Josef, a 59-year-old male and heavy smoker for over 30 years, has developed almost constant right shoulder pain, recurrent headaches with dizziness and right cheek parasthesia.

**Medical history**

- He was adopted; family history unknown
- Underwent right inguinal hernia repair
- No allergies
- Over the last 30 years, has smoked 20 to 25 cigarettes per day
- On weekends, regularly drinks three to five beers per day
- Over last five years, diagnosed with dyslipidemia; treated with rosuvastatin calcium 10 mg q.d.

**Physical examination**

- Weight 192 pounds; height six feet
- BP 134/84 mmHg; regular heart rate 88 bpm
- Right shoulder has full range of motion, but feels painful with some movements
- Chest examination found some prolongation of expiration
- Right cheek has decreased sensation

**Clinical Investigation**

- Hemoglobin: 165 g/L
- Glucose fasting: 6.4 mmol/L
- GGT: 87 U/L
- Cholesterol fasting: 6.4; HDL: 2.2; LDL: 3.8; Triglycerides: 0.78 mmol/L
- Chest x-ray: Apex antero-posterior view (Fig. 1), Antero-posterior view (Fig. 2)
- CT scan of chest (Fig. 3)
- CT scan of brain was normal
- Fine needle aspiration

**What is your diagnosis?**

a. Mesothelioma  
b. Tuberculosis  
c. Metastatic malignancies (thyroid, larynx)  
d. Pancoast tumour

Joseph’s chest x-rays (Figs 1, 2) show the hyperinflated lungs, a fair amount of pleural thickening and a soft-tissue density in the right apex medially. The remainder of the lungs are clear, the heart and hila are unremarkable, and definite rib or vertebral body destruction are not seen. The CT scan of the thorax (Fig 3) shows a 2.4 by 1.8 cm right upper lobe pleural-based soft tissue mass, and a primary lung neoplasm is to be excluded. No associated bone destruction is identified. Fine needle aspiration was non-diagnostic, and shows necrotic tissue and atypical cells.

Postoperative diagnoses of right upper lobectomy were: right upper lobe lung tumour with possible parietal pleural invasion or attachment; no involvement of the superior sulcus, ribs or vertebrae.
About Pancoast tumour

A true Pancoast tumour usually extends through the visceral pleura into the parietal pleura and chest wall. Its histopathology is epithelial in nature, but its exact origin remains uncertain. The tumour is located at the extreme apex of either the right or left lung, in what is called the pleuropulmonary groove (superior sulcus), near the subclavian vessels. It frequently invades the second and third ribs, intercostal nerves, brachial plexus, stellate ganglion superiorly, and vertebral bodies posteriorly.

The most common initial symptom is shoulder pain. This is usually due to tumour extension into any of the following adjacent structures: brachial plexus, parietal pleura, endothoracic fascia, vertebral bodies, and the first three ribs. Weakness, atrophy and paresthesias of the hand, arm and forearm are resultant symptoms. In as many as 25% of patients, compression of the spinal cord and paraplegia develop when the tumour extends into the intervertebral foramina. Horner syndrome, which is described as ptosis, miosis and anhidrosis, is reported to occur in 14 to 50% of patients. This is caused by invasion of the paravertebral sympathetic chain and stellate ganglion. Less common manifestations include phrenic nerve involvement (patients typically report dyspnea and orthopnea; respiratory function tests tend to have a restrictive pattern) and recurrent laryngeal nerve involvement (difficulty speaking and swallowing, and hoarseness). Superior vena cava (SVC) syndrome, which is compression of the SVC with resulting dyspnea and facial and upper extremity edema, though uncommon, also occurs. Pancoast tumour has a rapid and almost universal mortality rate. Risk factors include smoking and exposure to various contaminants (asbestos, radon gas, uranium, arsenic fumes, isopropyl oil, nickel, metallic iron, iron oxide, and beryllium). The differences among race are correlated with smoking prevalence.

Radiology shows an apical mass (up to 75%) or a unilateral apical pleural thickening > 5mm (up to 50%). MRI is most accurate for detecting chest wall invasion, and brain imaging for staging is highly recommended. Histologic diagnosis requires a percutaneous transthoracic needle biopsy, with fluoroscopic, ultrasonographic or CT localization. More than 95% of Pancoast tumours are non-small cell carcinoma, most commonly squamous cell carcinomas (52%), or adenocarcinomas and large cell carcinomas (each subtype approximately 23%). Small cell carcinomas are seen in fewer than five per cent of cases.

Treatment

The preferred treatment of Pancoast tumour is a combination of radiation followed by surgical resection of the tumour.