



Cervicobrachialgia and Pancoast Tumor: Value of Standard Anteroposterior Cervical Radiographs in Early Diagnosis

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abstract

Ten patients diagnosed with Pancoast tumor were studied retrospectively. The definitive diagnosis was made between 2 and 24 months after the onset of pain. Pain localization was hard to pinpoint; some patients reported pain in four different sites (neck, shoulder, arm, and scapula). Five patients had previously been diagnosed with degenerative, inflammatory, or infectious diseases of the cervical spine or shoulder. In the remaining five patients, the diagnosis was made during the first clinical visit. In three patients, an orthopedic surgeon made the diagnosis by viewing a standard anteroposterior (AP) cervical radiograph. The radiographic evidence arousing suspicion of a Pancoast tumor was the lack of pulmonary air at the top of the affected lung. Furthermore, a parallel study was conducted on 100 consecutive patients seeking treatment for neck pain. By examining the AP radiographs of their cervical spines, the third rib and the top of both lungs were observed in all cases. This study stresses the value of standard AP cervical radiographs in the diagnosis of Pancoast tumor.

A persistent pain in the shoulder and neck can be the first symptom of a serious disease (eg, Pancoast tumor, myocardial infarction, spontaneous pneumothorax, etc). A history of neck, shoulder, and arm pain in a well-defined dermatoma can be present in pulmonary apex disease due to compression or infiltration of the brachial plexus. Owing to the symptoms and the patient's age, different specialists usually are consulted and reports of pain are generally attributed to degenerative diseases

(eg, cervical arthritis or degenerative process of the shoulder); all of this causes a variable delay in reaching a definitive diagnosis and correct treatment.^{1,2}

Pulmonary apex tumors, classically known as Pancoast tumors, are frequently bronchial carcinomas that produce a characteristic clinical syndrome. Located at the pulmonary apex, these tumors spread into nearby regions, affecting structures such as the lower roots of the brachial plexus, intercostal nerves, sympathetic ganglions, the first and second ribs, and vertebrae.

Symptoms may vary depending on the extension of the tumor and how affected the neighboring structures are—pain in the shoulder when the parietal pleurae has been invaded; a dorsal and scapular pain when the chest wall and intercostal nerves have been invaded; arm pain, hand atrophy, and sensitivity loss when the lower brachial plexus has been invaded; and Horner's syndrome (eyelid ptosis, myosis, and anhidrosis) when the stellar ganglia are invaded.¹⁻⁵ Because symptoms are vague, they can be mistaken for a more frequent condition affecting the neck and shoulder, thereby delaying diagnosis.

Pancoast tumor is a treatable disease but the likelihood of survival depends on how quickly the proper diagnosis is established.^{2,4,6-11} Occasionally, it is a lesion that can be seen in standard chest and cervical spine radiographs but usually goes undetected because most physicians are unaware of this entity. Thus, rheumatolo-

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TABLE
Patient Demographics

Patient	Age (y)	Pain		Deficits		Horner Syndrome	Previous Diagnosis
		Duration (mo)	Location	Motor	Sensitivity		
1	69	6	Arm, shoulder hemithorax, paravertebral	No	No	No	Scapulothoracic syndrome
2	63	3	Scapula, arm, neck	No	No	Yes	Cervicoarthritis
3	68	24	Axilla, paravertebral hemithorax	No	Yes	No	Brucellosis
4	51	10	Scapula, shoulder, arm, hemithorax	No	No	No	Chronic pancreatitis
5	44	3	High thoracic spine, arm	Yes	No	No	Cervical disk herniation
6	73	3	Scapula	No	No	No	None
7	50	6	Shoulder, high thoracic spine	No	Yes	No	None
8	62	3	Shoulder, high thoracic spine	No	No	No	None
9	64	2	Shoulder, axilla	No	No	No	None
10	59	8	Neck, shoulder, scapula, arm	No	No	No	None

gists, orthopedists, internists, and others who come across bone and joint diseases may erroneously diagnose conditions affecting the cervical spine (eg, arthritis, disk herniation, etc) or the shoulder (eg, subacromial syndrome, frozen shoulder, etc) when facing a Pancoast tumor during their first consultation.

The aim of this article is to alert physicians of a possible Pancoast tumor when making a differential diagnosis of painful neck or shoulder conditions. Moreover, the importance of standard anteroposterior (AP) cervical radiographs in the early diagnosis of a Pancoast tumor is stressed. The value of a standard radiograph of the cervical spine has not been previously reported.

MATERIALS AND METHODS

The medical records of 16 patients diagnosed and treated between 1987 and 1997 for a Pancoast tumor were examined retrospectively. The following data were studied: symptom onset and duration, previous visit to other specialists, previous diagnosis, and physical findings (Table). The diagnosis was confirmed in all patients by computed tomography (CT)-guided fine needle biopsy. Only 10 of 16

patients were included in the study, as the remaining 6 patients did not have all of the required data for analysis.

All 10 patients were men with an average age of 59 years (range: 44-73 years). Time between the onset of pain and a definitive diagnosis ranged between 2 and 24 months (average: 13 months). All patients smoked >20 cigarettes a day (average: 25 cigarettes/day).

Radiographic findings at the pulmonary apex that could suggest a mass were analyzed in all cervical and chest radiographs. Cervical spine radiographs of 100 randomly selected patients reporting cervical pain with a final diagnosis of cervical arthritis were used as the control group. Different surgical treatments, chemotherapy, and radiotherapy were also considered.

RESULTS

Analgesic therapy partially relieved the pain in four patients and completely in three, but was not useful in the remaining three patients. Pain location was scattered with only one patient experiencing pain in four different places. The most frequent areas were the shoulder, neck, scapula, and arm.

Two patients had a sensitivity deficit (patients 1 and 7), and Horner's syndrome was observed in one patient (patient 4). Previous diagnoses included a scapular-intercostal syndrome (patient 1), cervical arthritis (patient 2), brucellosis and neuralgia of the intercostal nerve (patient 3), chronic pancreatitis (patient 4), and cervical disk herniation (patient 5). In the remaining five patients, the first diagnosis was the definitive one.

Three patients were first diagnosed by the senior orthopedic specialist, using standard AP radiographs of the cervical spine (patients 2, 5, and 7) (Figure). The radiographic evidence that raised the suspicion of Pancoast tumor was the pulmonary air being separated from the first rib. A higher than normal pulmonary air density was observed in the zone occupied by the tumor.

Eight patients were treated with chemotherapy, preoperative radiotherapy, surgery, and postoperative radiotherapy. Patient 5 only underwent surgery as the tumoral lesion was small and easily resected. In patient 9, surgery and radiotherapy were not performed because the tumor was widespread. This patient died 3 months after a diagnosis had been established.

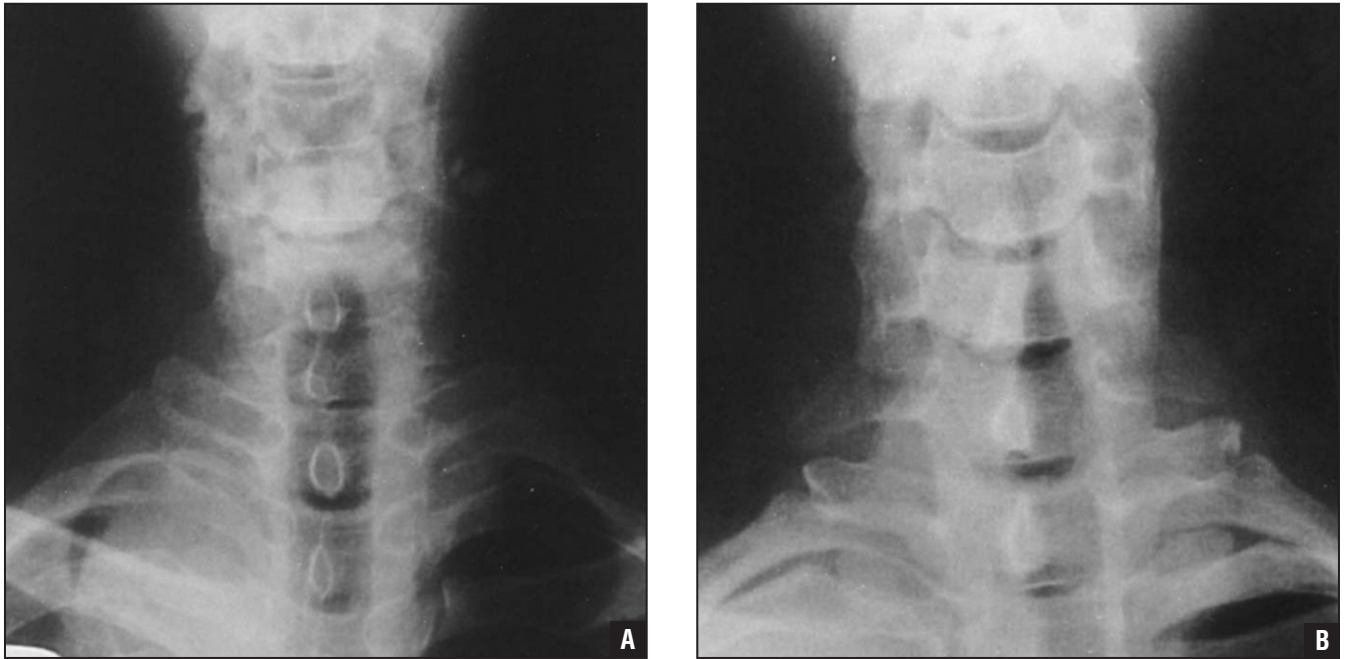


Figure: An irregular mass and opacity at the right pulmonary apex is noted in patients 2 (A) and 5 (B).

The pathological diagnosis was adenocarcinoma in eight patients and squamous cell carcinoma in the remaining two. Survival rate was 50% after 2 years and 30% after 5 years.

Anteroposterior radiographs in patients of the control group showed the pulmonary apex with the third and fourth ribs was visible.

DISCUSSION

In 1924, Pancoast described a syndrome associated with a pulmonary apex tumor that included constant pain distributed along the length of the eighth cervical dermatoma and the first and second thoracic nerves, combined with atrophy of the hand and Horner’s syndrome.^{1,4,12} This syndrome may be common to all tumors of the pulmonary apex. In our study, we agreed on the usual pain distribution although some of our patients displayed an atypical pain distribution: hemithoracic pain (two patients), paravertebral pain (two patients), and pain “in belt” (one patient).

In daily practice and with these symptoms, although the most likely consulted

specialists are rheumatologists, neurologists, and orthopedists, they are not usually well prepared to treat patients with lung cancer and do not currently consider Pancoast tumor as a possible differential

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diagnosis when facing a patient reporting pain in the cervical spine and shoulder. In our series, only one patient had Horner’s syndrome and none had a motor deficit due to radicular compression.

Chest radiographs lead to an accurate diagnosis of Pancoast tumor when this

possibility is kept in mind. In some cases and due to the overlapping of bony structures in the apical region and the high frequency of pleural thickenings, CT or magnetic resonance imaging is required to complete the study.^{1,3,4,12} In our study, all patients had chest radiographs available; radiographs showed a clearly visible lesion in six (60%) patients. Nevertheless, in three patients, the diagnosis was made by looking at a standard AP cervical radiograph, which showed the occupation of the pulmonary apex.

The diagnosis of a Pancoast tumor by examining a standard cervical radiograph has not been reported previously; however, we believe Pancoast tumor with neck pain can be diagnosed at an earlier stage if this sign is taken into consideration. Patients with Pancoast tumor can have an acceptable survival rate if prompt and proper treatment is achieved. It is of the utmost importance to anticipate a definitive diagnosis.

Although one may think the pulmonary apex cannot be seen in a standard cervical radiograph (simply because he or she does not typically look at the lungs

What is already known on this topic

- Pancoast tumors are located at the pulmonary apex. These tumors spread into nearby regions and affect structures such as the lower roots of the brachial plexus, the intercostal nerves, the sympathetic ganglions, the first and second ribs, and the cervicothoracic spine.
- Pancoast tumors usually present with constant pain distributed along the eighth cervical and the first and second thoracic dermatome. Atrophy of the hand and Horner's syndrome are common manifestations of Pancoast syndrome.

What this article adds


- In a patient with cervicobrachialgia, Pancoast tumors can be diagnosed at an early stage using a standard AP cervical radiograph.
- In a standard AP cervical radiograph, the radiographic finding arousing suspicion of a Pancoast tumor is the lack of air at the pulmonary apex of the affected lung.
- Chest radiographs, computed tomography, and MRI are required to confirm the diagnosis.

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when examining a cervical radiograph), the control group showed this possibility. Therefore, we believe this is sufficient evidence that Pancoast tumor can be seen if it is taken into consideration.

Treatment by means of radiotherapy and surgery offers the best survival rate after 5 years,^{6,7,9-12} ranging from 20%-38%. The survival rate at our institution after chemotherapy, radiotherapy, and surgery

with intraoperative radiotherapy (50% after 2 years and 30% after 5 years) is high. 

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