Pancoast Tumor as a Cause of Profound Brachial Plexopathy

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ABSTRACT

Pancoast tumor is also called superior sulcus tumor. The classic presentation is an aching pain about the shoulder region with some radiation to the scapula and weakness in the intrinsic hand muscles unilaterally (C8-T1 distribution). This case report demonstrates a rare case of Pancoast tumor which involved the fifth cervical through the first thoracic nerve roots with pain and severe muscle weakness throughout the arm.

Keywords: Pancoast tumor, brachial plexopathy, C5-T1 distribution

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CASE REPORT

A 59-year-old right-handed policeman had an aching pain of the right shoulder region with some radiation to the arm, forearm and hand and developed numbness of the right hand later. He came to the orthopaedist and was diagnosed with cervical spondylosis with radiculopathy. He was treated with nonsteroidal anti-inflammatory medication and vitamin B. However, his symptoms did not improve and one month later he developed weakness of right upper extremity. Because his symptoms still had not abated, he returned to his physician who referred him to see a neurologist later. The neurologist diagnosed him with right brachial plexopathy and gave a referral to physiatrist for an electrodiagnostic consultation.

Upon further questioning during this interview the patient stated that he had poor appetite and had lost about 15 kilograms in three months. He had no underlying disease, and had no trauma or surgery before his symptoms occurred. Nevertheless, he was a heavy smoker (two packs per day) for thirty years and had drunk alcohol (about one bottle per day) for forty years. Physically the patient looked sick and cachexia. His blood pressure was 120/85 mmHg, body temperature was 36.4 degree celcius, pulse rate was 85 beats/minute and respiratory rate was 28 times/minute. Horner's syndrome was detected and the right supraclavicular lymph node could be palpated. He complained of a severe amount of a dull aching pain, primarily during attempts to move the affected shoulder and arm. Full passive range of motion could be done in all major joints and revealed flaccid tone of the right upper extremity. Active cervical motion was normal and did not exacerbate the pain. Manual muscle testing revealed grade 0/5 in all muscles of the right arm. The left upper extremity revealed a muscle grade of 5/5 throughout. Diminished sensation to pinprick and light touch was noted in the right upper extremity. Sensation in the left upper extremity was intact. Muscle stretch reflexes of the right biceps brachii, extensor carpi radialis and triceps were absent. No weakness, hyperreflexia, or abnormal tone was noted in the lower extremities. Previous medical examination demonstrated no evidence of cranial or cervical spine injury.

Nerve conduction studies were performed in the right upper extremity and needle electromyographic investigation was also performed by using a disposable monopolar needle. Summary of electrophysiologic findings included absent sensory response for the right radial, median and ulnar nerves, diffuse membrane instability and absent motor unit action potential for the right deltoid, biceps, triceps, flexor carpi radialis, flexor pollicis longus, first dorsal interosseous manus, infraspinatus and serratus anterior muscles. The patient and clinical and electrophysiologic evidence consistent with complete severe right brachial plexopathy, at least postganglionic roots lesion, affecting from the fifth cervical to first thoracic nerve roots.

After electrodiagnosis was done, the patient was referred for further investigations which included chest x-ray and computer tomography of chest and neck. His chest x-ray showed multiple blebs which were seen in the right upper lung; computer tomography showed extensive nodular masses with highly malignant characteristics occupying the right paratracheal region exten-

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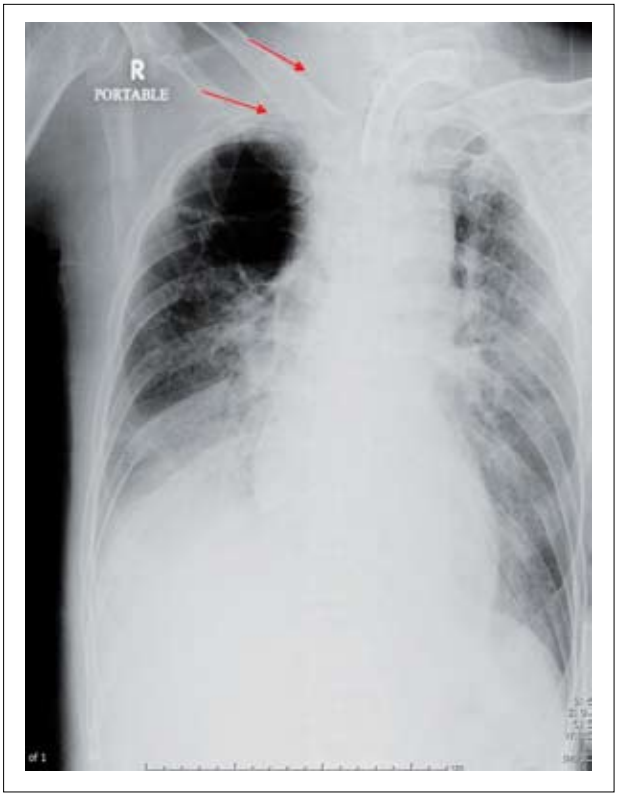

Fig 1. Chest x-ray finding. Soft tissue density mass at Right apical lung and lower neck with destruction of right 1st rib and lower cervical spines.

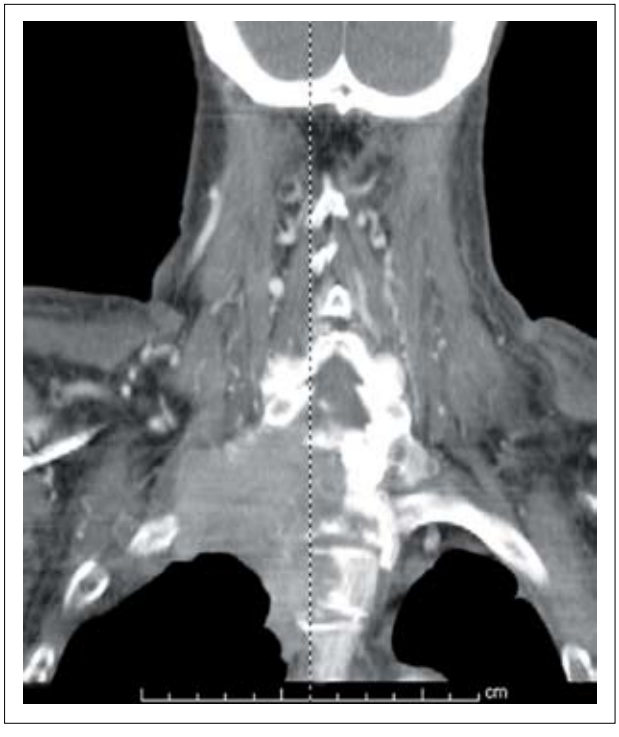

Fig 2. Post contrast enhance CT scan (coronal view, soft tissue window). Irregular enhancing mass at right apical lung with destruction of C7-T1 vertebral bodies.

ding from the fifth cervical to the third thoracic roots showing aggressiveness by invasion of the body's, spinal arch and spinal canal of the right side of the seventh cervical to the second thoracic roots. The final diagnosis was lung carcinoma with metastasis. He received palliative treatment because the tumor had metastasized to other organ systems. He died with respiratory failure and aspirated pneumonia about one month after diagnosis.

DISCUSSION

Pancoast tumor is also called superior sulcus tumor, and arises posteriorly in the apex of an upper lobe near the brachial plexus, commonly infiltrating the eighth cervical and first thoracic nerve roots. The classic presentation is a patient who complains of an aching pain about the shoulder region with some radiation to the scapula, muscle wasting, weakness of the intrinsic hand muscles unilaterally (C8-T1 distribution), paresthesias along the medial border of the arm, forearm and hand and Horner's syndrome. With further extension through the intervertebral foramina in 5 percent of the patients initially, but as many as 25 percent later in the course of the disease, so compression of the spinal cord and paraplegia may result.[1-4]

Less common manifestations of pancoast tumors include involvement of phrenic nerve and recurrent laryngeal nerve involvement.[4,5] Moreover, it is a rare case of pancoast tumor which totally involves the fifth cervical through the third thoracic nerve roots. Enlargement of the supraclavicular lymph nodes may also occur[4,6] and may be the cause of compression and it is uncommon in the initial stages of the disease, but may occur in later stages. Weakness typically follows as the tumor progressively destroys more neural tissue and as the lymph nodes are enlarged.

Treatment for presumed cervical osteoarthritis or bursitis of the shoulder is not uncommon, and in many series, a delay of 5 to 10 months in the correct diagnosis has been reported. This case presented with an aching

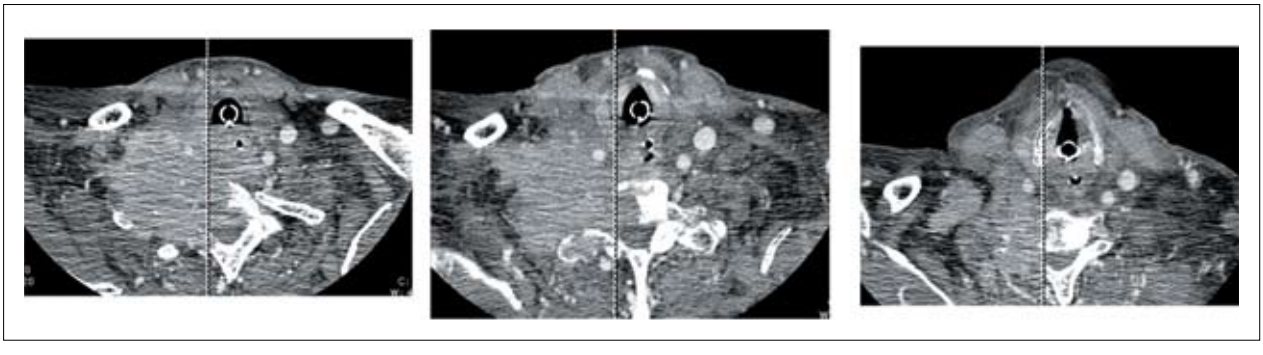

Fig 3. Post contrast enhance CT scan (axial view). Tumor extends upwardly to lower part of right-sided neck. Involvement of right-sided of C7-T2 vertebral bodies with tumor extension into spinal canal at these levels.

pain of the right shoulder region with some radiation to the arm, forearm and hand. He developed the numbness of the right hand later and was diagnosed and treated for cervical spondylosis with radiculopathy. In the authors' opinion, correct diagnosis initially may be difficult because the patient presents only pain and numbness without any weakness, similar to the signs and symptoms of early radiculopathy. However, the detailed history and physical examination should be done for careful diagnosis and frequent follow up is necessary for the patient that has not received a definite diagnosis.

Prognosis of patients with pancoast tumors is related to several clinical factors. Factors that are associated with a poor prognosis in most series include extension of the tumor into the base of the neck, involvement of the mediastinal lymph nodes, vertebral bodies or great vessels, the presence of Horner's syndrome and a longer duration of symptoms.[5,7,8] Clinical factors associated with improved survival include good performance status, a weight loss of less than 5 percent of total body weight, and achievement of local control and pain relief after treatment.[8,9,10] Prognosis for this case was poor because of the superior vena cava and total brachial plexus involvement as well as the presence of Horner's syndrome without any clinical factors associated with improved survival.

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