

Initial Spontaneous Pneumothorax in Children and Adolescents: Operate or Wait?

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Background

- Primary spontaneous pneumothorax is when air escapes the lung into the pleural space
 - No underlying lung disease
 - Incidence: 3.4 per 100,000
 - 4:1 male to female ratio
- Can lead to circulatory and/or respiratory failure
 - 50-60% recurrence rate in children
- Treatment based on adult data
 - Thoracoscopy vs. medical management
 - Controversy regarding timing of surgery

Objective

- Among pediatric patients with spontaneous pneumothorax, does early surgical intervention result in lower recurrence rate when compared to medical management? If not, is there a particular group that would benefit from early surgical intervention?

Methods

Cohort Eligibility:

- ICD-9 codes- primary spontaneous pneumothorax
- 5-19 year old age group
- 2002-2014 at a single center

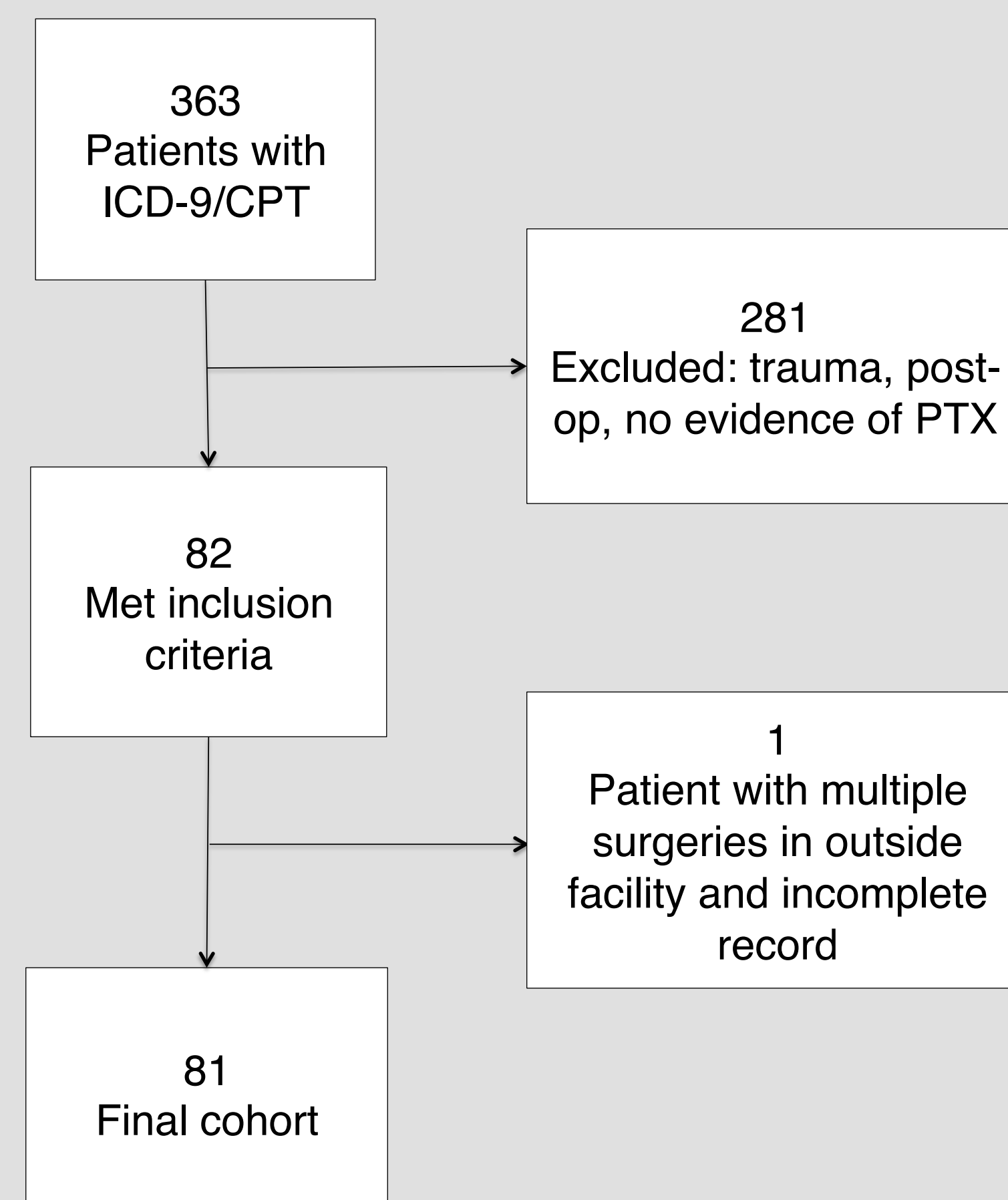
Data Collection:

- Retrospective chart review
- Electronic database created
- Collected data on pre hospital, hospital, and post hospital course
- Data de-identified and coded for analysis

Analysis:

- Data analysis software: Minitab
- t Test for continuous variables
- Chi-squared for categorical variables
- Cohort split into recurrent and non recurrent group

Patient Identification/Selection:



Results & Conclusions

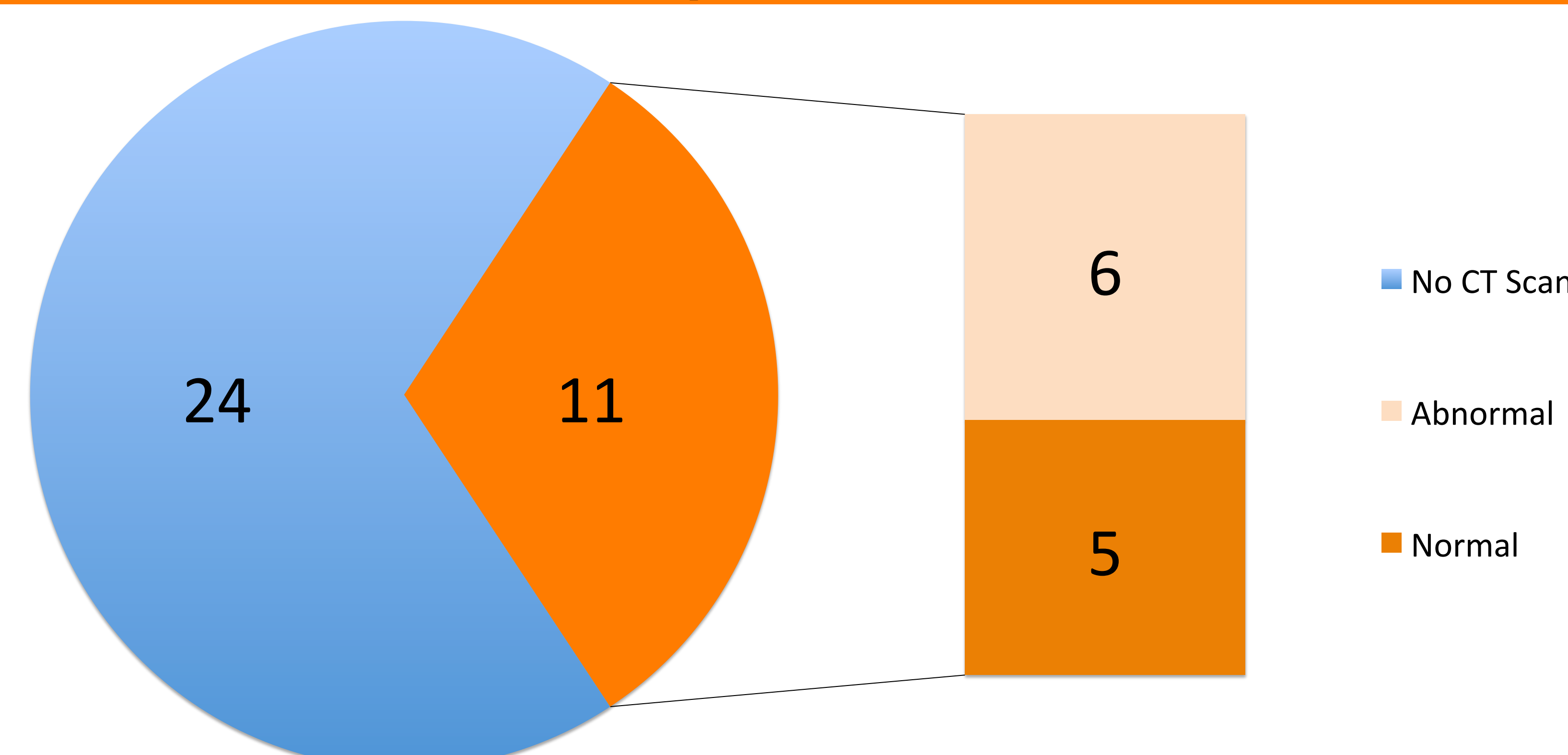
Demographic Overview of Study Cohort

	Overall Cohort
Age (mean [standard deviation] in years)	17.1 [2.6]
Gender	
Male	61
Female	20
Race	
Caucasian	37
African American	5
Asian	4
Unknown	35
Height (mean [standard deviation] in meters)	1.7 [0.2]
Weight (mean [standard deviation] in kilograms)	57 [11.6]
BMI (mean [standard deviation] in kg/m ²)	18.9 [2.9]
Insurance Status	
Private	23
Medicaid	14
No Insurance on file	45

Characteristics of Patients Based on Recurrence

	Non recurrent (n=45)	Recurrent (n=36)	p-value
Age (years)	16.61	17.67	0.05*
Height (meters)	1.69	1.77	0.02*
BMI	19.20	18.70	0.46
LOS (post-op)	7.90	7.40	0.94
Chest tube used	46.70	38.90	0.51
'Moderate to large' size PTX (%)	46.70	38.90	0.51
Thoracoscopic Surgery (%)	24.40	5.60	0.03*
Chest CT scan (%)	40.00	30.60	0.37

CT Scan Use in Recurrent Group



Summary of Major Findings

- 362 cases of pneumothorax in children were found
 - 81 met the inclusion criteria for PSP
- An overall recurrence rate of 44.4%
 - 89% recurred within 12 months of the initial PSP
- Recurrent PSP cases were older and taller
- Both groups were similar in the use of chest tubes, and in the proportion of initial CXR reporting moderate or larger pneumothorax
- CT scan use was not significantly different between groups
 - 5/6 CT scans read as 'normal' had recurrence
- Thoracoscopic surgery resulted in a significantly lower rate of recurrent PSP
- Patients who did not undergo surgery had a 50% recurrence rate
 - 90% of which recurred within 12 months of the initial PSP.

Limitations

- Single center study
- Limited cohort size
- Possibility of patients having a recurrence and receiving treatment at other facility
- Tertiary care center that may have resulted in more complex patients due to referral or transfers

Conclusions

- Recurrence after PSP in children and adolescents was high
 - majority occurred within a year
- CT scans were not useful in predicting higher risk patients
- Initial thoracoscopic blebectomy and pleurodesis had significantly lower recurrence.
- These data may suggest a more aggressive surgical approach to initial PSP in children, and limit use of CT scan