Hemoptysis With Normal Chest Roentgenogram In A Former Smoker

J Akella, M Anwer, M Niazi, S Venkatram

Citation

J Akella, M Anwer, M Niazi, S Venkatram. *Hemoptysis With Normal Chest Roentgenogram In A Former Smoker*. The Internet Journal of Pulmonary Medicine. 2010 Volume 12 Number 2.

Abstract

Tracheal papillomas are rare tracheal tumors. These tumors are usually benign and present with signs and symptoms of air way obstruction and hemoptysis. This is a disease predominantly seen in infants and children and is usually associated with laryngeal papillomatosis. The clinical manifestations are diverse and the disease is rarely considered in the differential in adult patients with hemoptysis. We present a rare case of isolated tracheal papillomatosis presenting with hemoptysis and a brief review of literature.

INTRODUCTION

Tracheal papillomas are rare tracheal tumors. These tumors are usually benign and present with signs and symptoms of air way obstruction and hemoptysis. This is a disease predominantly seen in infants and children and is usually associated with laryngeal papillomatosis. The clinical manifestations are diverse and the disease is rarely considered in the differential in adult patients with hemoptysis. We present a rare case of isolated tracheal papillomatosis presenting with hemoptysis and a brief review of literature.

CASE REPORT

A 55 year-old Hispanic male was referred to pulmonary clinic with history of dry cough for 3 months. Cough was paroxysmal and associated with episodes of mild hemoptysis (approximately a tea-spoon) each time at the end of his coughing episode. These episodes ranged 6-8 per day. He denied fever, chest pain and shortness of breath. He was a former cigarette smoker (50 pack-years) and had quit 7 years ago. Occupational and travel history were unremarkable. Physical examination was normal. There was no clubbing, stridor or ronchi. Chest x-ray and CT scan revealed absence of parenchymal and endobronchial lesions (figure 1 & 2). The patient underwent flexible fiberoptic bronchoscopy (FFB) to rule out endobronchial lesion as a cause of his hemoptysis. Bronchoscopy revealed multiple white shiny glistening lesions at the 3rd tracheal ring (Figure 3). The upper air way including larynx and the rest of the tracheobronchial tree was normal. Endobronchial biopsies of the lesions revealed squamous papilloma. (Figure 4)

Figure 1

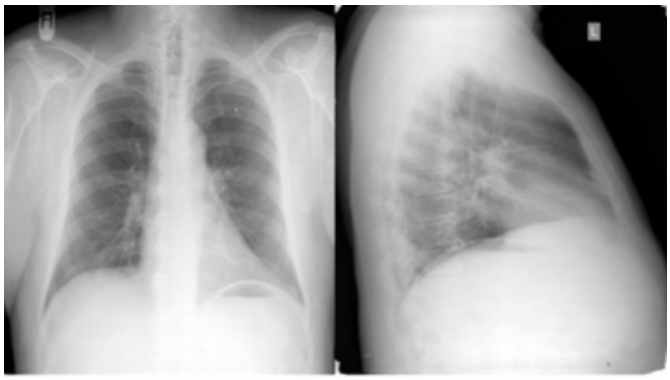

Figure 1: Chest radiography

Figure 2

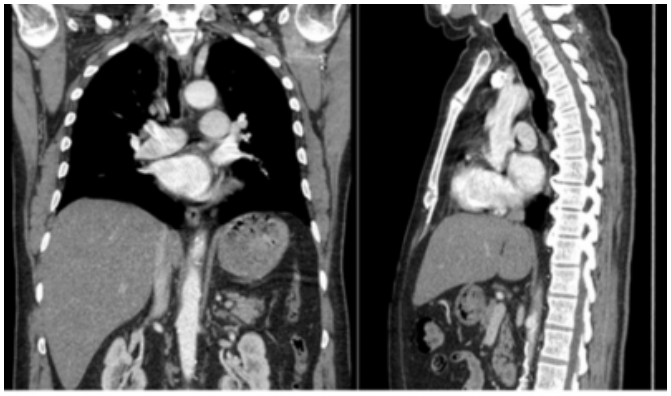

Figure 2: CT scan of chest (coronal and sagittal view)

Figure 3

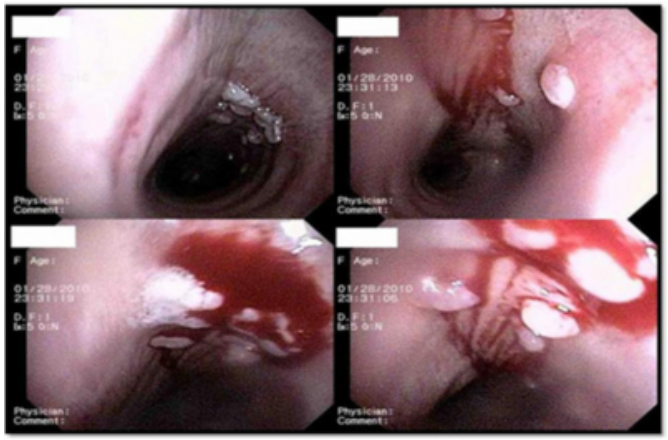

Figure 3: Bronchoscopic images showing smooth lesions with evidence of bleeding at the third tracheal ring

Figure 4

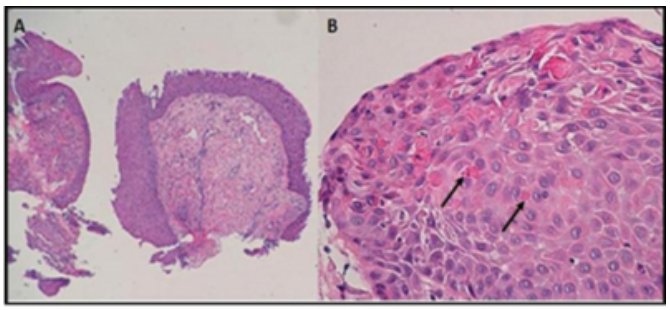

Figure 4:Tracheal papillomatosis
A) Low power view: Papillary proliferation of squamous and columnar epithelium supported by well formed fibro vascular stroma
B) High power view: Clumped kerato hyaline bodies and eosinophilic cytoplasmic Inclusions (arrows) suggestive of viral etiology

DISCUSSION

Recurrent respiratory papillomas (RRP) are the most common benign tumors of the tracheobronchial tree and they are classified as either inflammatory or as laryngotracheobronchial papillomatosis. RRP's are classified as Juvenile onset recurrent respiratory papillomas (JORRP) when it occurs in children and adult onset recurrent respiratory papillomatosis (AORRP) when seen in adults. JORRP is the commonest benign lesion in children and is second common cause of benign tracheal lesions in adults. RRP is a rare disease with an incidence of 1.8/100,000 adults and 4.3/100,000 children.

RRP occur in two forms: multiple and solitary. The multiple form of airway papilloma, known as recurrent respiratory papillomatosis is a neoplastic growth secondary to infection with DNA viruses of papovaviridae family, the human papillomavirus (HPV) types 6 and 11 and to a lesser extent with HPV16 and 18. Once transmitted to the airway, HPV establishes itself in the basal layer of the mucosa, where viral DNA enters the cell and produces ribonucleic acid (RNA) to produce viral proteins, similar to the replication mechanism of other viruses. This action incites the transformation of the mucosa to papilloma formation. These associations have been proven by DNA analysis and electron microscopy. Solitary papilloma of the tracheobronchial tree is less common than the multiple forms and occurs usually in adults. Unlike the multiple forms, solitary papilloma is idiopathic or related to cigarette smoking

Inflammatory papillomas can be solitary or multiple and is usually a consequence of irritation by foreign bodies, exposure to corrosive gases or broncholithiasis.

Clinical features of these tumors are variable with hoarseness of voice as a leading symptom in pediatric population. The usual age of onset is 2-3 years and shows no gender prevalence. Stridor is common, which is initially inspiratory and later biphasic. Respiratory distress secondary to air way obstruction is seen.

In adults, RRP usually is more common in males (4:1) and is a disease seen in 3rd or 4th decade. However this may occur at any age and oldest reported in literature is 84 years. Adult patients present with wheezing, cough, dyspnea and hemoptysis. Large bronchial papillomas can result in occlusion with post obstructive pneumonia.

Chest imaging is usually normal. Radiologic findings when present consist of intra-luminal masses, atelectasis, and obstructive pneumonitis. Involvement of the distal airway can produce pulmonary nodules that frequently cavitations.

The definitive diagnosis of laryngotracheobronchial

papillomatosis is based on biopsy of laryngeal or tracheal lesions Bronchoscopy is diagnostic and the lesions appear like wart or pedunculated masses; the epithelium is usually intact but tends to bleed easily. When grouped together, rarely these lesions may look like lobulated masses with cauliflower appearance.

Pathologically, gross examination reveals polypoid or sessile masses within the airways. Central airway involvement is seen in 2%-5% of patients with laryngeal papillomas, whereas small airway or alveolar involvement occurs in less than 1%. The lesions are characterized histologically by a proliferation of well-differentiated squamous epithelium with a central fibro vascular core. RRP is a laryngo-pharyngeal disease but can spread to lower respiratory tract in 5 to 20 percent and pulmonary parenchyma in 1 percent of cases. However in patients with laryngeal papillomatosis, a large series from John Hopkins revealed an incidence of 69 percent sub glottic disease and tracheal involvement was seen in 26 percent. Tracheal involvement without laryngeal involvement is very rare and rarely suspected before bronchoscopic examination.

Although a viral etiology remains without doubt, mode of transmission is unclear. In pediatric population patients with RRP is generally first born and vaginally delivered in teenage mothers with genital HPV infection, suggesting exposure to the virus by this route. In adult cases this association is less strong. Other risk factors for AORRP include multiple sexual partners and a higher frequency of oral sex. In pediatric population RRP tend to recur and disseminate. When followed up over time, malignant transformation was seen in 1.6 percent of pediatric population over 2 decades. In adults, papillomas are generally considered benign but malignant transformation to squamous cell carcinoma has been reported in 10%-50% of cases. It is unclear if there is an association of prior irradiation or mutation with p 53 gene with malignant transformation in adults, though this is as associated feature in children. Spread to lower respiratory tract is associated with malignant transformation.

Treatment modalities in pediatrics include surgical therapies with a goal of complete removal of papillomas with preservation of normal anatomy. This is critical to prevent subsequent sub glottic stenosis, web formation and tracheal stenosis. However HPV is seen in both papillomas and normal tissues surrounding these lesions making surgical cure difficult and recurrence more likely. Newer treatment modalities include CO2 laser surgery, pulse dye laser and microscopic debriders. Adjuvant treatment modalities include anti virals (Ribavirin, Acyclovir, Cidofovir) and alpha interferon. Retinoid and photodynamic therapies have been utilized. Emerging strategies include gene therapies. HPV vaccination looks promising in a recently concluded study. Some small case series have reported combination therapy with cidofovir injections topically after laser surgery.

In adults, small lesions with minimal symptoms can be treated with corticosteroids and antibiotics. Larger, symptomatic lesions can require bronchoscopic procedures such as curettage, laser ablation, electrocautery and cryosurgery. In patients with high suspicion of malignancy, thoracotomy and resection is a consideration.

Long term follow up of patients with JORRP has been well elucidated in longitudinal studies. Aggressive disease is associated in younger patients (less than 3 years at diagnosis), HPV-11. These patients are more likely to have greater tracheal involvement and need for tracheostomy. This group of patients had more procedures per year, more frequent debridements and had a greater need for other adjuvant therapies.

Our case is unusual in that our patient presented with hemoptysis and bronchoscopy revealed isolated tracheal papillomatosis without laryngeal involvement. Tracheal papillomatosis remains a diagnostic consideration in cases of persistent cough and hemoptysis with normal radiologic findings. Flexible fibreoptic bronchoscopy with biopsy is diagnostic. Our case shows the importance of bronchoscopic examination to identify papillomas and other tracheobronchial lesions, in patients with hemoptysis. Our patient was referred to a tertiary center for surgery.

References

1. Derkay CS, Wiatrak B. Recurrent respiratory papillomatosis: a review. Laryngoscope 2008; 118:1236–1247.
2. Le Roux, H, Williams. MA, and Kallichurum, S: Squamous papillomatosis of the trachea and bronchi. Thorax 24:673-677, 1969.
3. Silver RD, Rimmel FL, Adams GL, et al. Diagnosis and management of pulmonary metastasis for recurrent respiratory papillomatosis. Otol Head Neck Surg 2003; 129:622–629.
4. Soldatski IL, Onufrieva EK, Steklov AM, et al.Tracheal, bronchial and pulmonary papillomatosis in children. Laryngoscope 2005;115:1848–1854
5. Breen DP, Lyons O, Barrett H, et al. Isolated tracheal papillomatosis—An infrequent cause of chronic cough. Resp Med Extra, Volume 3, Issue 1, 2007, Pages 21-22
6. Bennett RS, Powell KR. Human papillomaviruses: associations between laryngeal papillomas and genital warts.

Pediatr Infect Dis J 1987; 6:229–232.
7. Wiatrak BJ, Wiatrak DW, Broker TR, Lewis L. Recurrent respiratory papillomatosis: a longitudinal study comparing severity associated with human papilloma viral types 6 and 11 and other risk factors in a large pediatric population. Laryngoscope 2004; 114:1–23.
8. Kashima H, Mounts P, Leventhal B, Hruban RH. Sites of predilection in recurrent respiratory papillomatosis. Ann Otol Rhinol Laryngol 1993;102:580–583
9. Kramer SS, Wehunt WD, Stocker JT, Kashima H. Pulmonary manifestations of juvenile laryngotracheal papillomatosis. AJR Am J Roentgenol 1985; 144:687–694.
10. Alkotob ML, Budev MM, Mehta AC. Recurrent Respiratory Papillomatosis, J Bronchol; 2004 - Volume 11 - Issue 2 - pp 132-139
11. Bielamowicz S, Villagomez V, Stager SV, Wilson WR. Intralesional cidofovir therapy for laryngeal papilloma in an adult cohort. Laryngoscope 2002; 112:696–699.
12. Wiatrak BJ, Wiatrak DW, Broker TR, Lewis L. Recurrent respiratory papillomatosis: a longitudinal study comparing severity associated with human papilloma viral types 6 and 11 and other risk factors in a large pediatric population. Laryngoscope 2004; 114:1–23.
13. Al-Saleem T, Peale AR, Norris CM. Multiple papillomatosis of the lower respiratory tract. Cancer 1968; 22:1 173-1181
14. DiMarco AF, Montenegro H, Payne CB Jr, Kwon KH. Papillomas of the tracheobronchial tree with malignant degeneration. Chest 1978; 74; 464-465
15. Mehdi P, Lee EM, Ali RR etal. Malignant Degeneration of Tracheobronchial Papillomatosis: A Case Report. SMJ: 1999 - Volume 92 - Issue 11 - pg S57
16. Lam CW, Talbot AR, Yeh KT, Lin SC, Hsieh CE, Fang HY. Human papillomavirus and squamous cell carcinoma in a solitary tracheal papilloma. Ann Thorac Surg 2004; 77:2201–2202.

Author Information

Jagadish Akella, MD
Fellow, Pulmonary medicine, Bronx Lebanon Hospital Center

Muhammad Anwer, MD
Fellow, Pulmonary medicine, Bronx Lebanon Hospital Center

Masooma Niazi, MD
Chair, Department of Pathology, Bronx Lebanon Hospital Center

Sindhaghatta Venkatram, Md, Fccp
Director, Critical Care Units, Bronx Lebanon Hospital Center