

Left Internal Jugular Vein Thrombosis Due to a Lung Tumor

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Deep vein thrombosis is a common disease among Caucasians but is rare in Asia. Venous thrombosis may be fatal, for example by a pulmonary embolism and right or left atrial thrombosis. Alternatively, deep vein thrombosis may follow a benign pattern such as femoral and popliteal vein thrombosis. Theories abound regarding the causes of deep vein thrombosis, with the most common theories being long-term stasis and lack of exercise. Internal jugular vein thrombosis is a rare but potentially fatal disease with various causes. In the pre-antibiotics era, this disease was frequently associated with deep neck infection. Recently however, local trauma, central catheterization, and repeated intravenous injections with drugs have become the leading causes of thrombosis. Spontaneous internal jugular vein thrombosis may occur in connection with a neoplasm, termed Trousseau's syndrome. This investigation reports a case of lung cancer associated with internal jugular vein thrombosis. (*Chang Gung Med J* 2003;26:458-62)

Key words: internal jugular vein, thrombosis, neoplasm, lung cancer.

Venous thrombosis is a common problem, especially deep vein thrombosis involving the extremities. The pathophysiology of venous thrombosis has been fully described in Virchow's triad: endothelial injury (intimal), change in blood flow (stasis), and hypercoagulability of blood.⁽¹⁾ However, internal jugular vein thrombosis is a rare and potentially life-threatening condition. In the pre-antibiotics era, this disease was a well-known complication of head and neck infections such as tonsillitis, peritonsillar abscess, dental infection, and deep neck infection.⁽²⁾ Lemierre's syndrome, or postanginal sepsis caused by anaerobic oropharyngeal infection or necrobacillosis with septic thrombophlebitis of the internal jugular vein and multiple pulmonary emboli, is a rare but serious complication of the above conditions.⁽³⁾

Currently, the leading cause of internal jugular vein thrombosis is direct trauma to the vein. Such trauma can include central vein catheterization⁽⁴⁾ and

repeated injections into the large vein of the neck by intravenous drugs users.⁽⁵⁾ Such damage can also occur following cervical traction.⁽⁶⁾

Trousseau's syndrome is an occasionally noted paraneoplastic syndrome related to malignancy. Typically, venous thrombosis is confined to the venous systems of the extremities, and occasionally the viscera. However, internal jugular vein thrombosis may be secondary to an occult malignancy.^(7,8) This investigation reports a case of left internal jugular vein thrombosis occurring spontaneously with lung cancer, with a series of duplex follow-ups. Notably, the present case is the first such case to have been reported in Taiwan.

CASE REPORT

A 38-year-old man was admitted to the hospital with sudden onset of left neck swelling lasting 2 days. The patient had been well until 2 months

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earlier, when he began to suffer a persistent dry cough with progressive exertional dyspnea. No orthopnea, paroxysmal nocturnal dyspnea, or angina accompanied these symptoms. Additionally, the patient described experiencing body weight loss with a fair appetite, involving around 3 kg over 2 months. Two weeks before admission, the man went to a local hospital seeking help, and diffuse interstitial lung disease was diagnosed, with a chest X-ray revealing a bilateral reticulo-nodular pattern. The man was treated with antitussive agents and mucolytics for several days, but the treatment proved ineffectual. Two days before admission, the patient experienced sudden onset of left neck swelling with local heat and pain, especially upon spontaneous neck rotation. The patient denied experiencing fever, sore throat, or previous local trauma. The patient was admitted to our hospital.

The man worked in the construction industry where he had been subjected to high levels of silicon exposure for over 10 years. However, during the past 2 months, he had shifted to work in a computer-related company. The man had previously been a smoker, with a habit involving about half a pack a day and lasting 5 years, but he had quit about 10 years previously.

Upon admission, the patient had a temperature 36.9°C, a pulse 106 beats/min, and respiration of 20 breaths/min. His blood pressure was 110/71 mmHg.

General examination revealed local swelling, heat, tenderness, and erythematous change over the left neck without neck lymphadenopathy. The breathing sound was characterized by bilateral fine crackles. The heart sound was regular, without a murmur. Finally, the abdomen was soft and flat without organomegaly.

The results of laboratory tests were hematocrit of 44.9% (normal range, 41%-53%), white cell count of 8900 (3900-10,600)/mm³, neutrophils of 89% (42%-74%), lymphocytes: 8% (20%-56%), platelet count of 23,900 (150,000-400,000)/mm³, and creatinine of 0.9 (0.4-1.4) mg/dl. Head and neck computed tomography (CT) revealed left internal jugular vein thrombosis (Fig. 1). Furthermore, abnormal soft tissue infiltration was found over the left lung apex which may have compressed the lower portion of the internal jugular vein (Fig. 2). Finally, the chest X-ray displayed a bilateral reticulo-nodular pattern (Fig. 3).

In the emergency department, under the impression of internal jugular vein thrombosis without related deep neck infection, heparinization and penicillin were prescribed. Later, the patient was admitted to our ward.

Venous duplex of the neck was arranged, and revealed total occlusion of the left internal jugular vein (Fig. 4). On the 10th day after admission, venous duplex revealed evidence of resolution following appropriate anticoagulation. Additionally, the chest department was also consulted to determine the treatment for the interstitial lung disease. Various studies were performed over subsequent days.



Fig. 1 CT scan of the neck revealing thrombosis of the left internal jugular vein (black arrowhead).



Fig. 2 Chest CT. Abnormal soft tissue infiltration tumor can be noted over the left side apex of the lung (white arrowhead).

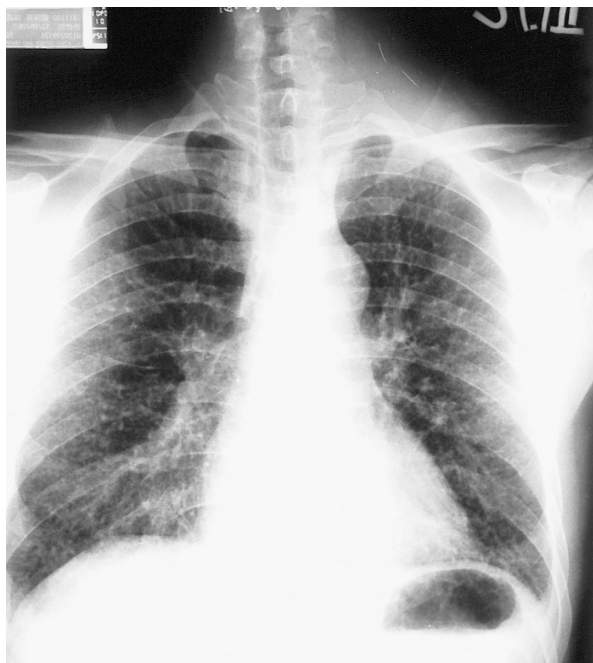


Fig. 3 Chest X-ray showing a bilateral reticulo-nodular pattern.

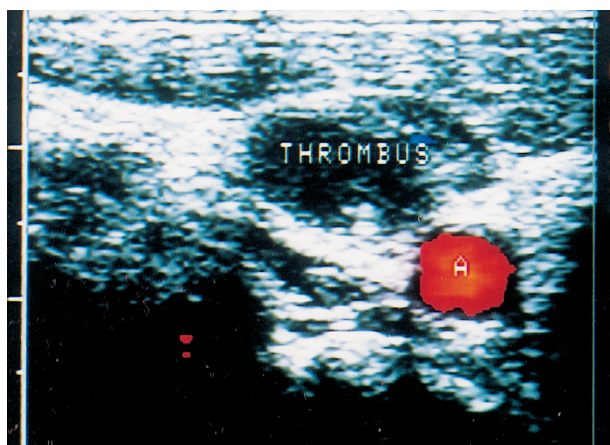


Fig. 4 Neck venous duplex. The total occlusion of the left internal jugular vein can be noted.

Pulmonary function testing indicated moderate lung restriction. On the 9th day after admission, a bronchoscope study with bronchial washing and a transbronchial lung biopsy was performed. Additionally, some tumor markers were checked, and revealed alpha-fetoprotein of < 3 (normal range, < 20) $\mu\text{g/ml}$, carcinoembryonic antigen of 1.51 (< 5) $\mu\text{g/ml}$,

and prostate-specific antigen of 0.24 (< 5) $\mu\text{g/ml}$.

Unfortunately, suspected malignancy (adenocarcinoma) was diagnosed based on bronchial washing cytology. Subsequently, a lung biopsy confirmed a poorly differentiated carcinoma.

On the 30th day after admission, progressive dyspnea with hypoxemia began. Accordingly, nosocomial pneumonia superimposed on lymphangitic carcinomatosis was suspected. Because of impending respiratory failure, the patient was transferred to a medical intensive care unit and intubated on the following day. On the 37th day after admission, sudden onset bradycardia with shock occurred, and the patient was discharged in a critical condition upon the family's request.

DISCUSSION

Internal jugular vein thrombosis is a rare condition. During the pre-antibiotics era, the major reason for this condition was head and neck infection. More recently, common causes of this condition have included central catheterization, intravascular (IV) drug use, and occasionally cervical traction-related and ovarian hyperstimulation syndrome.⁽⁹⁾ Since 1985, several studies have discussed internal jugular vein thrombosis associated with an occult malignancy.

Diagnosing internal jugular vein thrombosis requires a high degree of suspicion. In the differential diagnosis of a painful neck swelling or neck mass, deep neck infection, cellulitis, painful lymphadenopathy, and head and neck tumor with necrosis are commonly encountered causes. However, internal jugular vein thrombosis should be included in any list of causes, particularly where there is a history of previous head and neck infection, venous catheterization, or drug use.

The present patient displayed sudden onset of painful swelling of the left neck with local heat. The differential diagnosis for this patient included local infection, cellulitis, and internal jugular vein thrombosis because of its occurrence over several hours to days. Furthermore, no fever or signs of systemic inflammatory response syndrome were noted during this period of time, thus making internal jugular vein thrombosis the most likely diagnosis.

However, from the history of this patient, we knew that he was not an IV drug user and had not

received central venous catheterization before admission. Consequently, the etiology of internal jugular vein thrombosis merited further investigation.

Suspected internal jugular vein thrombosis can be rapidly diagnosed using duplex ultrasonography.⁽¹⁰⁾ Ultrasound has the key advantage of providing a bedside diagnosis, with high sensitivity and specificity, and may achieve superior resolution to CT in superficial areas. In the present patient, total occlusion of the left internal jugular vein was clearly identified using ultrasound, which also provided a convenient method for follow-up under anticoagulation therapy.

A CT scan and magnetic resonance image (MRI) can also be used for diagnosis. These methods are especially useful for excluding a local mass effect from an unsuspected malignancy. Furthermore, these methods can help identify the possible cause of internal jugular vein thrombosis. The CT of the present patient revealed abnormal soft tissue infiltration over the left lung apex which may have compressed the lower part of the internal jugular vein. One aspect of the pathophysiology of thrombosis in malignancy is venous stasis or abnormality of blood flow. Immobilization or bed rest or vascular compression by a tumor mass may cause venous stasis, which can delay the clearance of activated coagulation factors and cause venous valve damage due to hypoxia.⁽¹¹⁾

Accordingly, the etiology of internal jugular vein thrombosis in the present patient may have been related to vein compression. Generally, Trousseau's syndrome of the head and neck is a rare condition, because the veins in the head and neck are valveless, and have an elastic wall, allowing alternative collapse and expansion by the action through respiration and heart pumping. However, the D-dimer level (normal, < 2 µg/ml) was not initially checked, and thrombocytopenia, prolonged prothrombin time, and activated partial thromboplastin time were not noted. This work cannot exclude the possibility of chronic disseminated intravascular coagulopathy (DIC) related to Trousseau's syndrome. However, a D-dimer

level of >2 µg/ml for excluding pulmonary embolism owing to sudden onset of dyspnea was noted, and the data were thought to be related to nosocomial pneumonia, and not necessarily to indicate DIC.

The etiology of any deep vein thrombosis should be clarified, and an occult malignancy should not be missed.

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因腫瘤引起之左內頸靜脈栓塞

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深靜脈栓塞在西方人很常見，但在東方人身上卻不常見；靜脈栓塞可以是致命的，如肺靜脈栓塞；但也可以是良性的臨床表現，如下肢靜脈栓塞。造成深靜脈栓塞的原因，常與靜脈血的鬱積或是缺乏活動有關。而內頸靜脈栓塞在臨床上是一個罕見但會致命的情況，在抗生素發明之前，常與深頸部感染有關。然而，目前造成內頸靜脈栓塞的主要原因包括了局部創傷、使用中心靜脈導管和反覆的靜脈藥物注射。自發性的內頸靜脈栓塞可能與腫瘤有關，名為“Trousseau's syndrome”。在這篇文章中，我們將報告一個肺癌的病例以內頸靜脈栓塞來表現。(長庚醫誌 2003;26:458-62)

關鍵字：內頸靜脈，栓塞，腫瘤，肺癌。

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