis**.

Literature Review

Carcinoid Incidence by Location

	Location	% of Patients
Foregut	Thymus	0.4%
	Lung, bronchi, trachea	29.8%
	Stomach	4.9%
Midgut	Small intestine	30.4%
	Gallbladder, pancreas	1%
Hindgut	Appendix	5.1%
	Colon, excluding appendix	9.2%
	Rectum	14.5%

Literature Review

- Neuroendocrine tumors are a unique **malignant neoplasm** that can arise from the respiratory tree.
- Well-differentiated bronchial NETs (carcinoid tumors) account for ~ **25%** of all NETs & represent only **1% to 2%** of all lung cancers.
- The epidemiology, clinical behavior, and treatment of NETs differ significantly from other lung malignancies.

Literature Review

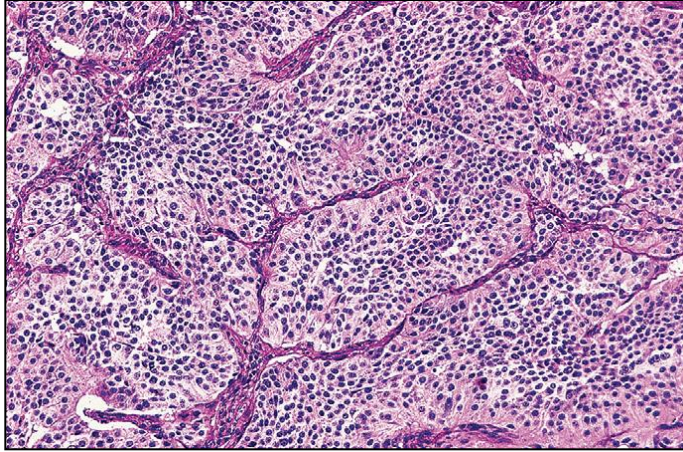
- According to histo-pathologic criteria (WHO 2004), carcinoids are divided into four groups;
 1. ***Typical* carcinoid (Grade 1)**
 2. ***Atypical* carcinoid (Grade 2)**
 3. **Large cell neuroendocrine carcinoma (Grade 3)**
 4. **Small cell lung carcinoma (Grade 3)**

Literature Review

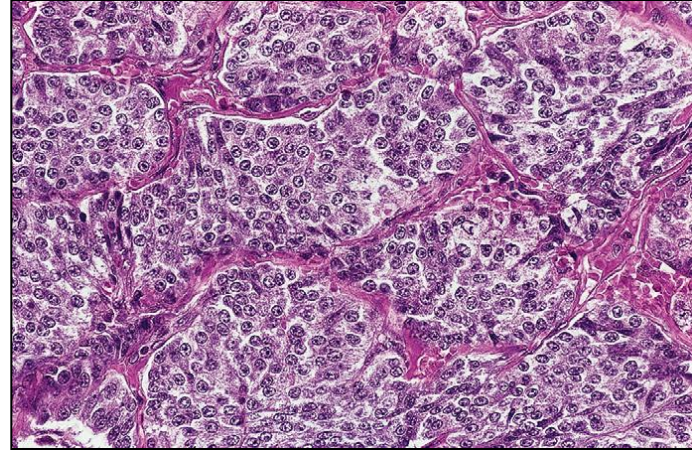
Histologic Criteria for Pulmonary Neuroendocrine Tumors

	Typical Carcinoid	Atypical Carcinoid	LCNEC	SCNEC
Mitoses	<2/10HPF	2-10/10 HPF	≥11/10 HPF; Median, 70/10 HPF	≥11/10 HPF Median, 80/10 HPF
Necrosis	—	+ (punctate)	+ (large zones)	+ (large zones)
Nuclear pleomorphism, hyperchromatism	Uncommon	Sometimes	Frequent	Small cells (pleomorphic cells are rare unless mixed SCNEC/LCNEC)
N/C ratio	Moderate	Moderate	Low	High
Nucleoli	Occasional	Common	Very common	Absent or inconspicuous
Nuclear chromatin	Finely granular	Finely granular	Usually vesicular, may be finely granular	Finely granular
Shape	Round, oval, spindled	Round, oval, spindled	Round, oval, polygonal	Round, oval, spindled
Nuclear smear	No	No	Uncommon	Common
Azzopardi effect*	No	No	Uncommon	Occasional

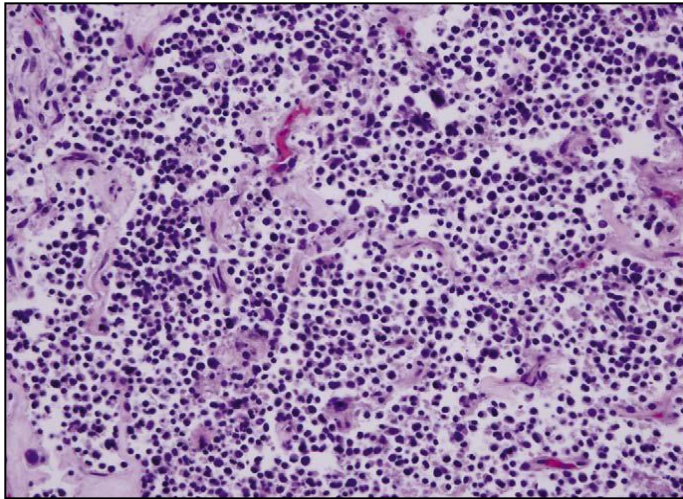
Literature Review



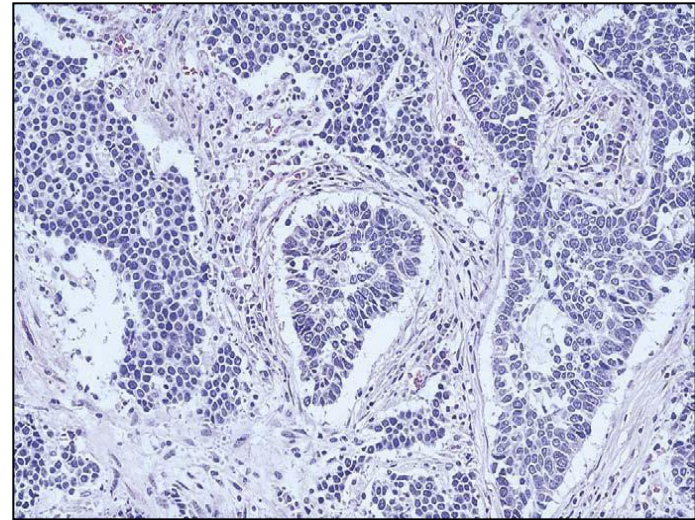
Typical Carcinoid



Atypical Carcinoid



Small Cell NET



Large Cell NET

Literature Review

- Associated with loss of heterozygosity at the **MEN1 gene** on chromosome 11q13.15,16
- **Del 11q** were identified in 66% of AC and 47% of TC tumors
- **Del 11q** was rarely identified in PD lung neuroendocrine cancers (both small and large cell)

Literature Review

- Survival is generally good
- 5-year survival rates : 44% to 97%
- AC is more aggressive and lower rates of survival than TC
(5 yr SR = 40% to 59% **Vs** 87% to 100%)
- Metastatic disease has a much poorer 5-year survival rate (14%-25%)
- SCNEC & LCNEC have worse Px.

Current Conditions

- Now in 3rd cycle of chemotherapy (Cisplatin & Etoposide).
- Relieved symptoms
- Mass (+) in recheck CXR but static.

References

- Bertino, E *et al*, 2009, 'Pulmonary Neuroendocrine/Carcinoid Tumors', *Cancer* 10:4434-4441.
- Geramizadeh, B 2013, 'Pulmonary Aypical Carcinoid Tumour in a 15 Year Old Girl: A Case Report and Review of Literature'. Retrieved January 19, 2018, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3804820/>
- Rekhtman, N & Bishop, JA 2011, 'Immunostains: Organ Systems. Thoracic', in Quick Reference Handbook for Surgical Pathologists, 1st edn, Springer, New York, p. 36.
- Rosai, J 2011, 'Respiratory Tract', in M, Houston & J, Scott (eds), Rosai and Ackerman's Surgical Pathology, 10th edn, Elsevier, Philadelphia, p. 386-390.
- Suster, S & Moran, CA 2009, 'Lung', in N, Weidner, RJ, Cote, S, Suster and LM, Weiss (eds), *Modern Surgical Pathology*, 2nd edn, Elsevier, Philadelphia, pp. 375-379.
- Tebbi, K *et al*, 2017, 'Carcinoid Tumours'. Retrieved January 19, 2018, from <https://emedicine.medscape.com/article/986050-overview?pa=hKmGoYK9EAEUfgbBpA5gk9DYlQ9suSyb5v8fGUqOUgP0OnTmvMT%2FFl8SmVbEAolHY%2BlzblvDTdhDfAVra6Zlqwf1%2FT5A0tgCo%2FGiWn3Mk%2BU%3D>



THANK YOU