

UT Houston Journal Of Internal Medicine

Vol 1, Issue 4

Editors- Reeti Joshi, Mark Fasulo and Alex Flores



THE UNIVERSITY of TEXAS
MEDICAL SCHOOL AT HOUSTON

A part of The University of Texas Health Science Center at Houston

A rare case of quartet cancer

By Muhammad Awais PGY III Internal Medicine

Introduction:

Cancer continues to be the second most common cause of death in USA, exceeded only by heart disease. According to American Society of Cancer approximately 1,479,350 new cancer cases are expected to be diagnosed and about 562,340 Americans are expected to die of cancer in 2009 i.e. more than 1,500 people a day¹. We report a case of quartet cancer that was evaluated and managed at our institute.

Presentation:

Our patient is a 62-year-old Caucasian male with history of multiple cancers including NHL lymphoma and testicular cancer presented with dysphagia and shortness of breath for 10 days. He had been having trouble swallowing solids limiting him only to liquids. He has also noticed increased clear secretions and weight loss of around 30 pounds. He also reports going to outside hospital where he was thought to have bronchitis and given symptomatic treatment, however on the day of admission patient had an acute episode of shortness of breath, cyanosis and syncope. EMS was called who found patient on floor with cyanosis and sinus tachycardia. 3 attempts at intubation failed and he was transported via life flight to Memorial Hermann Hospital. He was ultimately intubated by life flight personnel via a small sized ET tube and admitted to MICU for further management.

His oncologic history includes history of testicular cancer diagnosed in 1985, status post orchiectomy with no adjuvant therapy. History of Non-Hodgkin's lymphoma diagnosed in 2008, treated with 4 cycles of chemotherapy with CHOP and Rituxan at outside hospital.

Patient denies any family history of cancers. He is a nonsmoker and social drinker. He has been a safety consultant and denies any chemical exposures.

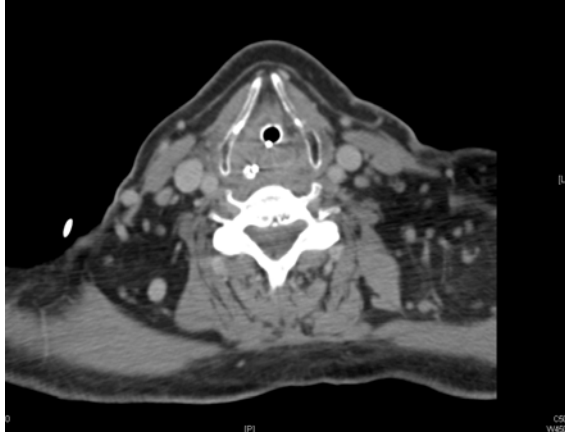
Hospital Course:

With the history of dysphagia and difficult intubation patient underwent imaging which was suspicious for a laryngeal mass (see CT figures 1A and 1B and MRI 2A and 2B Below)

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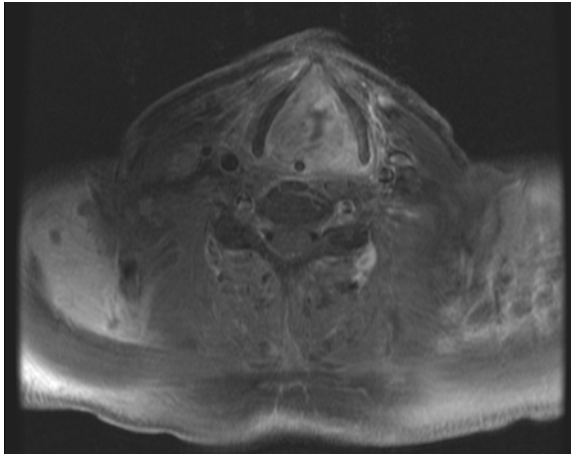
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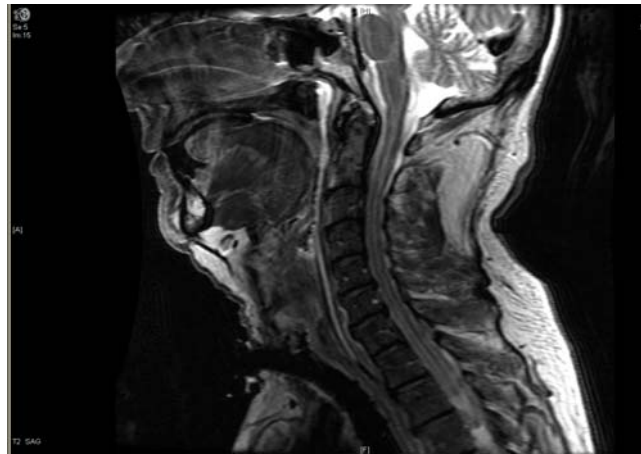
1A Axial Section showing space occupying lesion in larynx.



1 B Sagittal section showing the space occupying lesion in larynx.

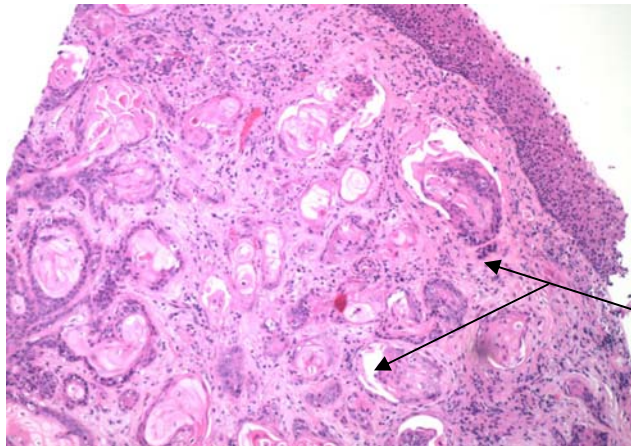


2A MRI Axial section after tracheostomy above the tracheostomy site showing complete obstruction of airway.



2B Sagittal section after tracheostomy showing obstruction.

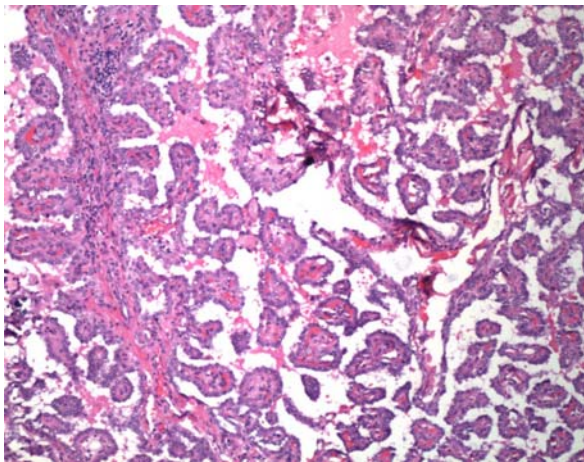
Based on imaging he underwent open tracheostomy, laryngoscopy with telescope and biopsy, esophagoscopy and bronchoscopy through the tracheostomy site. He also underwent biopsy of thyroid nodule which was seen as suspicious through the tracheostomy incision. Biopsy revealed well to moderately differentiated squamous cell carcinoma of supraglottis with HPV associated changes. See figures 3A and 3B below



Normal Squamous Epithelium

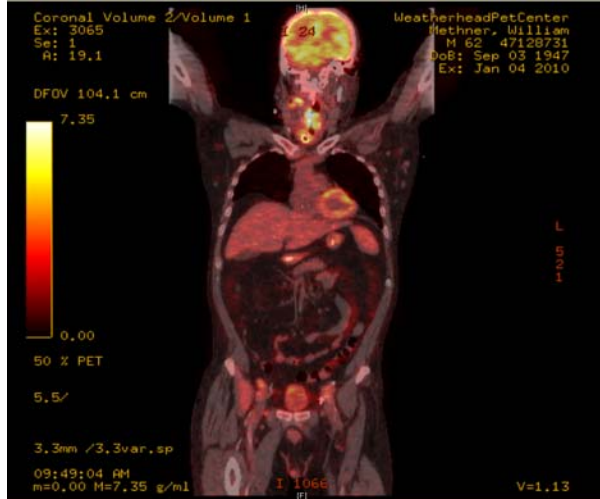
Abnormal/ malignant cells

3A Supraglottis with normal and abnormal squamous cells



3B Papillary Thyroid Cancer

After the biopsy a PET Scan was done to stage the tumor which showed Intense FDG uptake in mass extending from oropharynx into the larynx with narrowing of the airway suggestive of lymphomatous infiltration of soft tissue. It also showed lymphomatous infiltration of lymph nodes including right submandibular and superior cervical lymph nodes as well as in bilateral axillary, bilateral iliac and right inguinal lymph nodes. See figure 4.



4. PET scan showing intense FDG uptake in oropharynx and larynx

Patient underwent a total laryngectomy, total thyroidectomy, bilateral neck dissection and cricopharyngeal myotomy which was consistent with the prior biopsy. A lymph node biopsy was also taken which showed B cell lymphoma and no metastasis. He successfully recovered from his surgery and after a brief period of stay in rehabilitation was discharged home to follow up at oncology clinic with his oncologist.

Discussion:

This is a very interesting and rare case of multiple primary cancers. Very few cases of quartet cancers have been reported in literature, majority of which are reported in Japanese literature. Kurihara & Ishida et al. reported a case of breast, renal cell, thyroid and a sigmoid colon cancer². All of these cancers were found to be primary in nature. Another case of triple cancer was reported by Iqbal et al. who reported primary cancers of the larynx, lung and thyroid presenting in one patient³. Besides these reports, the well known examples of multiple cancers presenting together include Lynch syndrome and Li Fraumeni syndrome. Lynch syndrome is an autosomal dominant disorder that increases the risk of colon cancer as well as others including endometrium, ovary, stomach, small intestine, hepatobiliary tract, upper urinary tract, brain, and skin⁴. The increased risk for these cancers is due to inherited mutations that impair DNA mismatch repair⁴.

Le Fraumeni syndrome comprises of breast cancer, brain tumors, acute leukemia, soft tissue sarcomas, bone sarcomas, and adrenal cortical carcinoma. It is a rare autosomal dominant hereditary disorder linked to germline mutations of p53 tumor suppressor gene⁵. To date there is no syndrome that describes the presentation of our case.

The above mentioned syndromes give us the insight towards genetic and molecular basis of cancers. Our patient presented with HPV associated squamous cell carcinoma of the larynx. Multiple molecular studies have reported that HPV mediated carcinogenesis is mainly due to the oncogenic activities of the viral early proteins E6 and E7. E6 is able to induce the degradation of p53 *via* direct binding to the ubiquitin ligase E6AP, inhibiting p53-dependent signaling upon stress stimuli, and contributing to tumorigenesis. On the other hand, E7 oncoprotein associates with the retinoblastoma family of proteins (pRb, p107 and

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p130) and disrupts their association with the E2F family of transcription factors, subsequently transactivating cellular proteins required for cellular and viral DNA replication. Moreover, E7 binds and induces the proteosomal-mediated degradation of all pRb, p107 and p130 proteins⁶ leading to cancer.

In mammalian cells, the progression of replicating cells through the cell cycle is controlled by the sequential formation, activation, and subsequent inactivation of a series of specific cyclin dependent kinase (CDK) complexes. There is now abundant evidence that disturbances in specific cyclins, CDKs, or various inhibitory proteins play an important role in several types of human cancer⁷. The most frequent disturbance relates to cyclin D1 which deactivates the tumor suppressor protein pRB⁸. The phosphorylation of pRB results in its inactivation and the release of E2Fs that have been sequestered by the unphosphorylated (active) form of pRB. Once liberated by pRB inactivation, E2Fs then proceed to activate genes that are essential for advances into the late G1 and S phases⁸. Consistent with its growth-promoting role, cyclin D1 has been implicated as an oncogene. In fact, rearrangement, amplification, and/or increased expression of the cyclin D1 gene and overexpression of its mRNA have been reported in several types of human cancer, including head and neck⁹ mantle cell and B cell lymphomas¹⁰, breast¹¹, human parathyroid adenomas⁷, colon, lung¹², bladder and liver cancers, and squamous carcinomas of the esophagus^{7,13}.

Conclusion:

Based on the above mentioned discussion we recommended that the patient undergoes a genetic analysis especially cyclin D1 analysis. Although it is possible that our patient has all these tumors as a coincidence and the lack of family history or any other toxic chemical exposure supports the likelihood of chance. But in the presence of HPV associated laryngeal cancer and involvement of Cyclin D1 in B-cell lymphoma, thyroid and head neck cancers, genetic susceptibility cannot be excluded. Further research in this field will definitely provide basis for not only early diagnosis but also targeted therapies towards these cancers.

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Goodpasture's Disease presenting as Acute Renal Failure

Brittany N. Burkhalter, MSIII and Emily Krennerich, MSIII

Keywords: Goodpasture's syndrome, Goodpasture's disease, anti-glomerular basement membrane antibodies (Anti-GBM), glomerular basement membrane, plasmapheresis, hemoptysis, pulmonary hemorrhage, acute renal failure

Introduction

Goodpasture's disease presents with acute or rapidly progressive glomerulonephritis and pulmonary hemorrhage resulting from anti-glomerular basement membrane (GBM) antibodies. The term Goodpasture's syndrome is used when a patient presents with the clinical constellation of glomerulonephritis and pulmonary hemorrhage, regardless of the underlying pathogenesis.

Case Presentation

A 60 year old Caucasian man with recently diagnosed diabetes and hypertension presented to the ED with acute renal failure (ARF) and altered mental status. Due to his mental status, his history was obtained from his girlfriend. He had visited a primary care physician 2 weeks earlier for the first time in over 10 years and was diagnosed with diabetes, hypertension and a UTI. He was placed on hyzaar, janumet and cefexime at that time. Approximately 1 week later he experienced a decrease in urine output followed by a progressive decline in mental status and weakness. He smoked tobacco daily and had a non-contributory family history.

On admission to the MICU, the patient was found to have a potassium of 8.5, creatinine of 26.7, BUN of 272, and blood pressure of 182/87. Neurology and renal services were consulted regarding his altered mental status and ARF. A CT of the head was performed which revealed no acute intracranial hemorrhage, but did reveal an intraventricular lesion (1.6 x 0.9 cm) that was better evaluated with an MRI. Neurology recommended a lumbar puncture, which was unremarkable with 1 WBC, 1 RBC, VDRL negative, total protein of 50.1, and glucose of 72. Renal recommended hemodialysis, which led to a resolution of his uremia. The patient also received 2 units of PRBCs due to symptomatic anemia which improved post transfusion. He was transferred to the floor 2 days later and a PermCath was placed on hospital day 14. A renal biopsy revealed severe acute interstitial nephritis (no glomeruli present for evaluation) and the patient continued to be anuric throughout his hospital stay. During his stay he developed a dry cough that seemed to resolve after discontinuing his lisinopril. After multiple rounds of dialysis, the patient was discharged on hospital day 17 and instructed to follow up in the Renal Clinic. He

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was advised of the signs and symptoms of hyperkalemia, uremia, and symptomatic hypertension and told to return to the ED promptly if he experienced any of these.

One day post-discharge, the patient returned to the ED with signs and symptoms consistent with bilateral upper lobe pneumonia. He was started on antibiotics (vancomycin and ceftriaxone), but his oxygen saturation continued to deteriorate and his WBC count continued to climb (8.2 → 12.4). He required 2 units of PRBCs due to symptomatic anemia which improved post transfusion, but continued to trend downward daily. He initially appeared to be producing “rust colored” sputum, but on further examination he was found to have frank hemoptysis. He continued to deteriorate despite medical management and repeated dialysis. In light of his hemoptysis and low oxygen saturation (72% on 15L) a chest CT was ordered which showed ground glass opacities consistent with pulmonary alveolar hemorrhage. On day 23 from the patient's initial admission his laboratory results revealed that he was PR3-ANCA and anti-GBM antibody positive and he was formally diagnosed with Goodpasture's disease. He was quickly transferred to an outside hospital for treatment and was eventually discharged home after a long stay with multiple complications.

Discussion

Goodpasture's disease is rare, with an incidence of approximately 0.1 cases per million population. There is currently a lack of consistency regarding gender distribution between studies. Younger patients (<30 years) are more likely to present with the full constellation of Goodpasture's disease, and older patients (>50 years) are more likely to present with isolated glomerulonephritis.

Goodpasture's disease is an autoimmune disorder in which circulating antibodies are directed against an antigen intrinsic to the GBM, thereby resulting in acute or rapidly progressive glomerulonephritis that is typically associated with crescent formation. The principal target for the anti-GBM antibodies (usually IgG but can be IgA or IgM) is the NC1 domain of the alpha-3 chain of type IV collagen found in the basement membrane of renal glomeruli as well as in pulmonary alveolar basement membranes.

The presentation usually involves relatively acute renal failure with a urinalysis showing proteinuria (which is usually not in the nephrotic range), and a nephritic sediment characterized by dysmorphic red cells, white cells, and red cell and granular casts. Renal biopsy usually shows crescentic glomerulonephritis along with the pathognomonic finding of linear deposition of IgG along the glomerular capillaries with immunofluorescence microscopy (figure 1). Lung involvement affects approximately 60-70 percent of patients and typically consists of alveolar hemorrhage (figure 2). Pulmonary manifestations may include dyspnea, cough, hemoptysis, pulmonary infiltrates on chest x-ray, and increased carbon monoxide diffusing capacity (DLCO) due to the presence of hemoglobin in the alveoli. The variable presence of pulmonary disease appears to reflect a general lack of access of the circulating anti-GBM antibodies to the alveolar basement membrane. Patients with pulmonary involvement often have underlying pulmonary injury due to smoking, or less frequently, infection, cocaine inhalation, or hydrocarbon exposure. This patient was a smoker and may have had a pulmonary infection as well. Iron deficiency anemia, possibly due to prolonged pulmonary bleeding, may also be seen as with this patient.

Goodpasture's disease is known to be associated with severe renal injury that if left untreated, progresses quickly to end stage renal disease requiring dialysis. Studies show that the detection of ANCA is clinically relevant, because these patients may be more likely to have treatable disease than those who have only anti-GBM antibodies. Plasmapheresis in combination with immunosuppressant therapy with

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cyclophosphamide and prednisone is the treatment of choice and should be started immediately.

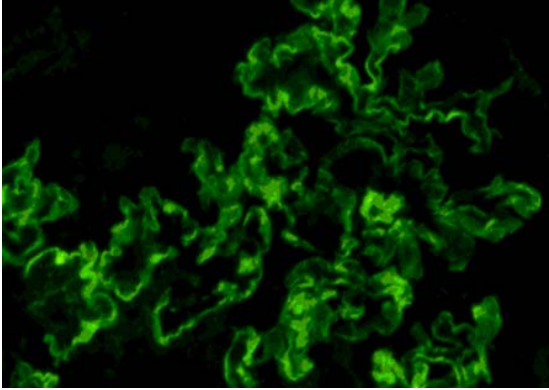


Figure 1. Immunofluorescence microscopy showing characteristic linear deposition of IgG in anti-GBM antibody disease.



Figure 2. (A) Computed tomographic (CT) image at the level of the aortic arch shows centrilobular ground-glass opacities throughout the upper lobes due to diffuse pulmonary hemorrhage



(B) CT image at the level of the right main pulmonary artery shows ground-glass opacities in the lower lobes

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Small Cell Carcinoma: Whiteout

Matthew Chinn, MS3

Key words: small cell, lung cancer

Presentation

A 47 year old African American female with a 20-pack-year history of smoking and no other past medical history presented to the ED with two-months of increasing shortness of breath. On the day of admission, she was acutely short of breathe that morning and unable to perform her normal activities. She also reports a two month history of cough with daily sputum production, without evidence of blood, of approximately one teaspoon per day, a 60lb weight loss over the past year, loss of appetite, fatigue, and new onset hoarseness. She reports the shortness of breath is worsened by walking greater than one-block and better with rest and sporadic use of a neighbor's Albuterol inhaler. Family history is significant only for diabetes mellitus and hypertension. Patient has an ETOH history of a 12-pack per week for 20 years and had been to jail several years ago. No exposure to tuberculosis, coal, or asbestos. The patient worked as a home helper and in the dry cleaning industry for 28 years. Respiratory rate was 20 breathes per minute and all other vital signs were within normal limits. Patient appeared in no apparent distress and had no retractions or accessory muscle use. Pertinent physical exam findings were cachetic appearance, mild thyromegaly with a hard texture and little movement when swallowing, and a displaced PMI of 1cm lateral to mid-clavicular line. Additionally, on respiratory exam there was decreased expansion, egophony, hyporesonance, decreased tactile fremitus and whispered pectoriloquy on the left side. Physical exam was unremarkable for muscle fatigue, tracheal deviation, diffuse lymphadenopathy, miosis, anhydrosis, ptosis, JVD, or facial flushing.

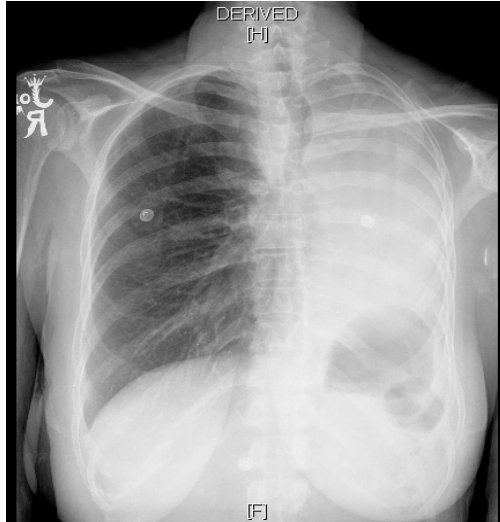
Assessment

Labs

Cardiac enzymes were negative. CBC, BMP, Ca, Mg, Phos, LFTs, Thyroid panel, and coags were all within normal limits on admission. AFB was negative. Further labs included: ionized Ca of 1.11, urine free cortisol of 26.90, and random urine sodium of 115.

Diagnostics

A CXR (Fig. 1) on admission showed a complete opacification of the left hemithorax with volume loss and bronchial narrowing likely secondary to an obstructing mass with associated left lung atelectasis.



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Fig. 1. CXR showing complete opacification of the left hemithorax with tracheal deviation and elevation of left hemidiaphragm

A CT scan of the chest (Fig. 2) also showed a total opacification of the left lung due to a mass surrounding the left mainstem bronchus causing atelectasis and narrowing the pulmonary artery. It also showed a large thyroid mass on the right side, extensive mediastinal lymphadenopathy, left sided effusion, and mild centrilobular and paraseptal emphysema. CT scan of the abdomen and pelvis was negative. Brain imaging is pending.

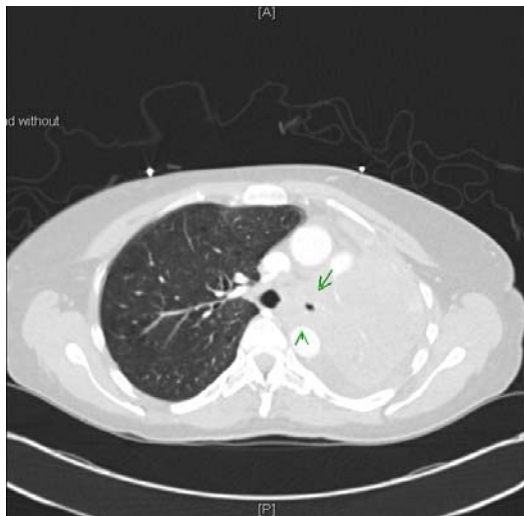


Fig. 2. CT scan of chest showing total opacification of the left lung and a large central mass surrounding the left mainstem bronchus

Bronchoscopy revealed complete obstruction of the left mainstem bronchus and nodules in the right mainstem bronchus. It also revealed decreased excursion of the vocal cords bilaterally. Biopsy was done and cytology/histology confirmed small cell carcinoma of the lung (Fig. 3). FNA of the thyroid was done and the results were inconclusive. TTE results yielded an EF of 60-65% with a small effusion.

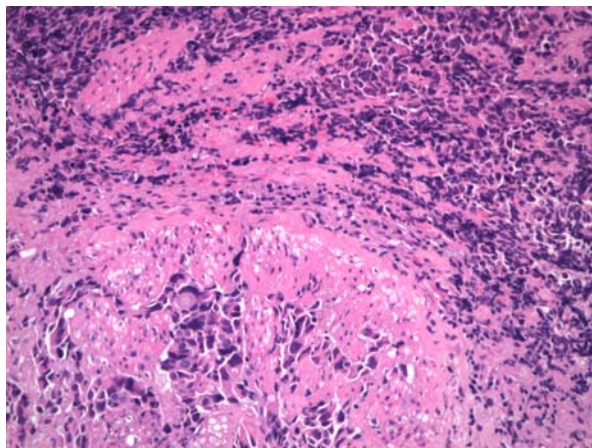


Fig. 3. Lung biopsy showing tumor cells with scant cytoplasm and “nuclear molding” characteristic of SCLC

Hospital Course

Patient was initially admitted to the floor for work-up of possible cancer. Upon discovery of the decreased excursion of the vocal cords during bronchoscopy, ENT was consulted and they confirmed no movement of the right vocal cord and minimal movement of the left vocal cord with a 3mm opening. The patient was transferred to the MICU for closer evaluation. Overnight the patient was taken for an emergent tracheostomy. The patient was started on chemotherapy with Etoposide and Cisplatin and transferred to the Oncology service.

Discussion

It is estimated that 219,440 people will be diagnosed with and 159,390 will die from lung cancer in 2009. The median age of diagnosis is 71 years old and the median age of death is 72 years old. Based on current rates, 6.96% of people born today will be diagnosed with lung cancer during their lifetime. (1)

There are four basic subtypes of lung cancer: adenocarcinoma, squamous cell carcinoma, large cell carcinoma, and small cell carcinoma. Adeno-, squamous cell, and large cell carcinomas are classified as non-small cell lung cancer (NSCLC), while small cell is classified independently (SCLC). (2)

NSCLC accounts for approximately 80% of all cases of lung cancer with the largest portion attributed to adenocarcinoma. Classically adenocarcinoma is described as the most common type in women, non-smokers, and younger persons. It is often located more peripherally, forming smaller masses, but metastasizing at a much earlier stage. Atypical adenomatous hyperplasia is postulated as a precursor lesion to adenocarcinoma (3). By histological exam, adenocarcinoma can assume acinar, papillary or solid configurations. Mucin production may also be present in this type of cancer. Squamous cell carcinomas are characteristically associated with men who have an extensive smoking history. They often arise as centrally located masses in major bronchi with spread to local nodes. Preneoplastic changes include hyperplasia, squamous metaplasia, and squamous dysplasia (true preneoplastic lesion) (3). Histologically, squamous cell carcinomas can be well-differentiated with characteristic keratin pearls or poorly differentiated with minimal recognizable features. Squamous cell carcinomas are also associated with parathyroid hormone-related peptide. Large cell carcinomas are undifferentiated epithelial neoplasms without the defining features of squamous or adenocarcinomas. As their name suggests, large cell carcinomas have prominent nuclei and nucleoli with moderate cytoplasm. (2)

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SCLC accounts for approximately 13-15% of all lung cancers (4). Small cell lung cancer originates from neuroendocrine cells of the lung and is often associated with peptide hormone production. The peptides include: adrenocorticotrophic hormone, antidiuretic hormone, gastrin-releasing peptide, and calcitonin (3). Paraneoplastic syndromes associated with SCLC include: SIADH, Cushing's, cerebellar degeneration, and Lambert-Eaton Myasthenic Syndrome (5). Specific precursor lesions of SCLC have not been confirmed. As their name would imply, small cell carcinoma consists of cells with a round shape and scant cytoplasm. They are typically twice the size of resting lymphocytes (2). Small cell lung cancer usually appears as a centrally located mass, often with invasion of lung parenchyma and involvement of hilar and mediastinal nodes. SCLC is classified into two stages: limited and extensive. Limited stage is disease confined to the ipsilateral thorax while extensive stage is disease beyond the ipsilateral hemithorax, which may include malignant pleural or pericardial effusions or hematogenous metastasis (6). Treatment consists of platinum and etoposide, with use of thoracic radiotherapy for limited stage disease (5). Small cell lung cancer is often initially susceptible to chemotherapy, but due to high recurrence rates is associated with a worse prognosis than NSCLC. (2)

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RECURRENT PSOAS ABSCESS IN CROHN'S DISEASE

By Kiran N Khan M.D.

INTRODUCTION:

Crohn's disease is an inflammatory bowel disease characterized by patchy inflammation of the gastrointestinal tract with several extra-intestinal manifestations like arthritis, erythema nodosum, pyoderma gangrenosum and uveitis being the most common. Intra-abdominal abscess is a known complication in Crohn's disease with a prevalence of 6% to 20% in case-reviews. However, ilio-psoas muscle abscess has been reported with less frequency (0.4%- 4.3%).¹ Described here is a patient with long term untreated crohn's disease who presented with recurrent episode of psoas abscess.

PRESENTATION:

A 44 year old African American man with 25 year history of Crohn's disease presented with watery diarrhea for 20 days before presentation, high grade fever and mild abdominal discomfort. The patient had not received any treatment for his Crohn's disease in the last 20 years while the last colonoscopy was performed in August 2007 (Figure 1) that revealed skipped areas of colonic inflammation and strictures. The patient had a prior episode of left sided ilio-psoas abscess in July of 2008 that was treated with

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interventional radiology guided drainage and the abscess healed. He also reported 20 lbs weight loss in last one month. On physical examination the patient was thin, febrile, hypotensive and tachycardiac. The abdomen was non-distended and tender to palpation with guarding but no rebound. Bowel sounds were sluggish. There were no abnormalities seen on eye, skin and joint examination. Rectal exam was not performed secondary to patients discomfort.

ASSESSMENT:

Patient's labs showed marked leukocytosis with left sided neutrophilia and 20% band formations of PMN. His hemoglobin was 9.7gm/dl that remained stable throughout the admission. He had impaired kidney function with creatinine of 1.7 mg/dl. A CT scan of abdomen and pelvis (Figure 2) revealed a large air filled and possibly stool filled cavity in the left psoas muscle with surrounding fat-stranding and edema that tracked down to the insertion of the ilio-psoas muscle in the femur. There were multiple fistulous connections of the distal small bowel loops, sigmoid colon and the adjacent cecum with evidence of proximal small bowel loop distention. There was left hydroureter and hydonephrosis present secondary to scarring in the retroperitoneal area. Patient was hydrated with normal saline and initiated on intravenous (IV) ceftriaxone 1 gm daily and IV metronidazole 500mg every 8 hours. He remained NPO and after stabilization underwent Interventional radiology guided drain placement in the abscess cavity. Cultures from the abscess grew *Escherichia coli* and *Proteus mirabilis* and the antibiotic coverage was continued. Five days post procedure, patient was to undergo surgical drainage but he became hypotensive again. He was transferred to intensive care unit and repeat CT scan of abdomen and pelvis was performed that revealed enlargement of the abscess cavity and extension into the fascial planes in the left vastus lateralis muscle. The patient underwent emergent surgical exploration that evacuated 400-500 cc liquid stool from the cavity but no evidence of necrotizing fasciitis was seen in the vastus lateralis muscle. A Penrose drain was placed in the cavity after irrigating with normal saline. Since the surgery patient's vitals and fever improved and he was continued on multiple antibiotics. The future management of this patient after control of the abscess will involve resection of the fistulous bowel and initiation of Crohn's disease treatment as out-patient.

DISCUSSION:

Ilio-psoas abscess complicating Crohn's disease is uncommon. Since the first case reported by Van Patter et al. in 1954 only about 100 cases have been reported so far.² This case is unique as the patient had a second episode of ilio-psoas abscess after two years of apparent remission. Before the advent of CT scan, the diagnosis of ilio-psoas abscess in Crohn's disease was usually delayed as it may present with non-specific symptoms. Symptoms such as fever, abdominal pain, local tenderness, and weight loss are frequently observed. If left untreated the complication of ilio-psoas abscess may include necrosis, septic arthritis of vertebra and hip joint and death from septic shock. Therefore prompt diagnosis and management is necessary in these patients. The initial management includes hydration and initiation of broad spectrum antibiotics that target the enteric bacteria including anaerobic pathogens.³ Percutaneous drainage under radiological guidance is an acceptable first step in the management of these patients as it has been associated with long term remission. Casulo et al. reported 15 cases of ilio-psoas abscess in Crohn's disease that underwent CT guided abscess drainage and did not require any surgical intervention.⁴ The patient presented underwent percutaneous drainage in 2008 and remained stable for two years. If the abscess size is large or the patient is unstable then percutaneous drainage usually acts as a temporizing measure before a definite surgical intervention can be performed. In this patient the surgical drainage was necessary as the repeat CT scan showed increase in the abscess size and possible extension

UT Houston Journal Of Internal Medicine

Vol 1, Issue 4

Editors- Reeti Joshi, Mark Fasulo and Alex Flores

into the muscle fascia. Definite surgery in patients with ilio-psoas abscess in Crohn's disease usually incorporates resection of fistulous bowel with either a proximal bowel diversion or primary anastomosis depending upon patient's overall health condition at the time of surgery.¹

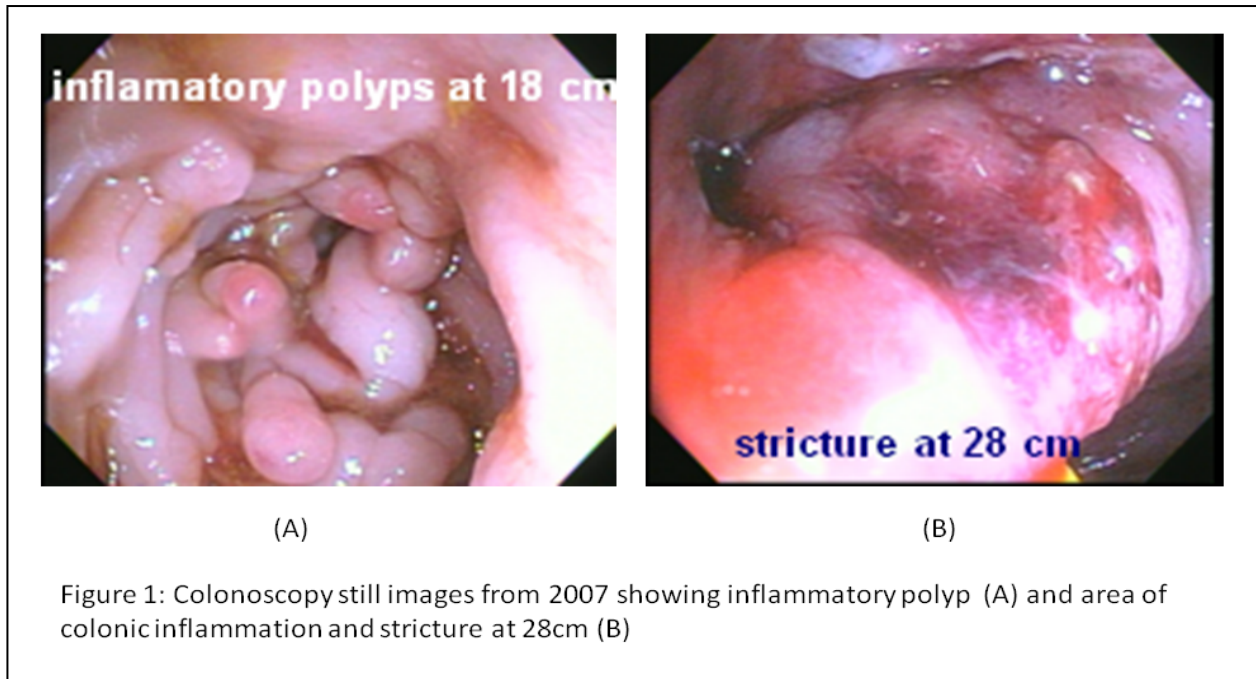


Figure 1: Colonoscopy still images from 2007 showing inflammatory polyp (A) and area of colonic inflammation and stricture at 28cm (B)

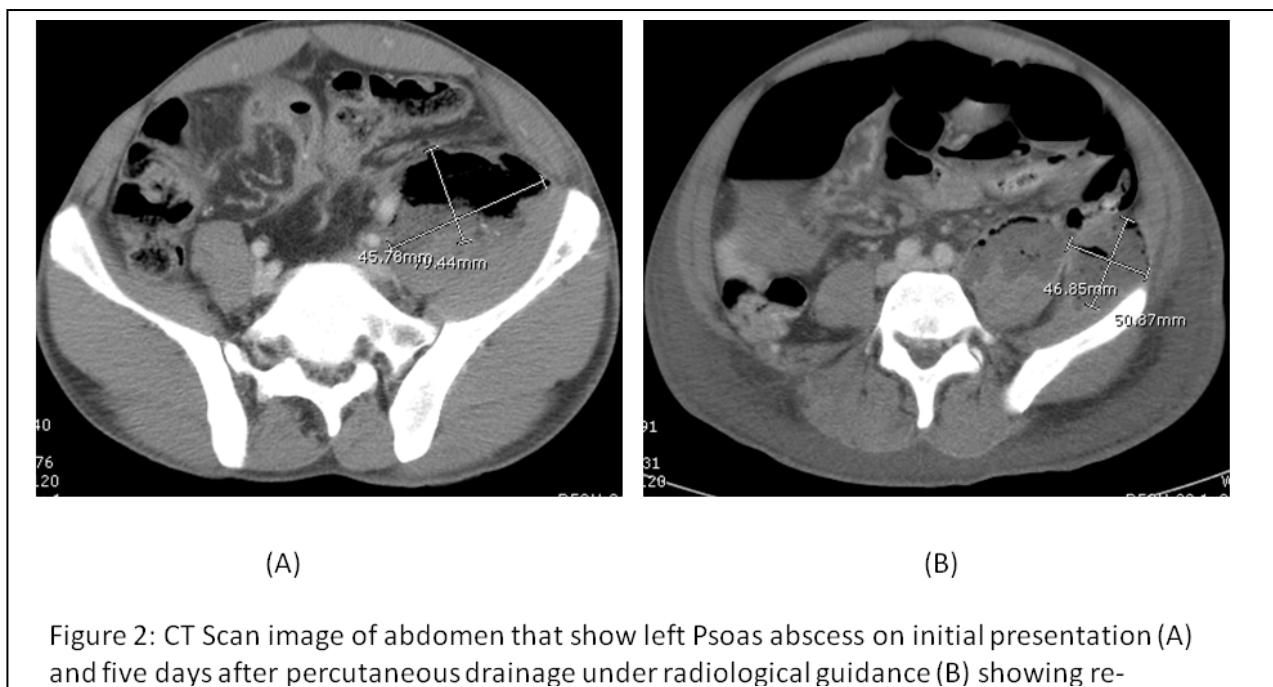


Figure 2: CT Scan image of abdomen that show left Psoas abscess on initial presentation (A) and five days after percutaneous drainage under radiological guidance (B) showing re-