CLINICAL VIGNETTE

Lancisi's Sign as the Presenting Finding of a Carcinoid Tumor

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A 65-year-old male with a history of rheumatoid arthritis, pulmonary hypertension, and stage I small cell lung cancer status post cryoablation presented with a chief complaint of failure to thrive. He was seen in rheumatology clinic earlier that day for routine follow up of his rheumatoid arthritis. His rheumatologist noted a 40lb weight loss in the last 6 months and referred him to the hospital for further evaluation.

The patient's only subjective complaint was mild fatigue and dyspnea on exertion. He denied any orthopnea, syncope, or chest pain. He attributed his weight loss to a lack of appetite and did not report any nausea, vomiting, constipation, or diarrhea. Physical exam demonstrated bounding neck pulsations and a holosystolic murmur heard at the left sternal border, louder on inspiration as well as bilateral dry crackles in his bilateral lung bases and two plus pitting edema over his lower extremities. The neck pulsations were extremely prominent, with a dominant monomorphic undulating pulsation largest near the clavicles that radiated up to the earlobes bilaterally. This finding of giant v-waves (or c-v waves) is known as Lancisi's sign and is indicative of severe underlying tricuspid regurgitation.

A transthoracic echocardiogram confirmed severe tricuspid regurgitation with elevated estimated right heart pressures and normal left ventricular function. Right heart catherization showed elevated right heart pressures with normal left sided pressures. The right atrial waveform demonstrated a-waves with the x-descent masked by giant c-v waves, with pulsatile pressure of 24/14 mmHg. Transesophageal echocardiography showed a degenerative valve appearance and torrential tricuspid regurgitation with restricted mobility of all three leaflets. Initially, the tricuspid regurgitation was thought to be secondary to suspected Group III pulmonary hypertension given the patient's known lung pathologies. However, given the valvular degeneration and restricted mobility, primary causes such as Carcinoid Syndrome were also considered. A 24-hr urine five hydroxy-indole acetic acid (5-HIAA) was elevated at 134mg/24hr (reference range 2-7mg/24hr). The patient received a transcatheter tricuspid valve replacement with complete resolution of his tricuspid regurgitation, clinical Lancisi's sign, and his holosystolic murmur. CT enterography was then able to identify a 1.7cm x 1.6cm mass in the distal small bowel, consistent with a carcinoid tumor. Metastatic lesions were also found in the liver and mediastinum. The patient and his family declined enteroscopy and biopsy given his multiple co-morbidities and poor overall prognoses. Unfortunately, the patient died about one month after discharge.

Discussion

This case provides multiple useful lessons for internists. With a vague chief complaint such as "failure to thrive," the differential is incredibly broad. A key physical exam finding can guide our initial approach to the undifferentiated patient.[1] In this case, the neck exam provided an easily visible indication of underlying tricuspid regurgitation. Further invasive diagnostics and imaging, such as the transesophageal echocardiogram and the right heart catherization, mainly served to confirm and quantify what we were able to deduce from the physical exam.

This case also highlights the utility of understanding the jugular venous pressure waveform and assessing it at the bedside. On first glance, a primarily monophasic neck pulsation may be interpreted as an arterial carotid pulse, as normal JVP waveforms are typically biphasic with an a-c wave followed by a v-wave. What is usually more prominent on inspection of the neck are the inward motions of the jugular veins (external and Internal) generated by the x and y descents. However, in the case of underlying pathology such as tricuspid regurgitation, this pattern can change such as in Lancisi's sign.

Normally, three peaks and two troughs characterize the venous waveform (see graph 1 of normal findings, for comparison). The first peak is called the 'a' wave and results from atrial contraction at the end of diastole. Next, just before systole begins, isovolumetric ventricular contraction raises the pressure in the right ventricle and closes the tricuspid valve (TV). This upward momentum then pushes the TV into the right atrium producing the smaller 'c' wave. In mid-systole, given a normal tricuspid valve, a combination of atrial relaxation and downward motion of the atrial floor during ventricular contraction results in the 'x' descent or first trough. The third peak, or 'v' wave, is due to progressive atrial filling during late systole. To round out the cardiac cycle, passive ventricular filling in early diastole produces the 'y' descent or second trough.

In patients with tricuspid regurgitation, retrograde blood flow into the right atrium during ventricular diastole (predominantly red doppler signal on lower left panel of image 1) results in loss of most of the x descent (see graph 2), creating a fused 'cv' wave that appears as a large outward pulsation within the internal jugular vein that is often palpable (see lower right

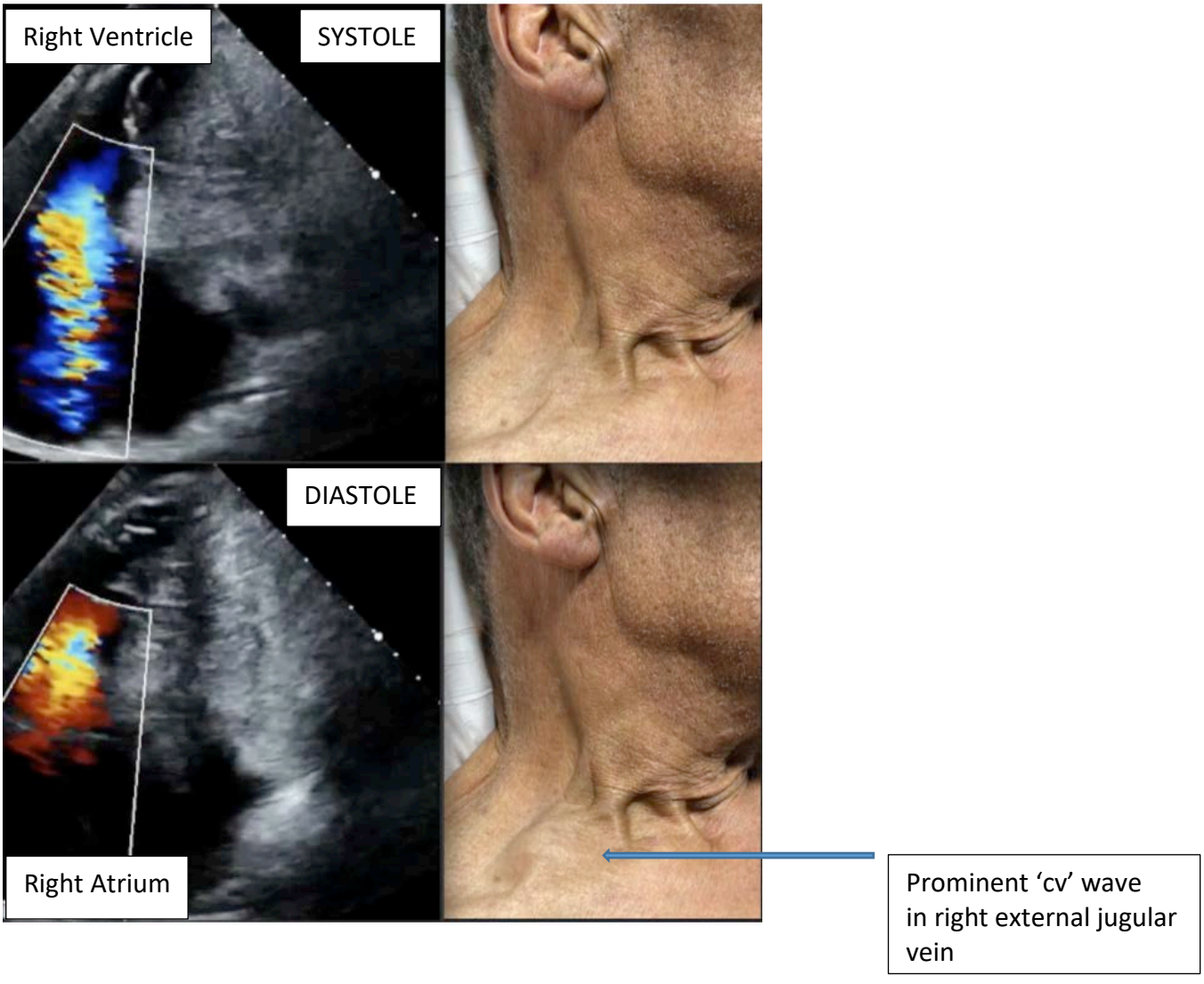
image 1). This wave is typically followed by an augmented ‘y’ (graph 2) descent, which is the consequence of an increased pressure gradient between the right atrium and right ventricle. The upper panels in Image 1 represents ventricular systole with flattening of the external and internal jugular veins on the right side of the neck. The upper left panel shows predominantly blue color doppler flow of blood from right atrium into right ventricle.

Our patient did not exhibit any classic symptoms of carcinoid syndrome including facial flushing, nausea, or diarrhea.[2] Cardiac symptoms can be the initial presenting symptoms in 20% of patients with carcinoid syndrome.[3] Typically, cardiac carcinoid involvement is right-sided with tricuspid valve regurgitation and pulmonary valve stenosis, possibly progressing to right heart failure. However, left-sided cardiac involvement is still possible.[4]

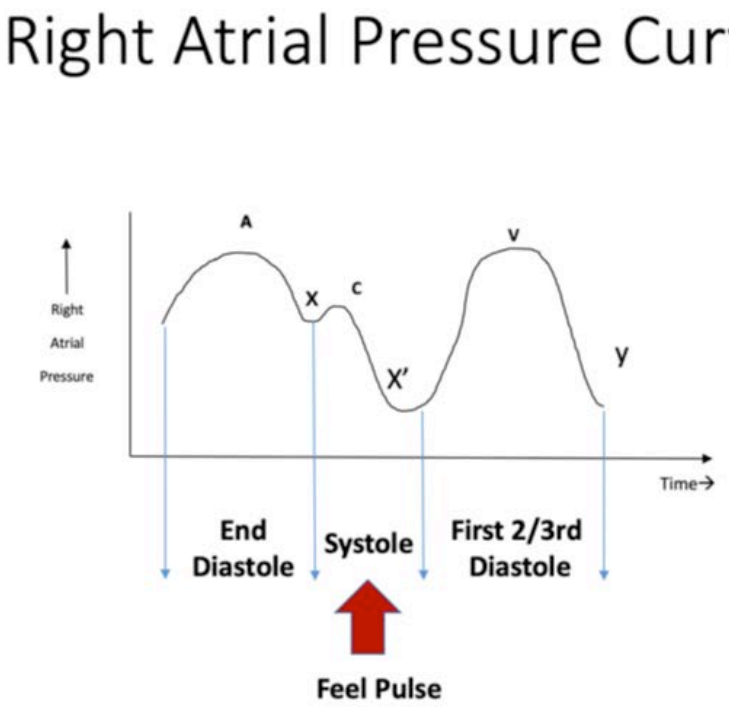
Interestingly, one can use the prominent neck pulsation (giant v wave) over the right external jugular vein during early diastole to help diagnose severe tricuspid regurgitation at the bedside. If one recognizes Lancisi’s sign, the lower left sided holosystolic murmur that gets louder on inhalation (Carvallo's sign) should be audible in systole and confirmed by palpation of the carotid upstroke higher in the neck. With the progression of the cardiac cycle one will see the right external and internal jugular bulge in early diastole. To round out the physical findings of severe tricuspid regurgitation at the bedside, one might also expect systolic flow reversal in the hepatic veins to manifest as a palpable pulsatile liver, however this was not seen in our patient.[5]

A nuanced understanding of jugular venous pulsations can aid clinicians in the bedside assessment of patients with symptoms concerning for underlying cardiovascular disease. Lancisi’s sign is associated with severe acute tricuspid regurgitation, which can be a systemic complication of Carcinoid Syndrome as was seen in our patient.

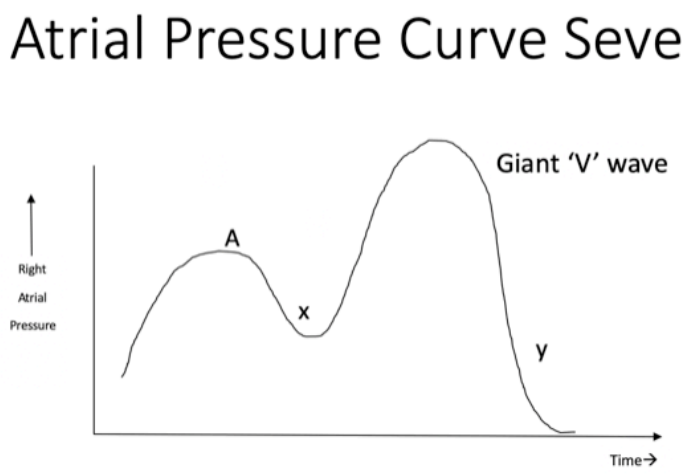
Image 1. 4 chamber echocardiogram of heart, with doppler flow correlating with right side of patients neck.



Graph 1.



Graph 2.



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