

Metastatic Involvement of the Stomach Secondary to Lung Carcinoma

Hyun Soo Kim, M.D., Woo Ick Jang, M.D., Hee Seung Hong, M.D.,
Chong In Lee, M.D., Dong Ki Lee, M.D., Suk Joong Yong, M.D.,
Kye Chul Shin, M.D., Young Hak Shim, M.D.

*Department of Internal Medicine, Yonsei University Wonju College of Medicine,
Wonju, Korea*

Blood-borne metastatic involvement of the stomach by cancer is a rare entity. According to the number of reports in the literature, the most common tumors that spread to the stomach through the blood stream are malignant melanoma, breast carcinoma and lung carcinoma. Recently, two cases of metastatic involvement of the stomach secondary to lung carcinoma were diagnosed by gastroscopy. The first patient was a 66-year-old man who had primary lung carcinoma with multiple bone and subcutaneous metastases. Gastroscopy showed multiple submucosal tumors with central umbilications in the fundus and in the upper body of the stomach. Pathologic examination revealed massive submucosal infiltration and conical shaped and scanty deep mucosal infiltration of undifferentiated small cell carcinoma suggestive of metastatic involvement. The second patient was a 68-year-old man who had primary lung carcinoma with brain metastasis. Gastroscopy showed a large fungating mass in the greater curvature side of the stomach. Pathologic examination revealed poorly differentiated squamous cell carcinoma. We report the two cases of metastatic gastric cancer from lung carcinoma with the literature review.

Key Words: *Metastatic gastric cancer, Primary lung carcinoma*

INTRODUCTION

Blood-borne metastatic involvement of the stomach by cancer is a rare entity. Davis and Zollinger (1960) reported 67 metastatic tumors in the stomach among 23,019 autopsied cases and Higgins (1962) found 64 cases of metastatic carcinoma in the stomach among 31,541 autopsied cases. The incidence in both series was 0.2%. According to the number of reports in the literature (Davis and Zollinger, 1960; Higgins, 1962; Joffe, 1975; Menuck and Amberg, 1975), the most common tumors that spread to the stomach through

the blood stream are malignant melanoma, breast carcinoma and lung carcinoma. The discovery of stomach metastasis before autopsy seems to be extremely rare. A rare cases of metastatic involvement of the stomach secondary to breast carcinoma and malignant melanoma are reported in Korean literature (Hyun et al., 1982; Kim et al., 1991; Lee et al., 1983). We report the two cases of metastatic involvement of the stomach secondary to lung carcinoma with the literature review.

CASE REPORT

Case 1:

A 66-year-old man was admitted to Wonju Christian Hospital because of epigastric pain and general weakness. The vital signs were stable. Physical examination revealed epigastric tenderness, rales in both lower lung fields and a single subcutaneous nodule

Address for correspondence: *Woo Ick Jang, Department of Internal Medicine, Yonsei University Wonju College of Medicine, 162 Ilsan-Dong, Wonju, 220-701, Korea (Tel. 0371-41-6320, Fax 0371-731-5884)*

in the left lateral chest wall. The hemoglobin was 14.8g%, the white-cell count 12,000/mm³ with 75 percent neutrophils. The serum alkaline phosphatase was 286 U/L. Stool guaiac test was negative. Upper gastrointestinal radiography revealed multiple masses with

central umbilications (Fig. 1a). Gastroscopy showed multiple submucosal lesions with central umbilications in the upper body and the fundus of the stomach (Fig. 1b). A whole body bone scan showed multiple hot uptakes in the pelvic bone and the skull. Pathologic ex-

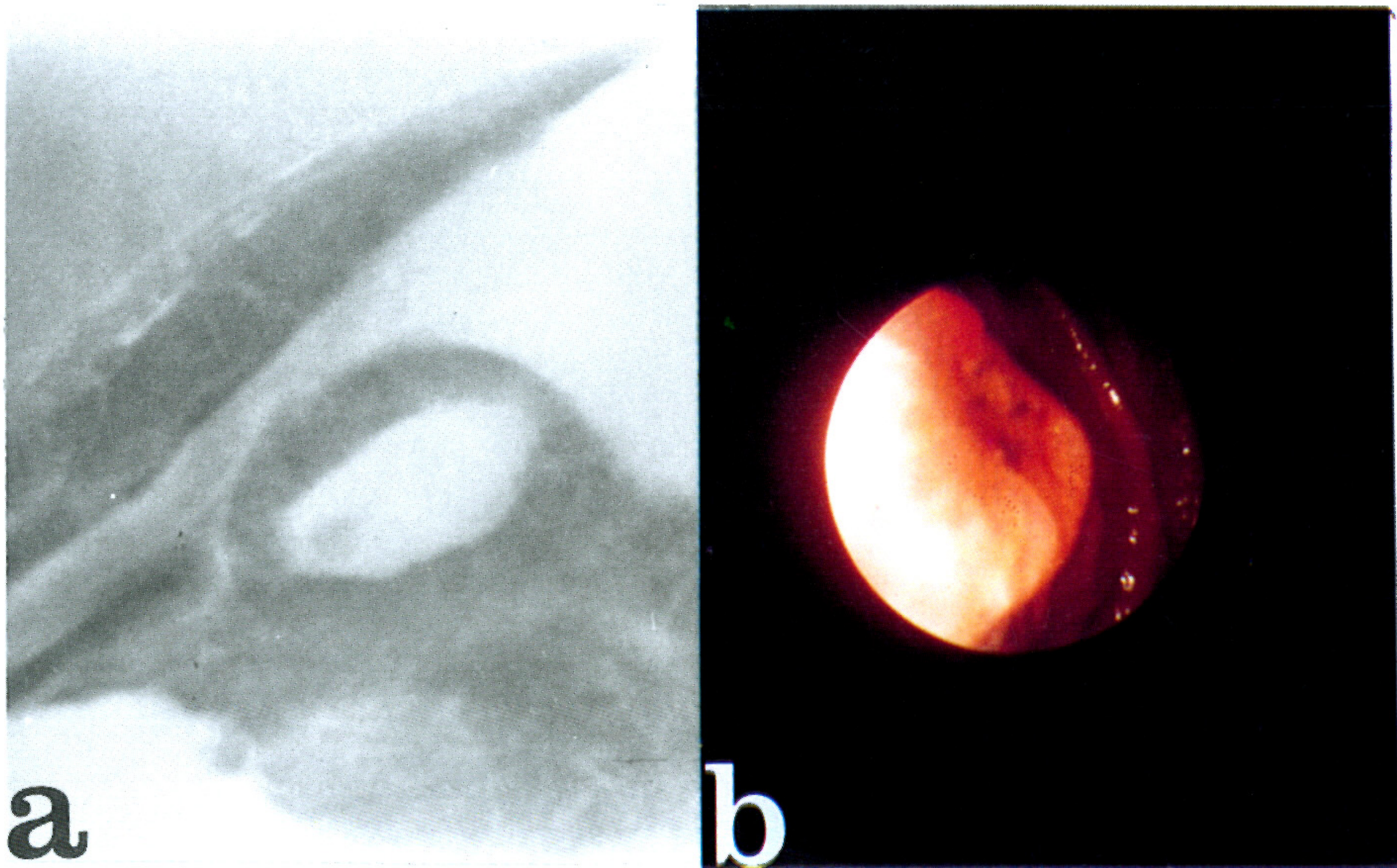


Fig. 1. The upper gastrointestinal radiography reveals a mass with central collection of barium resembling the "target" or "bull's eye" lesion (1a). Fiberopticgastroscopy shows a submucosal lesion with central umbilication in the proximal stomach (1b).

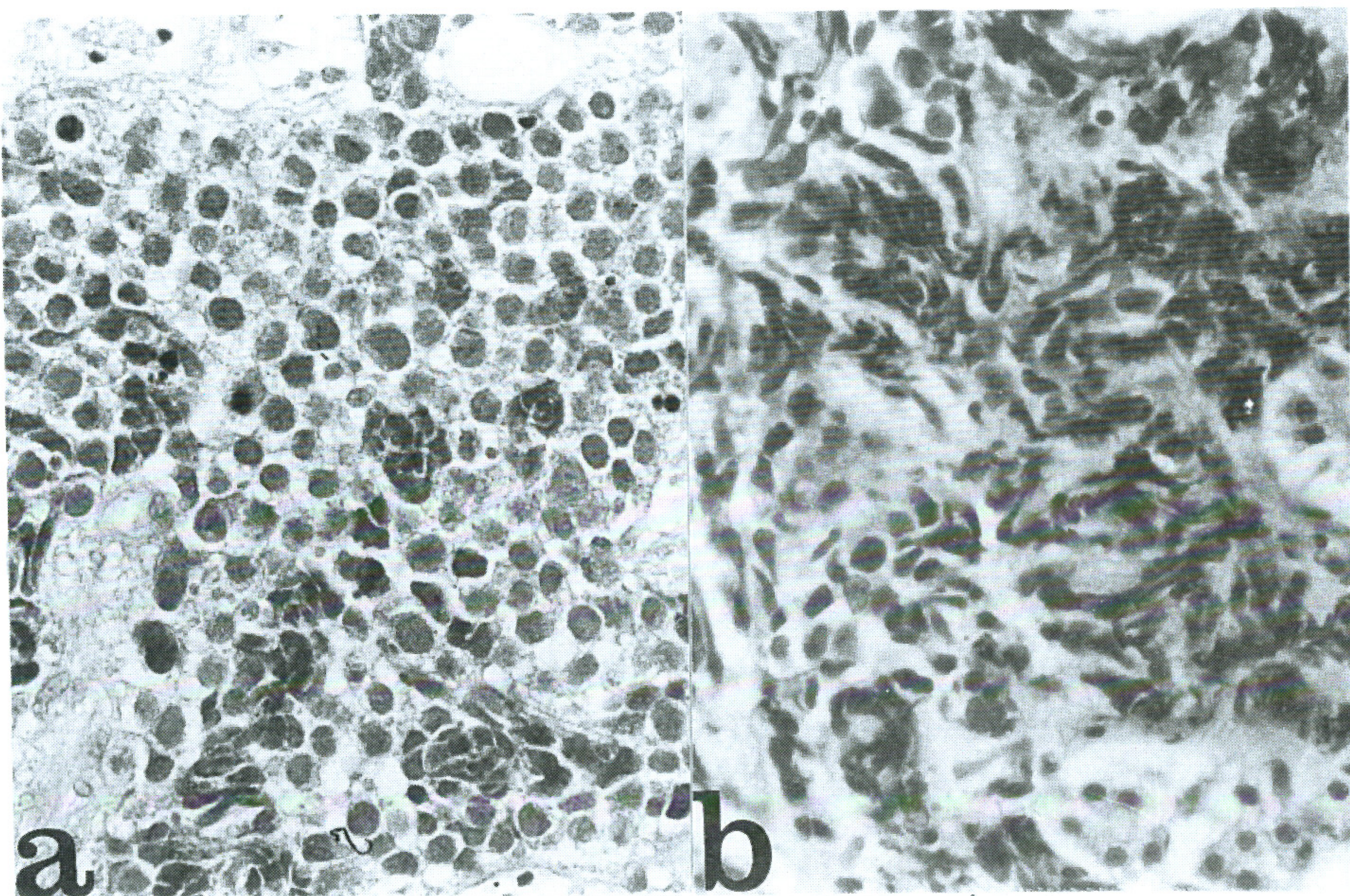


Fig. 2. Microscopic findings of the subcutaneous nodule (2a) and the stomach (2b) reveal metastatic undifferentiated small cell carcinoma (H & E $\times 400$).

amination of the subcutaneous nodule yielded metastatic undifferentiated small cell carcinoma (Fig. 2a). Pathologic examination of the stomach showed massive submucosal infiltration and conical shaped and scanty deep mucosal infiltration of the undifferentiated small cell carcinoma suggestive of metastatic involvement (Fig. 2b).

A X-ray film of the chest revealed the ill-defined left perihilar haziness with peripheral infiltration (Fig. 3a). The chest C-T scan showed an about 3cm sized elliptical left hilar mass involving the left main bronchus and the upper lobe bronchus with collapsed left upper lobe (Fig. 3b). Bronchoscopy could not be performed because of poor performance status.

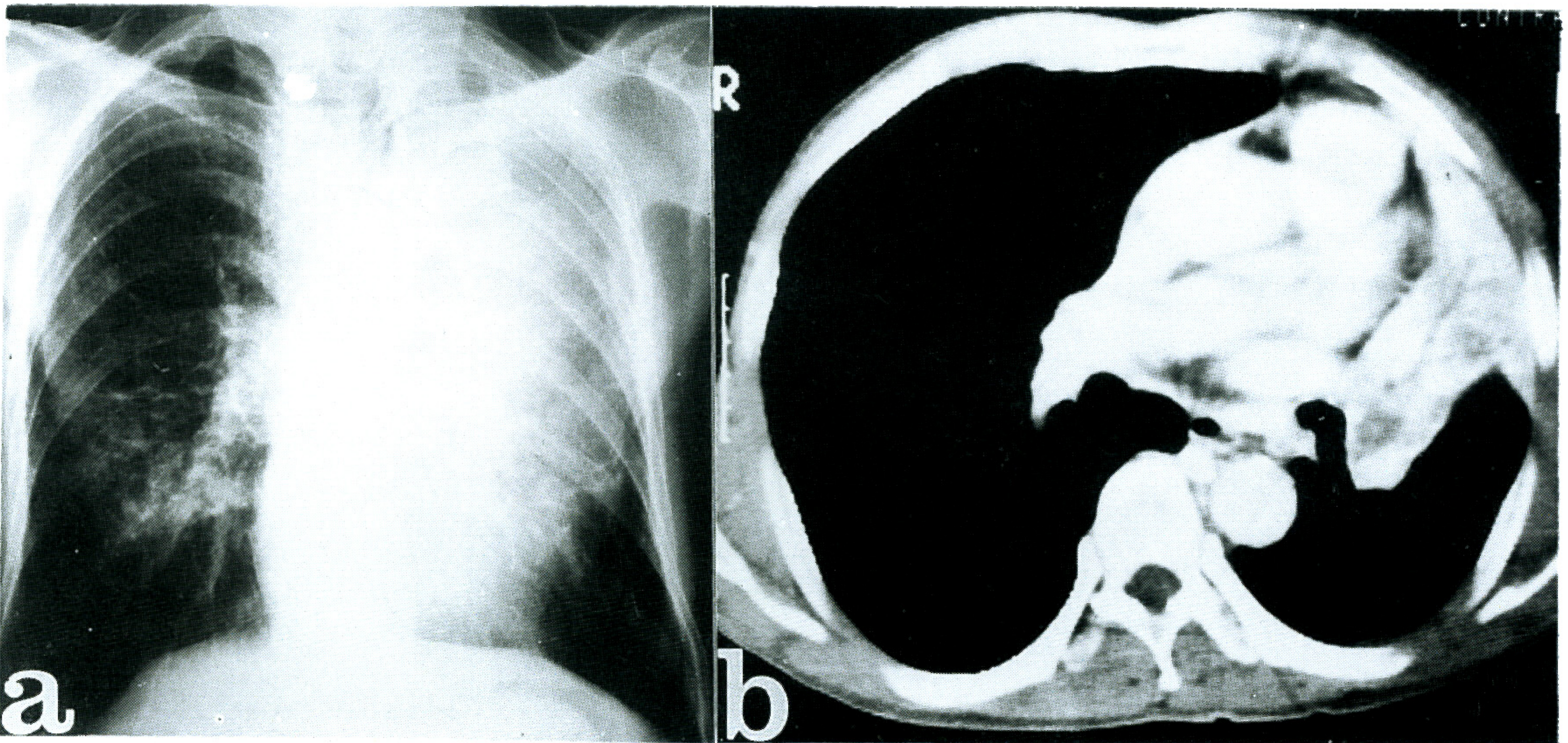


Fig. 3. An X-ray film of the chest shows the ill-defined left perihilar haziness with peripheral infiltration (3a). The chest CT scan shows an about 4cm sized elliptical left hilar mass involving the left main bronchus and the upper lobe bronchi with the left anterior mediastinal metastatic lymph nodes and collapsed, consolidated left upper lobe (3b).

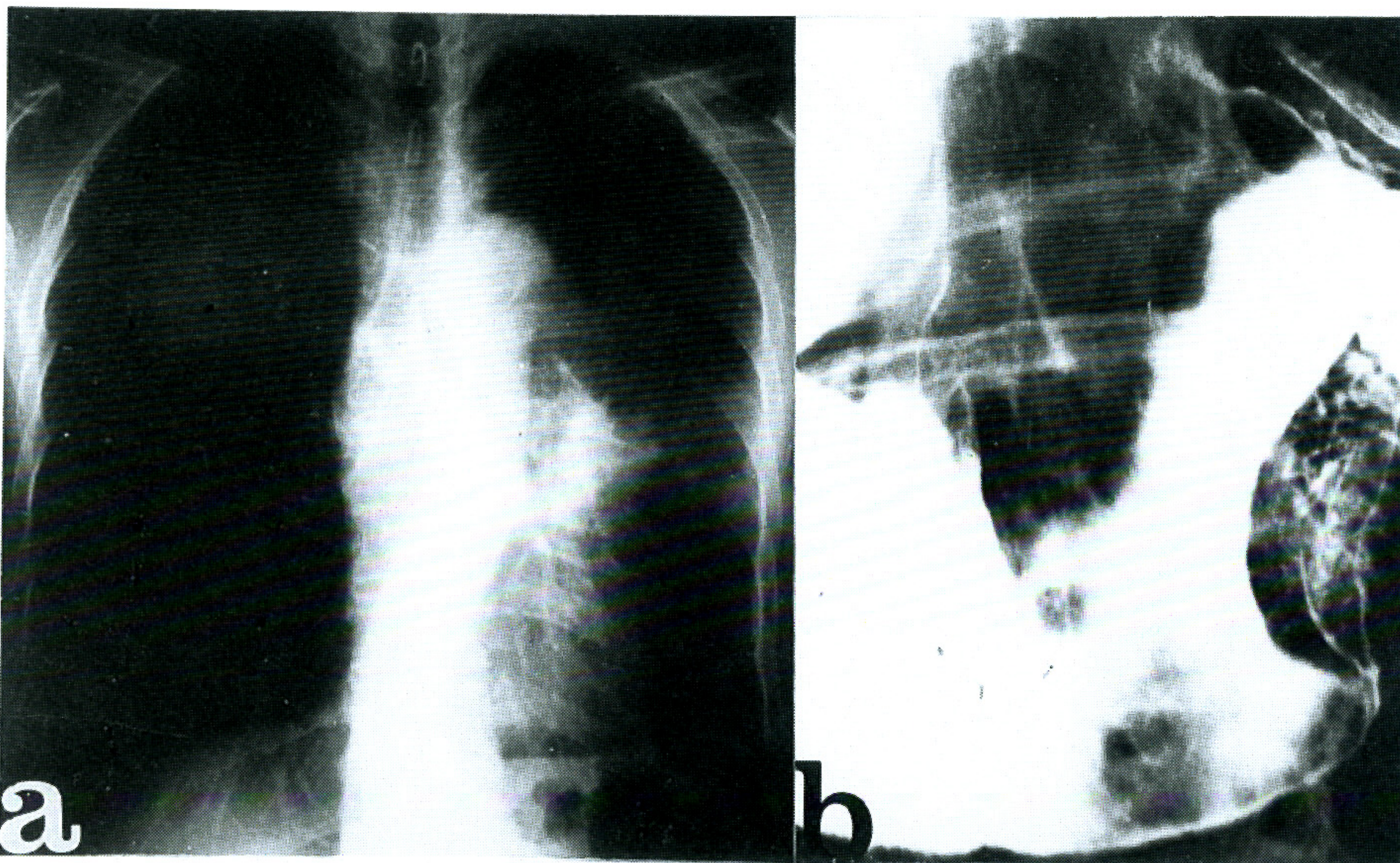


Fig. 4. An X-ray film of the chest shows a ill-defined mass in the left upper lung field (4a). The upper gastrointestinal radiography reveals a large polypoid filling defect on the greater curvature side of the midbody (4b).

Ultrasonography-guided percutaneous fine needle aspiration lung cytology examination gave negative results due to inadequate specimen.

Case 2:

A 68-year-old man was admitted to Wonju Christian Hospital because of polydipsia and headache for 20 days. The patient had been well until 10 months earlier, when a productive cough developed. Hemoptysis and weight loss were also noted. He had a history of smoking 1 pack of cigarettes per day for 30 years. There were no upper gastrointestinal symptoms.

The hemoglobin was 12.4 g%, the white-cell count 7,300/mm³ with 66 percent neutrophils. The stool guaiac test was positive. An X-ray film of the chest revealed the ill-defined left perihilar haziness obliterating the left cardiac border and the aortic knob with peripheral infiltration (4a). The upper gastrointestinal radiography revealed a large polypoid filling defect on the greater curvature side of the midbody (Fig. 4b).

Bronchoscopy revealed an erythematous main nodular mass obliterating the left upper lobe bronchial

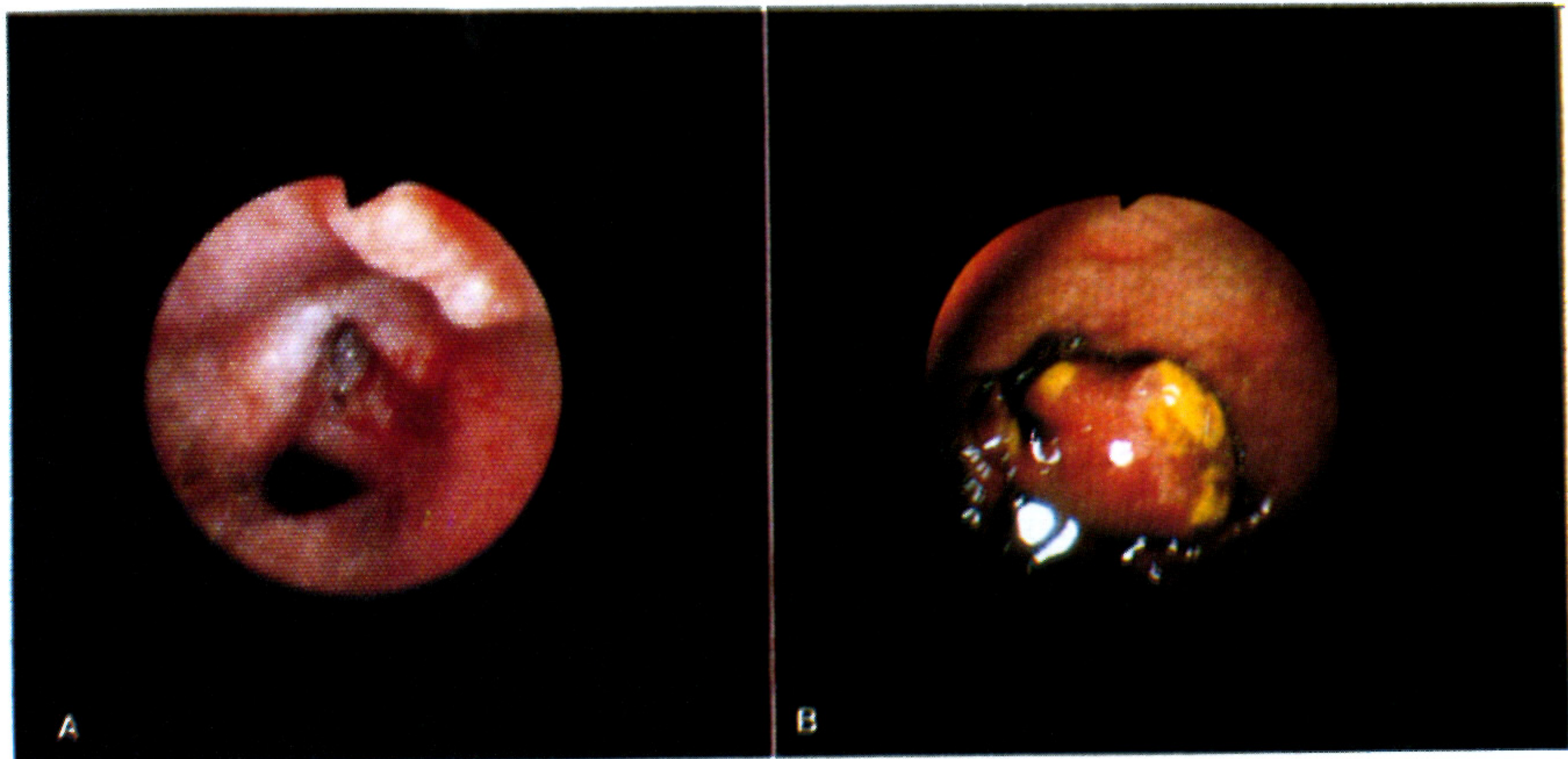


Fig. 5. Bronchoscopy Shows an erythematous main nodular mass obliterating the left upper lobe bronchial lumen (5a). Fiberoptic gastroscopy shows a 3cm in diameter fungating mass on the greater curvature side of the midbody (5b).

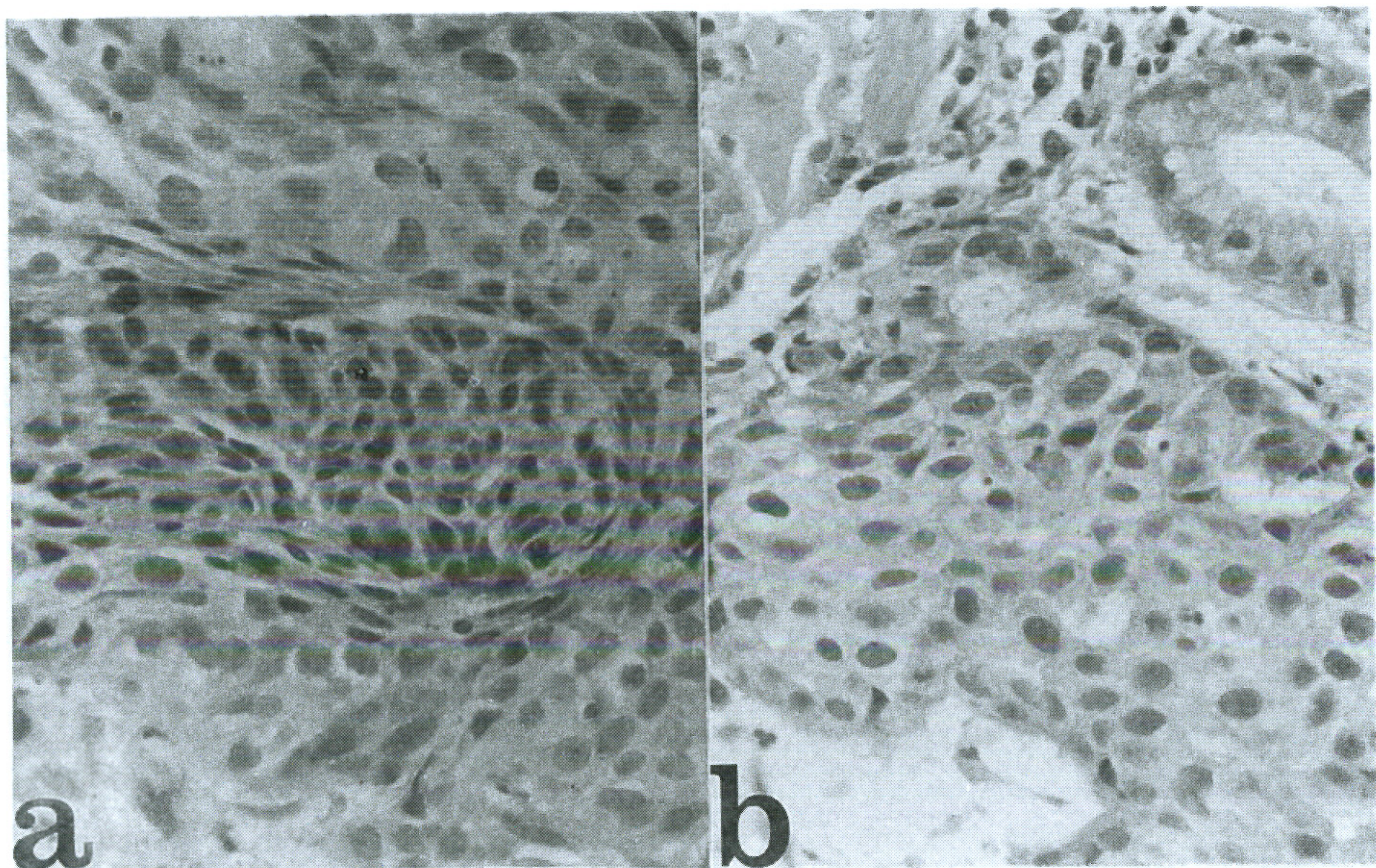


Fig. 6. Microscopic findings of the lung (6a) and the stomach (6b) reveal poorly differentiated squamous cell carcinoma (H & E ×400).

lumen and a daughter nodule on the anterior wall of distal main bronchus (Fig. 5a). Gastroscopy showed a 3cm sized fungating mass on the greater curvature side of the midbody (Fig. 5b). Pathologic examination of the bronchus revealed poorly differentiated squamous cell carcinoma (Fig. 6a), but transitional area between the normal epithelium and the carcinoma cannot be found because of insufficient specimen. Pathologic examination of the mucosa of the stomach (submucosa was not obtained from endoscopic biopsy) showed same as the pathologic findings of the lung. The brain CT scan showed a relatively homogenous enlarged infundibulum, bulging of the right cavernous sinus and erosion and/or destruction of lamina dura highly suggestive of metastatic pituitary tumor. And the patient showed clinical features of diabetes insipidus.

Daily urine output was more than 4,000 ml/day. Serum and urine osmolality were 282 mmol/kg and 168 mmol/kg respectively. Water deprivation test showed that the ratio of urine and serum osmolality was 0.75 after water deprivation, and the ratio was 1.15 after injection of 5U of pitressin. Serum prolactin was 152 ng/ml. ACTH and cortisol were 11.3 pg/ml and 2.87 ug/ml respectively.

DISCUSSION

The occurrence of metastases to the stomach is rare. Most studies from autopsy cases report an incidence of from 0.2% to 1.7% (Davis and Zollinger, 1960; Green, 1989; Higgins, 1962). But reports of its higher occurrence are documented in autopsy studies of breast carcinoma (6.0% to 15.2%: Asch et al., 1968; Choi et al., 1963; Hartmann and Sherlock, 1961), melanoma (3.2% to 26%: Gupta and Brasfield, 1964; Reintgen et al., 1984) and lung carcinoma (0.5% to 9.0%: Antler et al., 1982; Green, 1990). The primary neoplasms which most frequently metastasize to the stomach are lung carcinoma, breast carcinoma and malignant melanoma. Rare cases of gastric metastases reported in the literature include hepatocellular carcinoma, choriocarcinoma, seminoma, squamous cell carcinoma of the esophagus and mucoepidermoid parotid tumors (Fleck et al., 1984; Fowle et al., 1987; Glick et al., 1985; Saito et al., 1985; Shibata et al., 1980; Kibsgaard K, 1979). Edward and Royle (1975) and Antler et al. (1982) reported that large cell carcinoma of the lung have the highest prediction for gastrointestinal tract metastases.

Although patients with gastric metastases are often asymptomatic, epigastric pain, nausea, vomiting, dys-

phagia, postprandial bloating, obstruction, perforation and bleeding may be noted. Bleeding may be massive or gradual, producing iron deficiency anemia. Rapid blood loss or perforation of the stomach can be the cause of death (Edwards and Royle, 1975; Higgins, 1962; Saliba et al., 1966). Metastatic gastric lesion may be the first presentation of the diseases (Davis and Zollinger, 1960; Green 1989).

Roentgenographic and gastroscopic findings are correlated with pathological findings. Generally pathological appearance of metastatic involvement of the stomach can be categorized in 4 types (Choi et al., 1963; Joffe, 1975): (1) microscopic infiltration; (2) gross nodule; (3) gross ulceration; (4) gross hypertropied wall. In hematogenous metastasis to the stomach, the tumor cells initially implant in the submucosa and as the lesion enlarges there may be erosion of overlying gastric mucosa with diminishing blood supply to its central portion.

The roentgenographic appearance can be categorized in 4 types (Choi et al., 1963; Green, 1989; Rubin and Davis, 1985): (1) no abnormality; (2) filling defect without central collection of barium; (3) filling defect with central collection of barium resembling the "target" or "bull's eye" lesion; (4) rigidity and thickening of the gastric wall resembling linitis plastica.

Gastroscopy has been shown to be an important diagnostic tool in evaluating metastatic gastric lesions, especially in those cases in which findings of radiographic studies are normal. There are three main morphologic types of lesions (Nelson and Lanza, 1978; Sandler et al., 1981): (1) Multiple nodules of varying size with tip ulceration arising on the crests of normal rugae; (2) submucosal tumor masses elevated ulcerated at the apex giving rise to the "volcano-like" lesions; (3) nonulcerated masses.

In summary, we report two cases with metastatic involvement of the stomach secondary to lung carcinoma. Symptoms associated with metastatic lesion were the first presentation of the disease in our cases. The first case showed typical metastatic gastric cancer confirmed by typical pathologic findings and by endoscopic findings. But the second case showed atypical endoscopic and radiologic findings similar to the polypoid type of primary gastric carcinoma.

The clinician must be aware of the possibility of metastasis and, if there is the existence of upper gastrointestinal symptoms and signs and/or the evidence of gastrointestinal bleeding, endoscopic examination and/or radiographic study must be performed. Early detection of metastatic gastric lesions can diminish the treatment related complications and thus therapeutic modalities can be changed.

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