



Case Report

Blue plaque on the chest: A sign of systemic disease[☆]A. Kelsey^{*}, J. Bordelon, B.R. Tendler, M. Rothe

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Case presentation

An 83-year-old woman presented to the dermatology clinic for her annual full body skin examination. She had a medical history of hypertension, coronary artery disease, hypercholesterolemia, anxiety, Hashimoto's thyroiditis, gastroesophageal reflux, osteoarthritis, and actinic keratosis. The patient had no complaints or concerns about her skin other than a casual mention of a blue-tinted discoloration on her chest, which she noted had been present for several months and was gradually worsening.

The patient's surgical history included prior coronary artery bypass grafting (CABG) 5 years ago, hysterectomy, left knee replacement, and removal of benign breast tumors. She was a retired entrepreneur who did not smoke, drink alcohol, or use illicit drugs. Her medications included low-dose aspirin, losartan, furosemide, fluvastatin, omeprazole, oxazepam, potassium chloride, metoprolol succinate, and vitamins C and D. She was allergic to atorvastatin, chlorthalidone, ciprofloxacin, clarithromycin, latex, lorazepam, temazepam, and trazodone. Her family history included a daughter with thyroid cancer and ovarian cancer. A review of her systems revealed recent shortness of breath, cough, an inability to wear her necklaces because they had become too tight, and a change in the quality of her voice.

Examination

A physical examination revealed a fair-skinned woman (Fitzpatrick skin type II) with numerous dilated blue vessels across the anterior mid-chest (Fig. 1). The blue/purple tortuous plaques were soft, compressible, and did not pulsate upon palpation. She also had well-healed scars on her mid-chest, lower abdomen, and left knee. The patient's blood pressure was 128/82, pulse 67 and regular, and respirations 16. Her lower extremities revealed peripheral 1+ pitting edema and she stated that her neck seemed to be more swollen than normal. No lymphadenopathy was observed. Interestingly, the physical examination demonstrated Pemberton's sign as she experienced facial plethora upon elevation of both arms.

The findings in the examination were a concern for a venous obstruction. However, due to the proximity to the patient's CABG scar (Fig. 1), sequela from the surgery could not be ruled out.

Workup and treatment

A computed tomography (CT) scan revealed a heterogeneous, lobular, irregular mass at the lower thyroid pole that measured 7.1 cm by 6.0 cm by 7.6 cm. The tumor demonstrated extension into the perivascular space and invasion between the major branches of the aortic arch. There was evidence of a deviated trachea, impingement of the esophagus, and shifting of the esophagus to the right. The subclavian vein appeared markedly compressed and the left carotid was deviated by the tumor.

[☆] Conflicts of interest: None.

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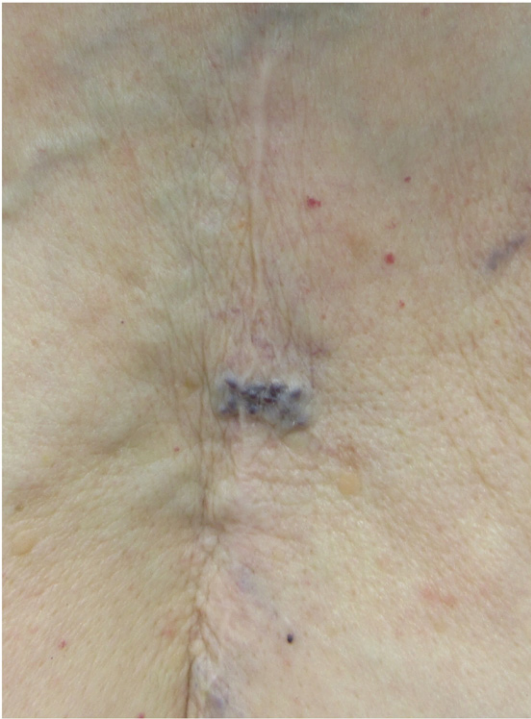


Fig. 1. Pre-operative presentation. Clinical photograph showing numerous dilated blue vessels across the anterior mid-chest. These vessels sit in close proximity to a scar from a previous CABG.

The patient underwent an ultrasound-guided core biopsy of the thyroid mass, which demonstrated findings consistent with papillary carcinoma showing hobnail morphology. The tumor was positive for the BRAF V600E mutation. Surgery was recommended for removal of the tumor and relief of the venous obstruction. Prior to the surgery, a CT angiogram of the chest was performed and revealed a complete obstruction of the subclavian vein with close proximity of the tumor to the left internal mammary artery. The extent of the disease resulted in a challenging surgical case. After removal of the tumor, the venous congestion was relieved and the blue plaque resolved (Fig. 2). A total thyroidectomy with neck dissection was performed. Due to the extent of the tumor, the right recurrent laryngeal nerve was sacrificed and the patient experienced a difficult postoperative period with many challenges while weaning from the ventilator. She was treated with adjuvant radioactive iodine-131 and eventually recovered.

Discussion

Thyroid carcinoma is the most common malignancy related to the endocrine system. Patients with differentiated tumors such as papillary thyroid carcinoma (PTC) have a good prognosis when identified at an early stage of the disease (Jameson et al., 2015). PTC is the most common type of thyroid cancer and represents 70 to 90% of well-differentiated thyroid cancers. PTC is 1.9 to 3.6 times more common in women (Aschebrook-Kilfoy et al., 2011) and the tumors tend to be multifocal and invade locally within the thyroid gland, through the thyroid capsule, and into adjacent structures in the neck. There is a tendency for lymphatic spread but hematologic metastasis is also possible. Common sites of spread include the lungs and bones (Jameson et al., 2015).

This particular case demonstrated hobnail morphology, which describes a variant of PTCs that show high nuclear/cytoplasmic ratios and apically placed, sometimes grooved nuclei that create a surface bulge. This bulge leads to the term “hobnail” (Asioli et al., 2010).

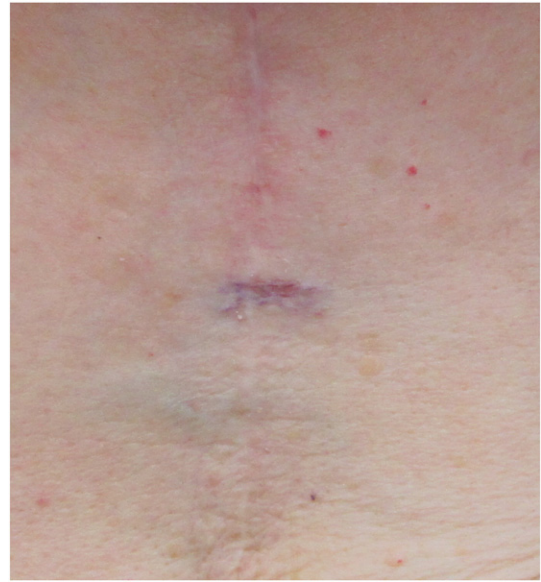


Fig. 2. Post operative presentation. Following the removal of her thyroid tumor the venous congestion was relieved. This post-operative photo, in contrast to Fig. 1, highlights relief of the venous congestion due to the tumor obstructing vessels.

Generally, the approach for a patient with a thyroid nodule starts with thyroid function tests followed by local imaging with an ultrasound. An ultrasound-guided fine needle aspiration is performed to make a tissue-based diagnosis. This technique is particularly useful for the diagnosis of PTC when compared with the diagnosis of other thyroid malignancies (Jameson et al., 2015).

Nodules that are suspected of malignant cytology should then prompt an ultrasound of the cervical lymph nodes. Treatment options include a thyroid lobectomy with intraoperative frozen sections, total thyroidectomy, or a mutation analysis (particularly for BRAF V600E). The latter is diagnostic of PTC and requires bilateral thyroidectomy versus unilateral thyroid surgery or a lobectomy (Jameson et al., 2015). A recent meta-analysis that incorporated nearly 21,000 patients found that the BRAF V600E mutation was associated with aggressive clinical pathological features, including local extra thyroid extension, higher tumor/node/metastasis stage, lymph node recurrence, and reduced overall survival. However, there was no significant association between mutation and distant metastasis (Liu et al., 2016).

After surgery, the patient was treated with iodine-131 as adjuvant treatment. Thyroid follicular cells preferentially take up iodine in both healthy and malignant tissue. The use of radioactive iodine destroys the remaining microscopic foci of disease as well as both local and distant metastases. In addition, the treatment subsequently enhances the specificity of future scanning for the detection of recurrent or metastatic disease by eliminating the uptake of normal thyroid tissue (Kwatampora et al., 2016). Studies suggest that radioiodine ablation decreases disease-specific, long-term mortality in patients with primary tumors that are >4 cm in diameter with either metastatic or locally invasive disease at the time of presentation (Kwatampora et al., 2016; Mazzaferri and Jhiang, 1994).

However, our patient had a CT scan that included a visualization of the neck structures. Thus, analyses of the size of the mass, its relationship to neighboring structures, and the surrounding lymph nodes were possible via this one test. The severe impingement of the thoracic and neck vessels by the patient's thyroid cancer resulted in a picture that was analogous to that of a patient with superior vena cava (SVC) syndrome. Although the SVC itself was not compressed, there was compression of many of the important surrounding

vessels. SVC syndrome is considered an oncologic emergency and the venous obstruction faced by our patient was also worthy of immediate attention.

Common manifestations of a thoracic venous obstruction include edema of the head, neck, or upper extremities plus various respiratory symptoms (Yellin et al., 1990). Patients can have pulmonary complaints that consist of cough, dyspnea, hoarseness, dysphagia, chest pain, and even hemoptysis. However, in one study, the most common finding in 85.7% of patients was visible venous congestion of the head and neck (Yellin et al., 1990).

Cutaneous manifestations of a venous obstruction often present early and can include serpiginous or tortuous superficial dilated vessels on the anterior chest that reside superior to the ribcage margin (Ratnarathorn and Craig, 2011). Superficial, dilated vessels that are present below the ribcage margin are usually related to the varices of portal hypertension or chronic liver disease, which are termed “caput medusa” (Sharma and Raina, 2015).

A prompt diagnosis of thoracic venous congestion or SVC syndrome is necessary to avoid further congestion and related complications. Continued vessel compression can lead to a compromise of the larynx, pharynx, esophagus as well as venous pressure in the head, neck, and upper extremities (Swanson et al., 1968). Severe complications include respiratory distress and debilitating cerebral edema (Ratnarathorn and Craig, 2011). The management of venous congestion primarily consists of treating the patient's underlying disease, which will result in a symptomatic improvement of the condition's manifestations.

Conclusion

Our patient presented to the dermatology clinic with an incidental finding of dilated, tortuous, blue superficial vessels on her anterior chest wall. Her symptoms of cough, dyspnea, and neck swelling as well as the findings during the physical examination were concerning. Further imaging revealed a thyroid tumor with an extension into surrounding areas causing vessel obstruction. A biopsy test

result showed papillary thyroid carcinoma. A prompt diagnosis allowed for a timely surgical resection of the tumor and increased the patient's odds of long-term survival. The congestion resolved postoperatively.

It is important that all physicians are aware of the possible implications related to dilated chest wall veins that are observed during a physical examination. Dermatology providers may be the first to diagnosis this condition, which presents an opportunity for further exploration.

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