CASE REPORT

Case study of an oncological emergency: Superior Vena Cava Syndrome (SVCS)

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ABSTRACT

Superior vena cava syndrome (SVCS) is an oncological emergency. It is expected that the incidence of SVCS may rise with the increase in usage of central lines for both oncological and non-oncological reasons. The authors of this article present a case study in which a 56-year-old female patient presented at the emergency department with a three-week history of facial swelling, significant hearing loss, unrelenting cough, hoarseness, and swelling of the arms, chest and upper back. A CT scan demonstrated total occlusion of the superior vena cava, confirming SVCS. In this case report, the authors present a discussion of the causes of SVCS, its clinical presentation in relation to this patient’s history, and the intervention provided to this patient.

Superior vena cava syndrome (SVCS) is recognized as a potentially life-threatening, acute, oncological emergency (Gabriel, 2012). SVCS can potentially indicate the warning signs of a new pathology in patients with a history of cancer, particularly cancers involving the chest (Crispo, Fidalgo, Fix, & Higgins, 2012; Kostopoulou, Tsiatas, Kelekis, Dimopoulos, & Papadimitriou, 2009; Szerlip, Singh, & Luft, 2011). While Canadian statistics could not be located, the incidence of SVSC in the United States has been cited as 15,000 cases per year (Landis, Bohanes, & Kohler, 2009).

This case study of a patient developing SVCS is offered because of its unexpected development in a patient who had suffered from a prolonged chest cold and cough in the two months leading up to the diagnosis of SVCS. The chest cold/sinus infection symptoms clouded the clinical presentation of SVCS in this client. No case studies similar to this one could be found; therefore, the authors felt that it was worthy of sharing with the medical community.

LITERATURE REVIEW

Facial swelling, along with “upper extremity swelling, facial plethora, headache, hoarseness, visual disturbance, or mental status changes” (Szerlip et al., 2011, p. 78) are among the most commonly reported signs and symptoms of SVCS. Rice, Rodriguez, and Light (2006) examined 78 patients in an effort to determine whether the signs and symptoms of SVCS were different in patients with malignancies compared with those patients with a benign etiology as the cause. They determined that the most common sign was facial and/or neck swelling and there was no statistical difference between the two groups. The most common malignancy-related cause of SVCS in their population was bronchogenic carcinoma. The majority of benign causes were related to the use of “intravascular devices” (Rice et al., p. 38).

CLINICAL PRESENTATION

Andris and Krzywda (1999) described intravascular device occlusions according to etiology: mechanical, nonthrombotic, and thrombotic. Mechanical occlusions can be caused by a number of factors such as malposition of the catheter, kinking of the catheter or tubing, or possibly a suture holding the catheter too tightly. Nonthrombotic occlusions can occur from lipid deposits or precipitate occlusions inside the catheter lumen.

Wingerter (2003) reported on two types of catheter-related thrombotic occlusions. These occlusions are inside the lumen (intraluminal) or outside the lumen (extraluminal). Intraluminal thrombus, which can occur within the lumen of the catheter or the reservoir of a PORT, can occur when “fibrin or blood products build up inside the lumen of the catheter” (p. 345). Extraluminal thrombus, found on the exterior of the catheter, may “include fibrin tails, fibrin sheaths, or mural thrombi” (p. 345). Thrombi may form and manifest differently with respect to accessing, administering medications through or obtaining blood samples from the PORT. However, it is important to identify the problem with the catheter and to take corrective action.

The 56-year-old female patient of this case study (and the first author in this article) developed SVCS. The individual’s PORT had been inserted nine months prior to the development of SVCS to facilitate administration of chemotherapeutic medications to treat Follicular Lymphoma. The patient had a history of asthma, pulmonary sarcoidosis, sleep apnea, and a recent upper respiratory infection requiring treatment with oral and intravenous antibiotics and steroids.
Even though the patient had been experiencing an exacerbation of asthma with a chest cold, the first sign that caused her concern was when she awoke with a swollen face that included swelling of the tongue and lips (Figure 1 [Day 1] and Figure 2 [Day 2]). She initially thought she was having an allergic reaction to the antibiotics she had been taking for a chest infection. She continued to awaken with progressively worsening swelling involving the face, right arm, then the left arm, chest, neck and upper back during the subsequent 14 days (Figure 3 [Day 4] and Figure 4 [Day 14]). She presented with significant nasal congestion and she reported that she had lost approximately 80% of her hearing. A persistent non-productive cough plagued her day and night. The patient experienced episodes of syncope after prolonged coughing for the last five days prior to admission. Red striae covered her upper chest and back. For the five nights before admission to hospital, she slept upright in a chair because of the severe dyspnea she experienced whenever she tried to lie down. Her weight increased by almost 30 pounds in 18 days.

**DIAGNOSIS AND TREATMENT**

On presentation to the emergency department on the day of admission, vital signs were normal. Blood work, electrocardiogram (ECG), and chest x-ray were all within normal limits. A CT scan of the chest revealed a total occlusion of the superior vena cava (Figure 5).

Interventional radiology (IR) was consulted and the patient was transferred to the IR suite. Following informed consent, conventional venography was performed, which demonstrated complete occlusion of the superior SVC with thrombus extending into the proximal portions of the brachiocephalic veins bilaterally (Figure 6). Catheter-directed thrombolysis was initiated with a 2 mg t-PA bolus (Cathflo, Genentech, San Francisco, CA) followed by a 1 mg/h t-PA infusion over three hours. A recheck venogram demonstrated significant residual clot. The PORT was removed. Mechanical thrombolysis was performed using mechanical aspiration and angioplasty following which only a small amount of residual clot remained in the proximal left brachiocephalic vein (Figures 7 & 8). This was not felt to be flow-limiting and the patient was returned to the floor in stable condition. The patient was discharged home on subcutaneous Lovenox 100 mg twice a day for three months.

Within six days post intervention, the patient reported a total weight loss of 30 pounds (Figure 9). A repeat CT scan performed four months later demonstrated no residual clot within the SVC or brachiocephalic veins (Figure 10). One year post intervention, the patient remains well. She remained on maintenance chemotherapy with rituximab every three months for two years for treatment of Follicular Lymphoma. Chemotherapy was continued via peripheral venous access.
**IMPLICATIONS FOR NURSING**

Registered nurses are most often the first person to triage patients who present to the emergency department of a hospital. A thorough history that includes questions regarding past medical conditions and the presence of a central line will alert the registered nurse to the possibility of SVCS. In addition, registered nurses who are aware that a sudden onset of upper body swelling is indicative of a potential problem with venous return to the superior vena cava can alert the physician to the possibility of a chest pathology that may have been previously undetected. Early detection and intervention could potentially save a patient’s life.

**CONCLUSION**

This case study was unusual in that prior to developing SVCS, this patient developed a severe sinus infection and chest cold which, ultimately, distorted her clinical picture when presenting to health professionals in the weeks leading up to diagnosis. It is important to look beyond the obvious in a patient’s clinical presentation to consider possible alternate diagnoses, especially in a patient with a history of cancer and/or one who has a central line. SVCS is an oncological emergency. Prompt diagnosis and intervention can facilitate a patient’s rapid return to health.

**REFERENCES**


