Lung Cancer Implantation in the Chest Wall Following Percutaneous Fine Needle Aspiration Biopsy

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We describe a 70-year-old man with lung cancer implantation in the chest wall following percutaneous fine needle aspiration biopsy. He underwent lobectomy after percutaneous transthoracic fine needle aspiration biopsy using a 19-gauge needle. Twenty-six months after the biopsy, he noticed a hard subcutaneous tumor at the biopsy site in the chest wall. Ribs and intercostal muscles were resected. The primary lung tumor and the chest wall tumor were histologically identical, but were not contiguous to each other. We concluded that the subcutaneous tumor was due to needle biopsy implantation. This complication is extremely rare, but open biopsy should always be considered as a possible alternative. During the procedure, care must be taken with the least chance of implantation and patients should be observed carefully after needle biopsy.

Key words: neoplasm seeding – needle biopsy – lung neoplasms

INTRODUCTION

Fine needle aspiration biopsy (FNAB) in patients with a pulmonary nodule is a reliable and simple diagnostic procedure (1,2). Malignant cell implantation is a potential, but extremely uncommon complication (1,3,4). We describe a case of lung cancer with cancer implantation in the FNAB needle tract.

CASE REPORT

A 70-year-old man underwent left lower lobectomy and lymph node dissection for lung cancer in January 1997. Preoperative transbronchial lung biopsy had failed to show evidence of malignancy, but percutaneous transthoracic FNAB of the lung lesion through the left posterior chest wall using a 19-gauge needle in November 1996 yielded a diagnosis of moderately differentiated adenocarcinoma. The postoperative pathological diagnosis was moderately differentiated adenocarcinoma (Fig. 1), T3N0M0, stage IIB (5). The cancer had invaded the elastic layer of the parietal pleura, which was resected together with the lower lobe, but had not invaded either the ribs or intercostal muscles.

In January 1999, 26 months after the FNAB, he noticed a hard subcutaneous tumor in the left posterior chest wall. The tumor was located at the FNAB site and distant from the thoracotomy incision. It was 3 cm in diameter, fixed to the eighth and ninth ribs, firm and painless. CT scan of the chest indicated that the mass was in the subcutaneous layer and in the previous FNAB needle tract (Fig. 2a and b). FNAB of the tumor had demonstrated adenocarcinoma. There was no evidence of distant metastasis. We speculated that the mass was lung cancer implantation resulting from the previous FNAB.

The tumor, overlying skin, eighth and ninth ribs and intercostal muscles were surgically resected 29 months after the first surgical intervention. The chest wall defect was restored with a sheet of Marlex mesh (Davol, Cranston, RI, USA). The postoperative course was uneventful and he was discharged 9 days after the operation. The patient is doing well with no signs of recurrence 6 months after resection. Pathologically, the tumor was diagnosed as moderately differentiated adenocarcinoma without periosteal invasion (Figs 3 and 4). As the primary lung tumor and the chest wall tumor were histologically identical but not contiguous and the chest wall tumor was located precisely at the FNAB site, we concluded that the chest wall tumor was FNAB implantation.
DISCUSSION

FNAB is a well-established technique for definitive diagnosis of tumor because of its high diagnostic yield, simplicity and low morbidity (1,2). FNAB in the lung may be complicated by pneumothorax, hemorrhage, infection and air emboli. Tumor cell implantation along the needle tract is an extremely rare but potential complication of this technique (1,3,4).

These complications are more likely to follow the use of cutting needles or large-bore needles (4), because such needles yield larger stromal fragments, resulting in a more severe visceral injury. Tumor spread along the needle tract following FNAB has rarely been reported (1,6,7). Sinner reported only one case of FNAB-related tumor seeding in a total of 1264 patients (0.08%) (1). Lalli et al. reported more than 1500 procedures without a single incidence of needle tract implantation (3). Harrison et al. reported that two patients (3%) suffered from needle tract implantation after FNAB, although they had only 66 patients in their series (8). Our case is the only one in our institution in approximately 900 needle biopsy cases during the 7-year period from January 1993 to January 2000.

Totally effective prevention and management of tumor cell implantation following FNAB remains undetermined. Wolinsky and Lischner (9) performed immediate radiotherapy after needle biopsy to prevent tumor implantation, but nevertheless one patient in their series developed tumor implantation in the chest wall. Seyfer et al. (7) reported a case of chest wall implantation of pulmonary adenocarcinoma after FNAB, successfully managed by aggressive chest wall resection and immediate reconstruction with a rectus abdominis musculocutaneous flap. In our case, we performed tumor resection including the skin, ribs and intercostal muscles, as no other lesions were detected, with no recurrence so far.

Because of its rare incidence (1), this complication should
not affect the use of FNAB in lung cancer patients. Wolinsky and Lischner concluded that FNAB should not be performed to lesions likely to be malignant and operable (9). Even if FNAB does not reveal malignancy, this cannot deny the possibility of a malignant lesion and the procedure may make an operable lesion incurable. One should avoid invasive examinations and perform open biopsy when CT scan indicates malignancy or the patient wants to undergo tumor resection. However, if the diagnosis remains indeterminate and the patient’s tolerance for surgery is uncertain, FNAB may be justified (9). One should take special care, such as using a smaller bore needle and avoiding multiple punctures with a single needle, because it is likely that contamination by more cancer cells will provide a better opportunity for tumor cells to grow along the needle tract.

Since the reported interval between FNAB and implantation tumor development ranged from 6 days to 30 months (8,10), careful examination for implantation should be performed for about 3 years.

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References