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The usefulness of scintigraphic assessment of thoracic splenosis — a case report

Abstract

Thoracic splenosis of the left lung and upper abdominal area was described. Left minithoracotomy was performed due to unclear results from a fine needle biopsy and following the suggestion to obtain a tissue sample. Clinical findings were similar to neoplasmatic disease; intraoperative extension of the disease was larger than CT view and correlated with postoperative assessment with ^{99m}Tc sulphur colloid. This confirmed the usefulness of scintigraphic assessment in preoperative diagnosis in order to avoid thoracotomy in such cases.

Key words: lung tumour, thoracic splenosis, scintigraphy

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Solitary pulmonary nodule can be diagnosed more precisely by its radiological features, i.e. its shape, opacity, quantity and location. Differential diagnosis should consider primary or secondary pulmonary neoplasm, benign lesions such as hamartomas and tuberculomas, unspecified inflammations, scars and intrapulmonary lymph nodes [1, 2]. Some of the nodules are described as having Ground Glass Opacity (GGO), especially solid-GGO [3]. The presence of inflammation or metabolic or other symptoms can help in diagnostics, but more often the majority of the nodules are symptom free [4]. Usually lung scintigraphy is not the routine method for the assessment of solitary pulmonary nodules. In this paper we describe the usefulness of Technetium ^{99m}Tc marked sulphur colloid lung scintigraphy to detect the range of pulmonary splenosis (autotransplantation or inoculation of spleen tissue to the lungs). This case mimicked that of solitary pulmonary nodule and was described previously in the Polish Journal of Surgery [1].

Case report

The patient, 43-years-old, hospitalized due to solitary pulmonary nodule in the left lung 2 cm in diameter, was symptom free and diagnosed radiologically accidentally. CT revealed multiple lesions of the left lung highly suspected of malignancy. In 1993 he had had a car accident and a laparotomy had been performed, although no medical record of splenectomy or diaphragmatic lesion was available. Physical examination revealed post-laparotomy scarring, and abdomen ultrasound did not show any spleen present. Bronchofibroscopy revealed no abnormalities and transthoracic FNAB showed mesenchymal cells. The pathologist suggested open lung biopsy, which gave the final diagnosis of spleen tissue autotransplantation [1]. After 12 months the patient came in for a check-up. Technetium ^{99m}Tc marked sulphur colloid lung scintigraphy was performed. The radio marker had a radioactivity of 700–800 MBq, the acquisition

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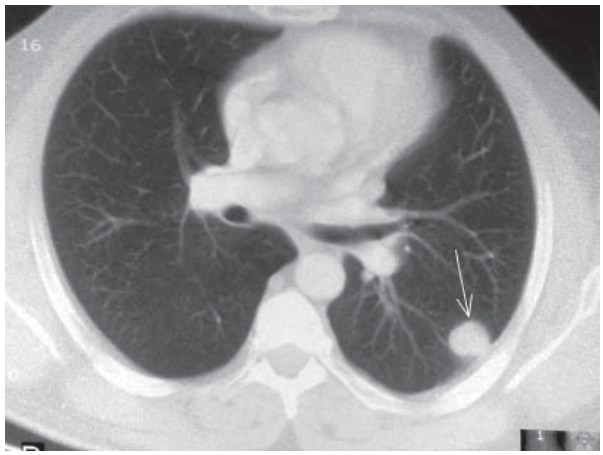

Figure 1. Solid tumor 2 cm of diameter visible in the chest computed tomography in the left lung near chest wall in scapular line (tumor marked by arrow)

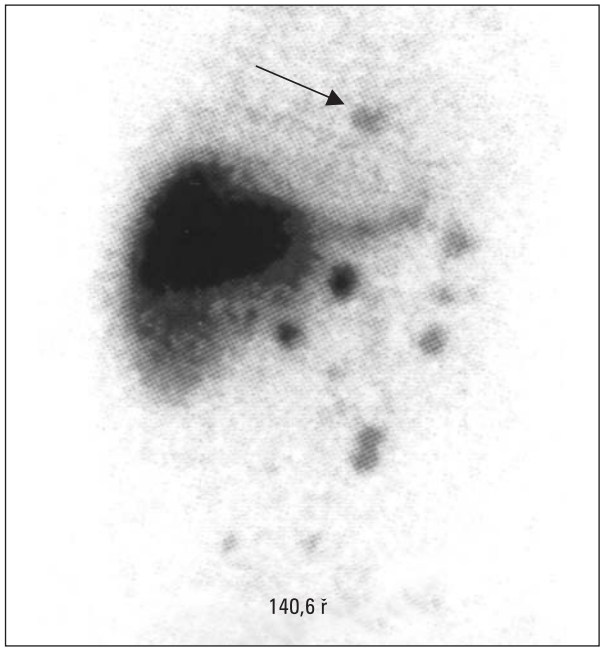

Figure 2. Numerous focuses of intensive concentration of ^{99m}Tc in the abdominal field and above of the left hemidiaphragm correlated with the left lung tumor in the chest computed tomography (tumor marked by arrow)

was done in static ad SPECT projections 30 minutes after infusion. A Nucline^{TM} X-Ring/R gamma camera, low energy collimator with 128 × 128 template and Mediso-Interview software were used [5, 6]. This examination revealed multiple peritoneal isotope concentrations as well as one pulmonary focus localized in the left lower pulmonary area. No features of asplenia were documented; Howell-Jolly bodies' index, erythrocytes variations and IgM antibodies titer were in the normal range (Fig. 1, 2).

Discussion

Solitary pulmonary nodule diagnostics are based on chest X-ray, computed tomography, bronchofibroscopy, sputum and bronchial excretion bacteriology and cytology, ultrasonography, lung function, tuberculin reaction, preoperative cytological FNAB or intraoperative examination of a surgically resected lesion [1, 7–9]. Usually bronchofibroscopy reveals nothing abnormal and FNAB is the most convenient method for lesions positioned close to the chest wall surface [1, 3, 10]. In some cases other body regions need to be assessed, i.e. the peritoneum. The most common pulmonary nodule aetiology is of neoplasmatic or inflammatory (specific or non-specific) origin and splenosis is rarely taken under consideration [5, 11–13]. Typically, former spleen contusion, posttraumatic or postoperative scar and no spleen in abdomen ultrasonography or computed tomography is characteristic [6, 13]. The splenosis develops by a penetrating thoraco-abdominal wound (car accident, stab wound, gun-shot), followed by spleen rupture and spleen tissue fragment migration to the inoculation sites, usually in the left pleural space [6, 14]. The expression of splenosis as a peritoneal inoculation was first introduced by Buchbinder and Lipkoff in 1939 [15]. The inoculation sites are predominantly symptom free, although sometimes concomitant by ileus, intrathoracic pain and haemoptysis [1, 16–18]. Usually they gain their own spleen activity expressed by a lack of pathologic erythrocytes, Howell-Jolly bodies and proper IgM titer in a blood sample. In literature, primary pulmonary splenosis is radiologically diagnosed in symptom-free patients a few years after physical trauma [6, 14]. Bronchoscopy reveals nothing abnormal and the FNAB pathology is difficult to interpret [1, 7, 19]. Our case was similar to this. In unclear diagnostic situations, nuclear medicine is of great benefit and splenosis suspicion is the indication to use it [5, 6, 14, 19, 20]. The presented case is the first, or one of the first, in Polish medical literature, especially in the diagnostics of the pulmonary lesions. Due to the diagnostics problem we were forced to perform minithoracotomy and open lung biopsy, but we did not consider this noninvasive method. Therefore, the lung scintigraphy was performed later, in a period suitable for the patient. This unique clinical state is managed in similar way worldwide. The number of described cases reaches about 30 [7, 11, 19]. The nuclear diagnostics of splenosis is based on sulphur colloid, own patient heat injured and Technetium ^{99m}Tc marked erythrocytes and by means of Ind ^{111}In marked thrombocy-

tes. These methods differ in technology and specificity [6, 14]. Sulphur colloid scintigraphy is technologically the easiest, cheapest, safest and most popular nuclear tool. On the other hand, this colloid accumulates in the other lymphatic tissues, especially in the liver, leading to the interpretation errors. The own patient heat injured and Technetium ^{99m}Tc marked erythrocytes as well as Ind ^{111}In marked thrombocytes show spleen inoculates specifically, but demand preparation and separation of own blood elements, which are potential risks. It also creates logistical difficulties and costs. The own erythrocytes scintigraphy is more sensitive than sulphur colloid scintigraphy in pulmonary splenosis. The fusion of SPECT/CT scans improves the method quality [5, 6, 14]. Unfortunately we could not overcome administrative barriers and import the proper marker for the purposes of the study.

Conclusion

Sulphur colloid lung scintigraphy enabled precise assessment of the splenosis range, it showed the feasibility of this method and is recommended for lung tumor diagnostic centres. The non-invasive treatment is favourable for splenosis diagnosed by FNAB and nuclear medicine [7].

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