All that wheezes is not asthma

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Subject

• 33 yo F presented for elective Roux-en-Y gastric bypass
• 4’11”, 117 kg (BMI 50 kg/m²)
• Never had GA

PMH

• Wegener Granulomatosis
  – Followed by ENT as outpatient
  – Treated with prednisone, azathioprine
• Mild Intermittent Asthma
  – Followed by primary care (internist) as outpatient
  – Treated with mometasone and PRN albuterol
  – Uses albuterol 1-2x per week
10 years prior to surgery

- Recurrent episodes of sinusitis
  - Tx with multiple antibiotics
- CT scan demonstrated destruction of her ethmoid sinuses
- ENT consulted and followed patient
- Biopsies showed non-specific acute and chronic inflammation
- No evidence of granulomatous changes, necrosis or vasculitis
- Serum positive for proteinase 3
  - Dx with Wegener Granulomatosis

After Diagnosis.....

- She continued to experience chronic bronchitis and rhinosinusitis
- Serial CT scans of chest and sinuses were interpreted as normal or no change
- Continued Tx with prednisone and azathioprine
2 years prior to surgery

- Patient became pregnant
- Post-pregnancy complicated by significant weight gain
- Patient began experiencing wheezing
  - Spirometry performed by patient’s internist
    - Mild-flattening of expiratory limb of flow-volume curve
    - Improved after bronchodilator tx
  - Dx with asthma
    - Placed on mometasone and albuterol inhalers

3 months prior to surgery

- Referred for bariatric surgery clinic at Stanford due to weight gain
- Patient stopped azathioprine and prednisone without medical advice
Pre-operative evaluation

• Otherwise unremarkable with the following exceptions
  – Patient reported SOB with minimal exertion
  – She reported that her asthma is exacerbated by exercise
    • Symptoms responsive to PRN albuterol (uses 1-2x per week)
    • No recent hospitalizations

Physical Exam and Pre-Op Tests

• Morbidly Obese female in no acute distress
• Able to speak and walk from bathroom to gurney without SOB
• No audible wheezes however mild wheezing heard in all lung fields on ascultation
• SpO2 99% on room air
• Labs unremarkable except for a mild anemia
• CXR interpreted as normal by radiologist
Proceed with case.....

- Patient with h/o Wegeners Granulomatosis and Asthma presents for RYGB
- Generally unremarkable pre-op subjective and objective
- Patient had been followed by ENT
  - Pre-operative CT scans unremarkable
  - No current symptoms of sinusitis
  - No audible wheezing/stridor
  - No SOB/distress
- Patient had been followed by medicine
  - Asthma symptoms relatively controlled
  - CXR normal
  - Spirometry completed
- No other alarming symptoms

Pre-op to OR

- Placed an 18G PIV in Right UE
- Brought patient to OR suite
- No midazolam premedication as per protocol
- Patient moved self from gurney onto OR table
Pre-induction

- Patient placed in head elevated laryngoscopy position
- Pre-oxygenated for 6-8 minutes
- Standard monitors (EKG, pulse oximetry, NIBP, capnography)
- Induction of anesthesia (RSI with cricoid pressure)
  - 3 mcg/kg LBW fentanyl
  - 2.5 mg/kg LBW propofol
  - 1 mg/kg TBW succinylcholine

Laryngoscopy and Intubation

- DL x1 by resident
  - MAC 3 blade
  - CL view 3
  - 7.0 ETT placed but could not be advanced through cords
• DL x2 by resident
  – MAC 3 blade
  – CL view 3
  – Gum elastic bougie placed through cords
    • confirmation via tracheal ring “clicks”
  – 7.0 ETT advanced over gum elastic bougie
  – Confirmation via capnography, symmetric chest rise and auscultation

5-10 minutes after Intubation

• Decreased tidal volumes
• Significant gas leak
• Examination with Glidescope
  – Herniation of cuff above vocal cords
5-10 minutes after Intubation

- Attempt to re-intubate using Glidescope and 7.0 ETT unsuccessful
- Gum-elastic bougie placed through cords
- 7.0 nor 6.0 ETT could not be advanced through vocal cords
Examination with Fiberoptic bronchoscope

- LMA introduced and used to ventilate lungs while a FOI was introduced
  - Subglottic stenosis was noted and ENT was called
- ENT performed fiberoptic-aided exam
  - Subglottic stenosis originating 6 mm below the vocal cords and extending 2 cm down the trachea was observed
What Next?

• Patient would require a laser excision of subglottic stenosis in very near future
  – A secure airway would be necessary during this procedure
  – Also concern for supraglottic edema secondary to airway manipulation
• ENT and MIS teams discussed plan with patient’s husband who was in agreement and consented patient for emergent tracheostomy

• ENT performed a tracheostomy
  – 4.0 mm ID un-cuffed cannula inserted
• Planned RYGB was cancelled
  – Patient brought to PACU in stable condition
POD#3

- CO2 laser excision of subglottic stenosis was performed by ENT
  - Recovery was uneventful
- Discharged to home on POD#4 with follow-up arranged with ENT

Wegener’s Granulomatosis
(aka Granulomatosis with Polyangiits)

- An autoimmune disorder characterized by necrotizing granulomatous disease of the upper and lower respiratory system and vasculitis in small blood vessels
- Affects upper/lower respiratory system, nervous system, and kidneys
- Prevalence of 3 per 100,000 persons

Airway Manifestations of Wegener’s Granulomatosis

- Pulmonary infiltrates, cough, hemoptysis
- Sinusitis, epistaxis, saddle nose deformity
- Subglottic and laryngeal stenosis can occur in up to 25% of patients
  - Typically presents as stridor


Subglottic Stenosis


- Incidence is higher in patients who develop granulomatosis in childhood/adolescence rather than adulthood
- Subglottic region at risk due to:
  - Small diameter
  - Lack of distensibility
  - Poor vascularization
Subglottic Stenosis

• Inflammation of the trachea results in fibrotic scar tissue
• Damaged tissue heals concentrically, reducing lumen size
• Average time period is 39-60 months
  – Can be as acute as 3-12 months

Symptoms/Early Diagnosis

• Presentation often independent of systemic symptoms of Wegener’s
• Does not always follow same time course or respond to same treatment
• Symptoms are non-specific until stridor appears
  – Can and often are mistaken for other pulmonary disorders (i.e asthma)
Tracheal Stenosis Confused with COPD/Asthma

- Barreiro et al. Iatrogenic tracheal stenosis presenting as persistent asthma. Respir Care 2013; 58(9):e107-e110


- AP lateral views may provide visualization of intra-thoracic trachea
- Abnormalities may be obscured by overlying mediastinal structures and bony structures
  - Obesity
- MRI/CT and bronchoscopy remain the gold-standard for diagnosing and assessment of tracheal obstructions
  - These are not routinely performed pre-operatively

Treatment

- Depends on degree of stenosis and systemic activity
- Tracheal dilatation is the most common therapy
  - CO2 laser resection with/without intralesional glucocorticoid injections are common adjuvants


Treatment

- Severe stenosis may require a temporary or permanent tracheostomy
- Tracheal stent surgery, CO2 laser excision, or tracheal reconstruction may be required


Restenosis

- Restenosis can occur in 50-75% of cases
- Local recurrences are usually treated with immunosuppression and repeated dilatations
  - Average number of dilatations 1-4
  - Interval 12-18 months
- Presence or absence of fibrotic scar tissue influences the number and frequency of repeat dilatations

Girard C et al. Tracheobronchial stenosis in granulomatosis with polyangiitis (Wegener’s): a report on 26 cases. Medicine (Baltimore). 2015; 94:e1088

Back to our Case: 4 months later

- Patient returned to Stanford for her RYGB
- Her preoperative exam was unchanged
- Her intraoperative course was changed....

- Direct laryngoscopy revealed a grade 2b view and tracheal intubation was successful with a 6.0 ETT
- The rest of her perioperative course was uneventful
- She was DC’d to home on POD#2
Summary

• Wheezing and reduced lung volumes may be common in bariatric patients
• In the absence of stridor, wheezing may be misdiagnosed as asthma
• Index of suspicion for tracheal pathology should be high in the setting of Wegeners Granulomatosis

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