

## CASE REPORT

# Superior Vena Cava Syndrome vs Ludwig's Angina: A Diagnostic Dilemma

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## ABSTRACT

**Introduction:** We present an interesting diagnostic dilemma between superior vena cava syndrome and Ludwig Angina to highlight ways to differentiate between these two seemingly similar conditions.

**Presentation of case:** A 50-year-old man presented with complaints of progressive breathing difficulty with diffuse brawny swelling in the neck and clinically gave impression of Ludwig angina, however, on further evaluation was diagnosed with superior vena cava syndrome (SVCS) secondary to non small cell carcinoma of lung.

**Discussion:** This paper illustrates an interesting scenario in which clinical presentation of SVCS mimicked Ludwig's Angina. SVCS with a gradual onset may have minimal symptoms with facial edema, erythema and venous distension in the chest and neck. Occasionally atypical presentation of Ludwig's angina may mimic SVCS where high degree of clinical suspicion is needed to discriminate them.

**Conclusion:** Superior vena cava syndrome may present with symptoms suggestive of Ludwig's angina, especially if the obstruction is slowly progressive. A high index of suspicion is necessary in these cases.

**Keywords:** Ludwig's angina, Superior vena cava syndrome, Adenocarcinoma, Bronchoscopy.

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**Conflict of interest:** None

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## INTRODUCTION

In an emergency situation, wherein the stakes are of life and death, a few conditions can mislead the ENT surgeon. Here, we present a diagnostic dilemma. Ludwig's angina is a rapidly progressing soft-tissue infection of the floor of the mouth,<sup>1</sup> while superior vena cava (SVC) syndrome is a constellation of symptoms and signs caused by obstruction to the SVC, usually leading to diffuse swelling of the neck and face accompanied by breathing difficulty.<sup>2</sup> Yet, in the emergency room, these two seemingly different conditions bear stark similarities with each other.

## CASE REPORT

A 50-year-old man with uncontrolled noninsulin dependent diabetes mellitus presented to the emergency department with complaints of progressive breathing difficulty and diffuse swelling of the neck of 4 days duration. He also had dull aching pain in the neck, mild facial swelling and intermittent pain on swallowing of 10 days duration. He also gave history of a tooth infection 2 weeks back. On examination, his vitals were stable, O<sub>2</sub> saturation was 98% on room air and he was afebrile on physical examination. He was not in stridor. There was a diffuse brawny swelling in the upper part of the neck extending up to the lower jaw (Fig. 1). There were no palpable lymph nodes in the neck.

Fibre-optic laryngoscopic examination revealed edema of the false cords but with no airway compromise. Chest X-ray revealed mild mediastinal widening which was reported by the radiologist as insignificant (Fig. 2). Ultrasonography of the neck revealed inflammatory changes and reactive lymph nodes, but no obvious pus collection.

In view of the diabetic status, history of tooth infection and ultrasound findings, a probable diagnosis of Ludwig's angina was considered. Patient was advised admission for intravenous antibiotics. However, he refused admission.

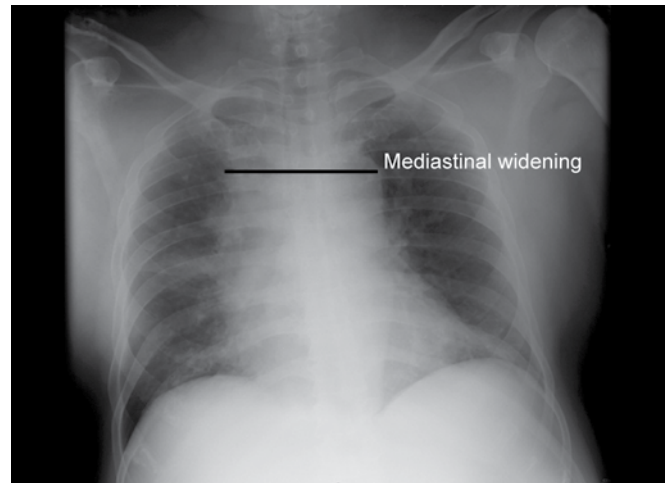
He presented to the emergency department 2 days later with increasing neck swelling and breathing difficulty.

He was posted for incision and drainage under general anesthesia.

After failed attempts at intubation a tracheostomy was done to establish the airway. Incision and drainage was done at the level of hyoid bone from one side of angle of mandible



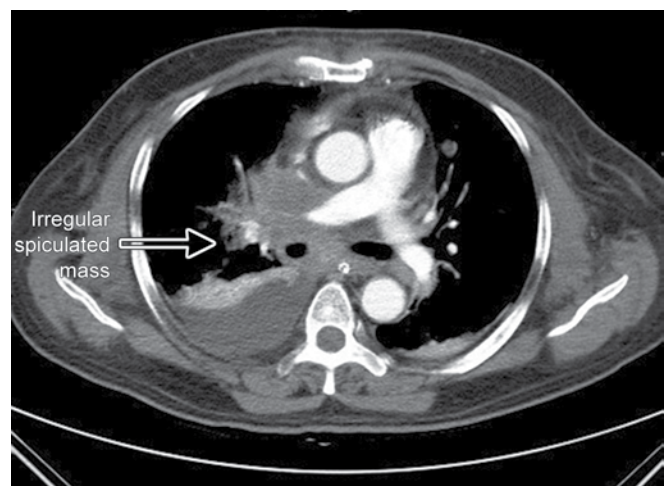
**Fig. 1:** Clinical picture of the patient



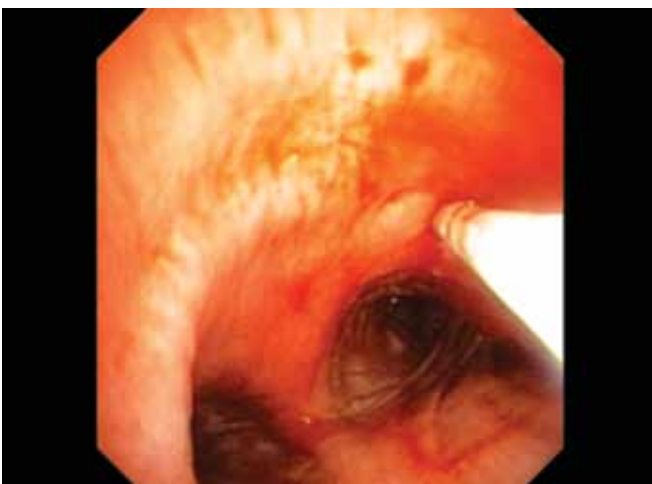
**Fig. 2:** Chest X-ray PA view showing mediastinal widening



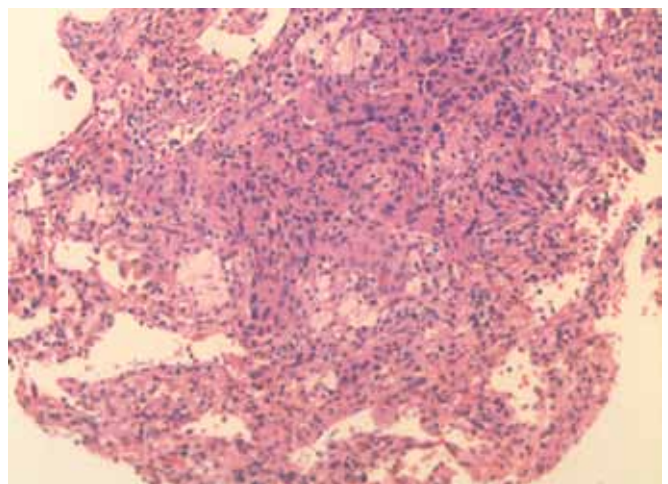
**Fig. 3:** Showing neck collaterals



**Fig. 4:** Irregular spiculated mass in right upper lobe involving SVC and azygous vein



**Fig. 5:** Bronchoscopic view of transtracheal needle aspiration of the paratracheal lesion



**Fig. 6:** Tumor composed of polygonal cells arranged in sheets and nests with moderate to abundant amounts of eosinophilic cytoplasm and round to oval mildly pleomorphic vesicular nucleus with prominent nucleoli

to other. The tissues looked healthy with no evidence of Ludwig's angina. The wound was primarily sutured and he was shifted to the surgical intensive care unit in view of

his general condition. A computed tomography (CT) scan of neck and thorax was done, which revealed an ill defined lung mass encasing the SVC (Figs 3 and 4) with SVC syndrome.



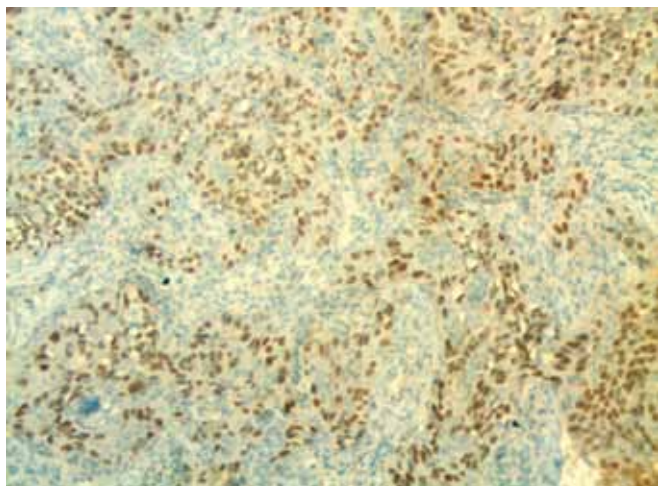


Fig. 7: Tumor cells are TTF-1 positive

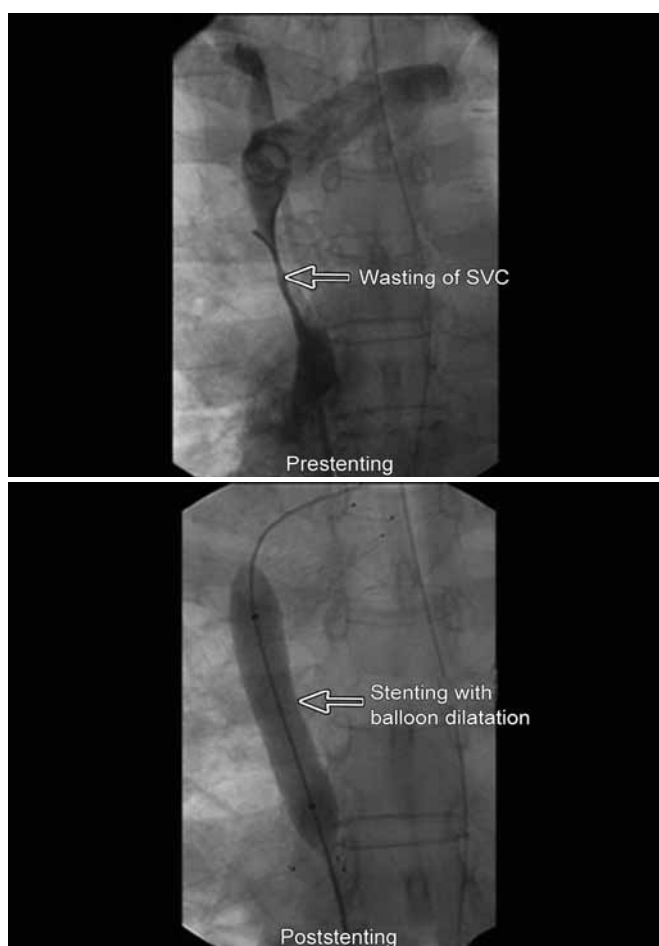


Fig. 8: Prestenting showing wasting of SVC and post-stenting dilatation

A bronchoscopic guided biopsy was done (Fig. 5) which was reported as nonsmall cell adenocarcinoma of the lung (Figs 6 and 7). Superior venacaval stenting was done successfully by interventional radiologists on fourth postoperative day (Fig. 8). His facial puffiness and his overall clinical condition improved.

He was transferred to medical oncology for further treatment.

## DISCUSSION

This paper illustrates an interesting scenario in which clinical presentation of SVCS mimicked Ludwig's Angina.

Wilhelm Friedrich Von Ludwig, a German physician, first described Ludwig's angina in 1836.<sup>3</sup> Ludwig's angina is a life-threatening cellulitis of the floor of mouth and neck; characterized by progressive submandibular swelling leading to elevation and posterior displacement of the tongue.<sup>4,5</sup> Spreading edema may cause airway compromise. Odontogenic infections are the source of infection in majority of the cases.<sup>3,6</sup> *Staphylococcus*, *Streptococcus*, and *Bacteroides* species are the most commonly cultured organisms.<sup>3,7</sup> The main stay of treatment is incision and drainage, removal of the focus of infection (most often caries teeth) and broad spectrum antibiotics.<sup>8</sup>

Superior vena cava syndrome is obstruction to the flow of SVC leading to increases in venous pressure, interstitial edema and retrograde collateral flow.<sup>9</sup> The major drainage vessel for venous blood from the head, neck, upper extremities, and upper thorax is the SVC. Hence, SVCS presents with a constellation of congestive symptoms. The most common clinical symptoms are facial edema, erythema and venous distension in the chest and neck. However, if adequate collateral drainage develops, the patient may have minimal symptoms.<sup>9</sup> The diagnosis of SVCS is often made mainly on clinical grounds, i.e. the combination of the clinical presentation and, often, a thoracic malignancy. If SVCS is suspected elevating both arms until they touch the sides of the head may result in congestion of the face, cyanosis and occasionally distress' (Pemberton manoeuvre).<sup>11</sup>

Malignant tumor is the most common cause of occlusion and stenosis of the SVC; out of which lung cancer accounts for approximately 70% of such cases.<sup>10</sup> Computed tomography is diagnostic and provides accurate information about the location and extent of the obstruction and about adjacent anatomical structures.<sup>9</sup> Reversal of flow in right subclavian vein and right juglar vein on Doppler ultrasonography is consistent with SVCS.<sup>9</sup>

Treatment of SVCS involves bypassing the obstruction of the SVC by percutaneous placement of an intravascular stent.<sup>12</sup> and treatment of the primary pathology.

## CONCLUSION

Superior vena cava syndrome may present with symptoms suggestive of Ludwig's angina, especially if the obstruction is slowly progressive. A high index of suspicion is necessary and a CT scan of the neck with thorax should be considered to differentiate the two. To avoid this diagnostic dilemma, we recommend following learning points:

## LEARNING POINTS

1. Patient with SVCS may present with neck swelling, and can mimic Ludwig's angina.
2. CT of the neck with thorax should be considered before any surgical intervention.
3. Presence of venous collaterals in CT neck should alarm clinician for SVCS.
4. Reversal of flow in right jugular vein flow on Doppler ultrasound is a strong indicator of SVCS.

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