

ABSTRACT

Objective:

Follicular tracheitis (also known as tracheal cobblestoning) is an entity that is poorly described and of unclear significance. The objective of this study was to better define follicular tracheitis and determine the association between the clinical finding of follicular tracheitis on bronchoscopy and objective evidence of GERD on esophagoscopy and/or pH-probe study.

Methods:

Retrospective study of children with recurrent croup having undergone a rigid bronchoscopy and flexible esophagoscopy with biopsies at a single pediatric tertiary care institution between 2001-2013.

Results:

117 children with recurrent croup children age 6-144 months were included in the study. Follicular tracheitis was noted on 41% of all bronchoscopies. 43% of all children had an abnormal esophagoscopy. 49 of 117 children underwent a pH probe study and 51% were found to have evidence of reflux on this study. 9 children were diagnosed with eosinophilic esophagitis. Three patients underwent a biopsy of the follicular tracheitis lesions, which revealed chronic inflammation. There was no evidence of an association between findings of follicular tracheitis and a positive pH probe study ($p=0.64$) or an abnormal esophageal biopsy ($p=0.47$). There was no association between follicular tracheitis and subglottic stenosis ($p=0.33$), history of asthma ($p=0.33$) or atopic disorder ($p=0.82$).

Conclusion:

In children with recurrent croup, follicular tracheitis remains an unspecific finding associated with an inflammatory disorder of unknown etiology. Further studies are needed to determine if it may be associated with pulmonary aspiration

WHAT IS FOLLICULAR TRACHEITIS?

- Common finding on pediatric bronchoscopy (32-39% prevalence)
- It has previously been shown to be more common in older children (>3 years old)
- Small (usually <5mm) raised nodules that may be found throughout the trachea and bronchus
- May be limited or diffuse throughout the airway
- Pathologic findings: consistent with chronic inflammation
- Unknown significance & etiology

OBJECTIVES

- Characterize follicular tracheitis in children having undergone a diagnostic bronchoscopy for recurrent croup
- Determine whether follicular tracheitis is associated with objective findings of gastroesophageal reflux on esophagoscopy, pH probe testing or upper gastrointestinal radiologic study.

METHODS

Retrospective review of children having undergone a rigid bronchoscopy for recurrent croup

Inclusion criteria:

- Children age 1-18 years old having undergone a rigid bronchoscopy and investigations for gastroesophageal reflux disease between 2001-2013 at a tertiary care pediatric institution

Exclusion criteria:

- Known underlying airway anomaly diagnosis
- Persistent stridor at rest
- No rigid bronchoscopy or investigation for gastroesophageal reflux disease done

Variables evaluated included findings on bronchoscopy, esophagoscopy and/or other investigations for gastroesophageal reflux, age, gender and past medical history.

Three main outcomes were evaluated:

- Description of characteristics of patients with follicular tracheitis
- Association between follicular tracheitis and gastroesophageal reflux disease
- Association between bronchoscopic findings suggestive of gastroesophageal reflux and investigations for this condition

RESULTS

Follicular tracheitis was present in 96/235 (41%) of children having undergone a rigid bronchoscopy for recurrent croup.

A total of 117 children met inclusion criteria

Investigations for GERD included:

- Esophagoscopy with biopsy (110)
- pH probe (49)
- Upper gastrointestinal radiographic series (14)

The prevalence of follicular tracheitis was 48/117 (41%).

The prevalence of GERD on testing was 69/117 (59%).

Nine (8%) children were diagnosed with eosinophilic esophagitis.

There was no evidence of an association between an history of atopy or asthma and follicular tracheitis. There was no evidence of an association between an history of atopy ($p=0.82$) or asthma ($p=0.33$) and follicular tracheitis.

There was evidence of an association between finding of follicular tracheitis and arytenoid edema on rigid bronchoscopy ($p=0.05$).

There was no association between follicular tracheitis and a confirmed diagnosis of GERD. ($p=0.52$)

There was no association between arytenoid edema/erythema and a confirmed diagnosis of GERD. ($p=0.46$)

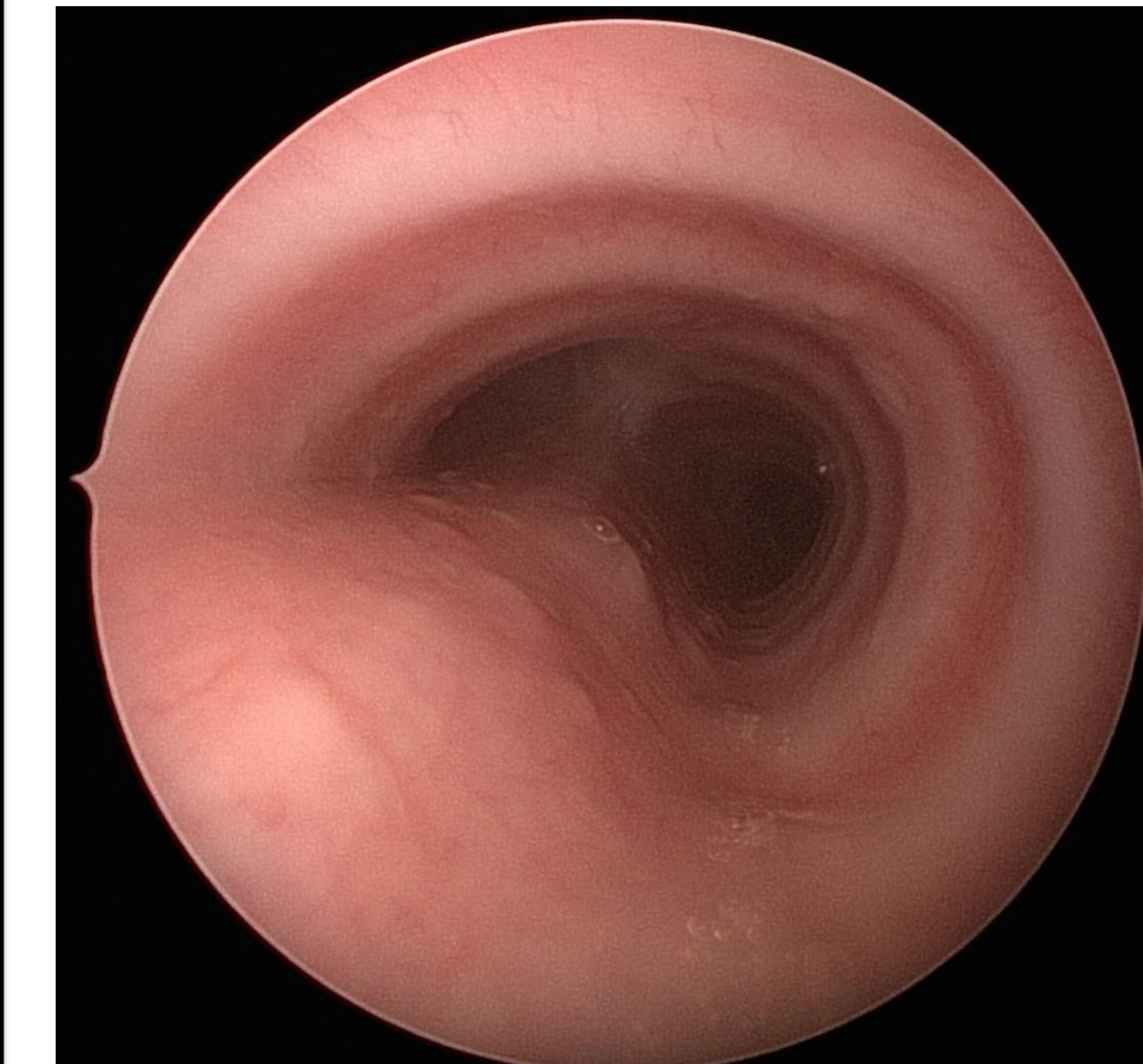
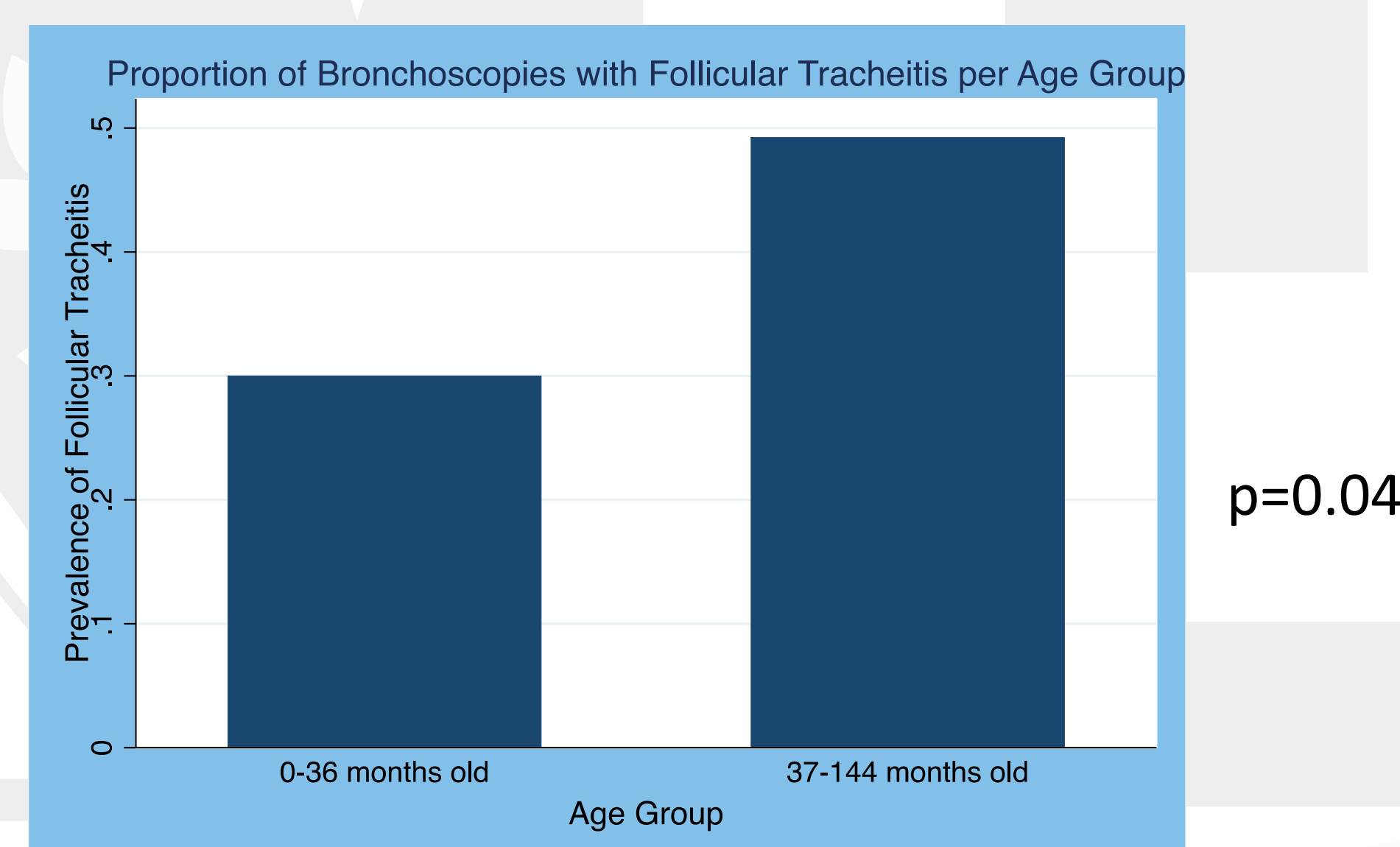


Figure 2a: Follicular tracheitis in trachea

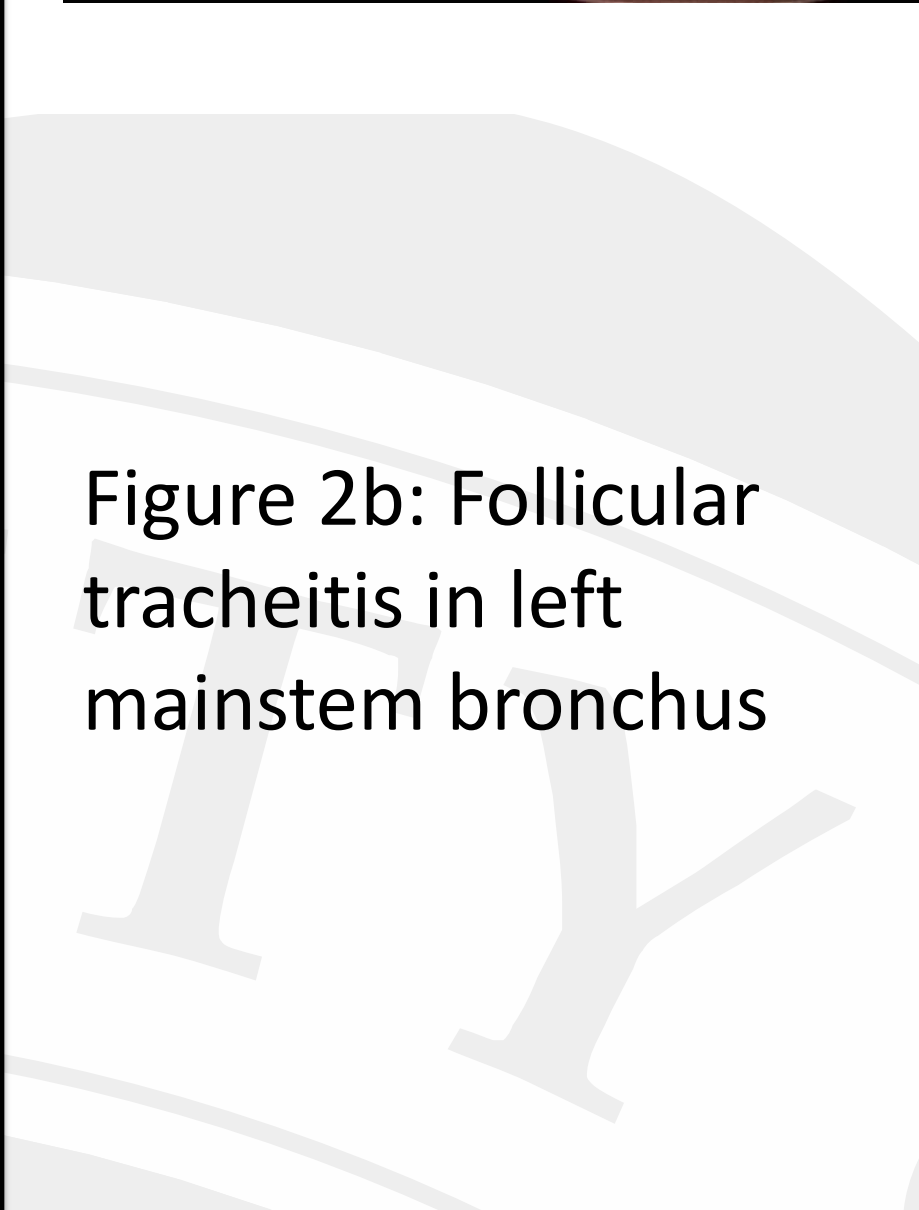


Figure 2b: Follicular tracheitis in left mainstem bronchus

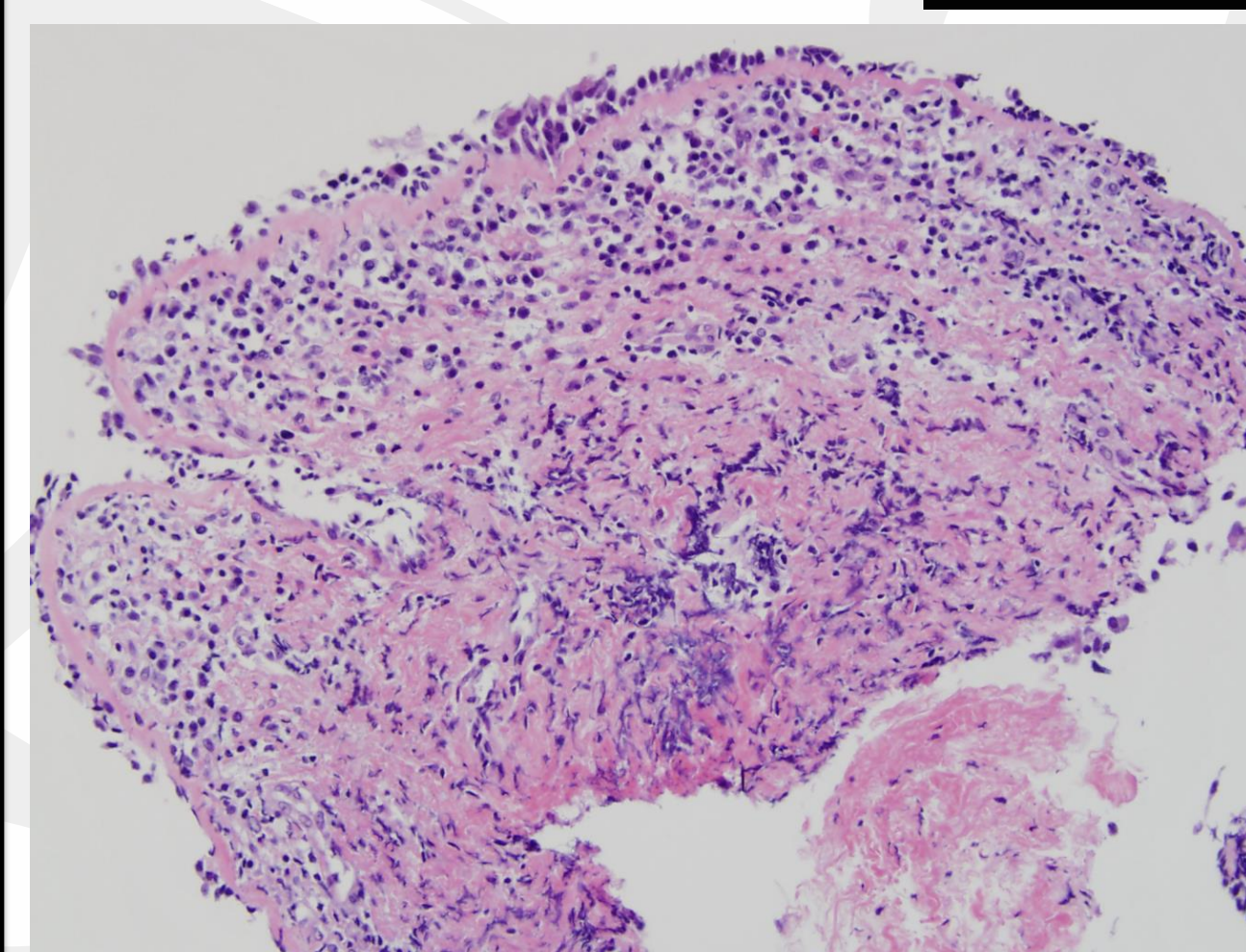


Figure 2c: Pathology slide of the lesion showing changes consistent with non specific chronic inflammation (H&E, 20X)

CONCLUSIONS

- Follicular tracheitis is a common finding on pediatric bronchoscopy in both healthy children and children with recurrent croup.
- Follicular tracheitis appears to represent non-specific chronic inflammation of the lower airway.
- Interestingly, there was an association with arytenoid edema which has not previously been reported.
- There is no evidence of an association between follicular tracheitis and GERD.

REFERENCES

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