Plummer Vinson Syndrome: Fatal Progression in an African American Female

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Abstract

Introduction: Plummer Vinson syndrome (PVS), involving a triad of iron deficiency anemia, esophageal webbing, and dysphagia, has become exceedingly rare due to iron supplementation and improved nutrition. PVS is associated with early development of hypopharyngeal carcinoma. When PVS is diagnosed, serial monitoring is required to detect the development of malignant lesions.

Case: This case involves a 49 year old African American female who presented with dysphagia, severe iron deficiency anemia, and progressive dysphagia. An esophageal web and hypopharyngeal mass were soon discovered. The patient was without any other known risk factors for cancer. She received chemotherapy and radiation treatment, but had an extremely aggressive recurrence of disease and passed.

Discussion: Although the diagnosis of PVS is infrequent it must be accurately ruled out, because it is associated with significantly higher rates of hypopharyngeal carcinoma. Patients with iron deficiency anemia and dysphagia should undergo testing to evaluate for PVS, and if diagnosed, these patients should be monitored for the possible development of malignancy.

INTRODUCTION

Plummer-Vinson Syndrome (PVS) is characterized by the triad of iron deficiency anemia, esophageal webbing, and dysphagia. The prevalence was once relatively common in certain populations, such as Scandinavian women in their fourth to seventh decades of life [1]. To date, the vast majority of reported cases remain Caucasian. Although the current incidence of this condition worldwide has plummeted, and correlates with nutritional improvements and iron supplementation, there remains a 9:1 female to male preponderance. Paradoxically, PVS is very rare in Africa where iron deficiency and malnutrition are prevalent throughout the continent. Whereas these medical factors should theoretically increase the risk for developing associated symptoms, the incidence of this disorder in this demographic population is extremely low [2]. In the early 20th century demographic data from Sweden demonstrated that 90% of females with hypopharyngeal carcinoma also had low blood iron levels [1]. Perhaps of greatest clinical significance is the fact that up to 16% of patients with PVS develop either hypopharyngeal carcinoma, esophageal carcinoma, or both, for reasons that are not clearly understood to date [2-6]. Thus, because of this notable potential for malignant transformation, early differential diagnosis is essential for two important purposes: First, to ensure the administration of individualized (type-specific) pharmacologic, nutritional, therapeutic, and surgical treatments to improve the clinical course, and second, to establish a future schedule of routine clinical and endoscopic examinations so as to improve the opportunity for early detection of suspicious lesions that require further work-up.

CASE PRESENTATION

The patient was a 49 year old African American female...
who presented to our emergency department with advanced microcytic anemia, dysphagia, and weight loss.

On initial otolaryngology consultation, she complained of frequent episodes of choking on solid foods and a globus sensation, both of which had been present for 5 months. Her BMI on admission was low at 17. She noted some recent weight loss, but added that she had always been thin. Significant lab values included hemoglobin of 4.4 as well as low mean corpuscular volume and high red cell distribution width, consistent with iron deficiency anemia. Although at first she denied a history of formal medical treatment for anemia, she later recalled that she had received a blood transfusion in the past. No active bleeding sites were identified. There was no previous history of tobacco, alcohol, or drug abuse.

Flexible fiberoptic laryngoscopy at bedside revealed a large mass in the right pyriform sinus, extending across midline with exophytic characteristics. The patient subsequently underwent imaging studies and triple endoscopy with biopsy. An esophageal web approximately 3cm inferior to the esophageal introitus was identified and dilated. Tracheostomy and percutaneous gastrostomy tube insertions were performed in the same operative session.

Figure 1 illustrates results of computed tomography demonstrating the aforementioned hypopharyngeal lesion. Pathologic diagnosis revealed invasive squamous cell carcinoma.

The case was discussed at our multidisciplinary head and neck tumor board. The tumor was staged as T2 N0 Mx. The consensus was to treat the patient with concurrent chemoradiation therapy. The patient also received a blood transfusion and iron therapy, with good response. She was subsequently discharged for the recommended treatment regimen. She completed her course of intervention modulated radiation therapy (IMRT) over 2 months, with an accumulated dose of 5000 cGy over 25 fractions; a second round of 8 fractions (1600 cGy) was administered in the subsequent two weeks. Throughout this treatment program the patient concurrently received 4 cycles of carboplatin, 5-fluorouracil and Erbitux.

Three months post-treatment the patient was tolerating all foods by mouth and she tolerated 24/7 tracheostomy tube capping without difficulty. PET/CT at that time had no findings to suggest an active malignant process. She was thus decannulated and the PEG tube was removed. Endoscopy revealed residual edema of the supraglottic structures without glottal abnormalities; the hypopharyngeal mass was not visually evident. The patient was followed monthly with no recurrence of symptoms until she missed her 6th monthly post-treatment visit. At her 7th monthly post-treatment visit she returned to clinic with complaints of moderate dysphagia and mild dysphonia. Visualization with flexible fiber optic laryngoscopy at that time was concerning for tumor recurrence. MRI imaging, triple endoscopy and biopsy, tracheostomy placement, and PEG tube insertion were performed. Results of the biopsy demonstrated disease persistence. As shown in Figure (2), the MRI revealed the tumor apparently abutting the pre-vertebral fascia with no invasion.

The patient was presented at tumor board for a second time. The tumor was staged at T4 N1 Mx. Surgical salvage was recommended, consisting of total laryngectomy and partial pharyngectomy. During salvage surgery, the tumor was determined to be tethered to the pre-vertebral musculature and un-resectable. Her tumor had progressed relatively quickly. As a result, the planned surgery was aborted and the patient instead received palliative chemoradiation consisting of 3 doses of Altima 500 per meter squared IV over a 3 week cycle. One month later she succumbed to her disease, 21 months after initial presentation to the emergency department.

DISCUSSION

Over the past few decades the incidence of PVS has significantly decreased, perhaps as a result of greater awareness of the importance of proper nutrition and iron supplementation to exact a full and balanced oral diet. Our case represents a strong
reminder that notwithstanding the low incidence of this disease, the diagnosis is still quite relevant. Of possible interest is the fact that although PVS mostly occurs in Caucasian females (with most studies originating from Scandinavian countries), our patient was of African American decent. Her diagnosis of PVS was made by the presence of iron deficiency anemia and dysphagia with esophageal webbing. A malignant hypopharyngeal mass was unfortunately already present, and with the absence of a history of smoking or alcohol abuse, was undoubtedly due to PVS. As previously mentioned, patients with this diagnosis possess an inherently increased risk for the development of hypopharyngeal carcinoma [4-7]. We have speculated whether or not our patient’s hypopharyngeal malignant degeneration could have been prevented had she received appropriate and ongoing medical care and treatment from the onset of her signs and symptoms of PVS. Whereas we will never know the answer to these clinical thoughts, the world literature would suggest that most patients generally benefit from iron repletion and nutritional therapy, esophageal dilation when necessary, and swallowing rehabilitation exercises; that esophageal or hypopharyngeal malignant progression of this disease is uncommon when signs and symptoms are promptly diagnosed and treated.

In our clinical practices, 1) patients presenting with anemia are always queried about any signs or symptoms of dysphagia; 2) patients presenting with dysphagia are routinely evaluated for any signs of anemia; and 3) patients diagnosed with PVS are closely followed and examined on a regular basis for signs of head, neck and esophageal malignancies. Through early detection of signs and symptoms of anemia (eg., glossitis, angular chelitis, pallor of conjunctiva and mucus membranes, and koilonychia), and dysphagia (eg., progressive weight loss, regurgitation, and intolerance of solids) physicians can be on high alert for the diagnosis of PVS. Such differential sensitivity should lead to comprehensive appraisal of the esophagus and hypopharynx via routine endoscopic examinations and referral for a contrast fluoroscopic swallow evaluation. It has been recommended that patients with PVS undergo such periodic examinations, even in the presence of an iron supplementation program and no active symptoms or signs of disease transformation [8-10]. We are not uncomfortable scheduling our patients for routine head and neck clinical endoscopy in the office setting every 4 months, or sooner if necessary. However, we defer referrals for repeat radiographic swallow studies unless absolutely indicated by new signs or symptoms of dysphagia, owing to the inherent hazard of radiation exposure. Such a surveillance calendar is driven by our awareness that early identification of hypopharyngeal carcinoma in this high risk population can result in a 5 year survival rate of 50% or greater.

In conclusion, this case study draws attention to PVS in the differential diagnosis of an African American female patient whose anemia and dysphagia degenerated into a fatal condition, perhaps as a consequence of insufficient medical care from the onset of her salient signs and symptoms. For other patients with similar symptomatic histories, routine endoscopic laryngeal and hypopharyngeal examinations, and fluoroscopic barium esophagram swallow studies, should be conducted with hopes of early diagnosis, appropriate treatments, and improved prognosis for disease free survival.

REFERENCES