Thickened Posterior Tracheal Stripe in a 50-Year-Old Man*

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This 50-year-old man presented to the Denver Veterans Administration Hospital with a four-week history of productive cough, hemoptysis, weight loss, and intermittent fever. He was a non-smoker and denied symptoms of dysphagia or dyspepsia. Physical examination revealed only a firm node, 1 cm in diameter, in the right supraclavicular fossa. Laboratory studies showed a hematocrit of 33 percent and hematest-positive stool. Posteroanterior and lateral chest roentgenograms were obtained (Fig 1 and 2).
Diagnosis: Carcinoma of the esophagus

The PA chest roentgenogram shows left hilar enlargement and increased density. The parenchyma is normal. On the lateral film, there is prominence of the esophageal air column and the posterior tracheal stripe is thickened, measuring 5.5 mm in width (Fig 3). The barium swallow film (Fig 4) demonstrates extensive involvement of the distal two-thirds of the esophagus. Biopsy proved squamous cell carcinoma.

The posterior tracheal stripe is visible in over 90 percent of normal chest radiographs. It is formed by two interfaces. The anterior interface is formed by the inner surface of the posterior tracheal wall, and outlined by air in the lumen. The posterior interface is normally formed by the outer surface of the right posterior tracheal wall outlined by aerated lung in the right retrotracheal recess. The normal posterior tracheal stripe appears as a band not greater than 3 mm in width. A posterior tracheal stripe measuring 4 mm or more is considered to be abnormal. Pathologic processes in the superior mediastinum may either obliterate or accentuate the posterior tracheal stripe. Pulmonary lesions that opacify the medial aspect of the right upper lobe (e.g., atelectasis or pneumonia) will tend to silhouette out the posterior tracheal stripe, while a process that infiltrates the mediastinum between the trachea and esophagus (e.g., carcinoma of the esophagus) will widen the stripe. In this situation, the posterior interface is often caused by esophageal air outlining the anterior esophageal wall.

In Putman’s analysis of 51 autopsy-proved cases of carcinoma of the esophagus, 31 had both PA and lateral chest roentgenograms available. In 20 cases, the posterior tracheal stripe was greater than 4.5 mm, in 18 of which the carcinoma involved the middle third of the esophagus, while in 2 it involved the upper third. Other conditions that thicken the posterior tracheal stripe include achalasia, old granulomatous disease, and severe tracheobronchitis. In certain degrees of obliquity, a false widening of the posterior tracheal stripe is said to occur.

The thickened stripe in carcinoma of the esophagus is caused either by the tumor or by lymph node metastases. The lymphatic drainage from the middle third of the esophagus is to the nodes located between the trachea and the esophagus. Autopsy specimens of patients with carcinoma of the esophagus and roentgenographic widening of the posterior tracheal stripe have revealed paraesophageal and paratracheal node enlargement, either from lymphatic obstruction or from tumor invasion.

The presence of a posterior tracheal stripe that measures greater than 4.0 mm on the lateral chest film should suggest a diagnosis of carcinoma of the esophagus and a barium swallow film should be obtained.

References