WHOLE LUNG TOMOGRAPHY IN THE EARLY DETECTION AND FOLLOW-UP OF LUNG SECONDARIES FOLLOWING HYDATIDIFORM MOLE

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SUMMARY

22 patients with proven hydatidiform molar pregnancy were subjected to whole lung tomography. By this technique, lung metastases were detected in four patients when plain chest radiographs had shown no secondaries. In a fifth patient additional nodules not observed on the plain radiographs were seen. The usefulness of this procedure as an adjunct to existing methods of following up of patients with metastatic trophoblastic disease is discussed.

INTRODUCTION

Choriocarcinoma is a serious malignant disease in which the majority of cases are preceded by the benign hydatidiform mole. In Malaysia, the frequency of occurrence of hydatidiform mole is around 1:330 deliveries.[1] Choriocarcinoma in this region is preceded by a molar pregnancy in 85% of cases.[2] As the lungs are the commonest site for metastases in trophoblastic disease, a technique of whole lung tomography was used apart from plain chest radiographs. This method of management assisted in the early institution of cytotoxic chemotherapy and also in assessing response to treatment.

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MATERIALS AND METHODS

At the University Hospital, Kuala Lumpur from June 1978 to March 1980, 22 cases of hydatidiform mole were subjected to whole lung tomography. Tomography is a valuable radiographic technique which employs a special radiographic apparatus available in most hospitals in developing countries. A radiographic slice is made of an area and the tissues above and below this area of interest are blurred out. This considerably enhances radiographic contrast at the required level and clear images are produced. We used the Philips Polytome machine and the whole chest was sliced at one centimetre intervals starting from the spine to the sternum. Utilising this method, 10-12 large X-ray films were exposed and these were then carefully studied.

RESULTS

Plain Radiographs

Good quality plain chest radiographs of the 22 cases studied showed that one of the patients had

a nodular lesion demonstrated in the right mid zone. The rest of the 21 cases had no demonstrable abnormality. This was confirmed by a gynaecologist and two radiologists independently.

Whole Lung Tomography

By using this technique, four of the 22 cases being studied showed nodular opacities suggestive of secondaries that were not visible on plain chest radiographs. A fifth patient who had one nodular shadow in the right mid zone on the plain chest radiography showed an additional nodule in the left mid zone on tomography. The size of these nodules varied from 6 mm to 12 mm in diameter.

CASE REPORTS

L.S.E. is a 27-year-old female with molar pregnancy confirmed by histology. The chest radiography done three weeks after evacuation of the uterus showed a single nodular shadow in the right mid zone and her urine pregnancy test was positive. Whole lung tomograms demonstrated an additional nodule in the left mid zone of the chest (Fig. 1). After five courses of intravenous methotraxate a plain chest radiograph and tomograms were clear. A further three courses of methotraxate was given and she is now well and on regular follow-up.

C.S.M., aged 25 years, had molar pregnancy diagnosed by ultrasound. The uterus was evacuated on three occasions at one week intervals and histology confirmed molar tissue in the first two instances. However, her urine gravindex remained positive. Although a plain chest radiograph was normal, whole lung tomograms demonstrated three nodules in the chest (Fig. 2A & B). After a complete course of chemotherapy repeat tomograms showed no evidence of secondary deposits. She has been well for over four years.

Y.M.F. is a 23-year-old female with confirmed molar pregnancy by an amniogram and also by histology after evacuation. The plain chest radiograph done four weeks later was normal but tomograms showed a nodular shadow, 8 mm in diameter in the left mid zone. As radio-immunoassay facilities for estimation of HCG were not available then in this hospital, this was assumed to be a secondary and five courses of methotraxate were given. Subsequent chest radiograph and whole lung tomograms showed no change in size of the previously detected nodular density. A thoracotomy and a wedge resection of this nodule was done. On histology a hamartoma was diagnosed.

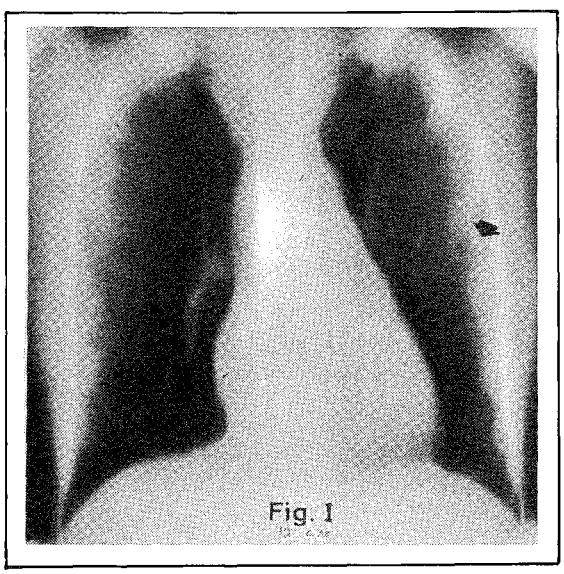

Fig. 1 Whole lung tomographic slice showing a well defined nodule (arrow) at the periphery of the left mid zone of the lung.

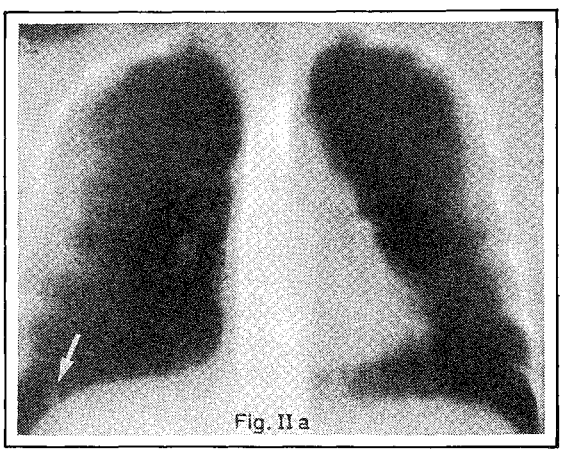

Fig. 2A Whole lung tomogram showing clearly a nodule in right costophrenic angle (white arrow).

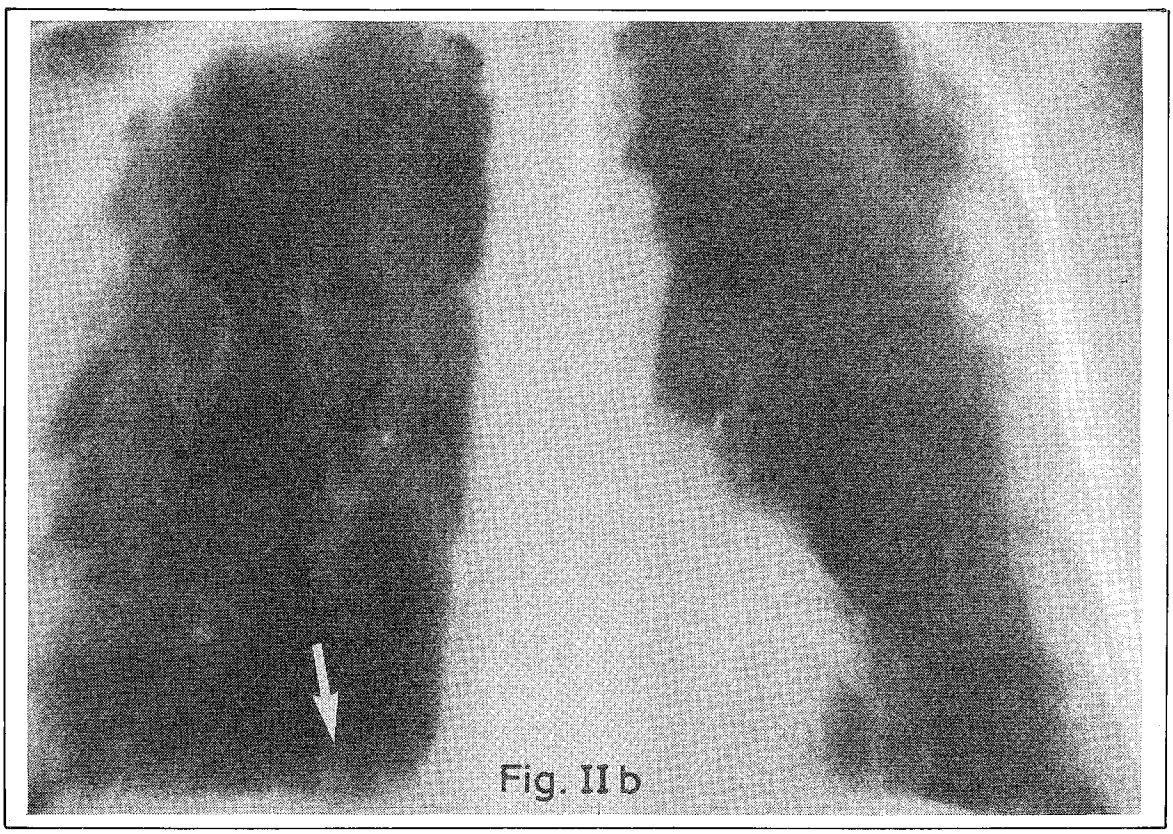

Fig. 2B Whole lung tomographic slice at a different level of the chest as compared to Fig. 2A showing a nodule at the right base (arrow).

A.M.I. is a 49-year-old female who had molar pregnancy in 1971 and had a hysterectomy done. Subsequent follow-up plain chest radiograph showed multiple secondary deposits. A diagnosis of choriocarcinoma was made. After several courses of methotraxate chemotherapy, the secondary deposits cleared completely and the chest radiograph done showed no abnormality. She has been on regular follow-up at the University Hospital ever since. A plain chest radiograph done in 1980 (after nine years) was clear. However, whole lung tomography of her chest showed a nodular shadow in the left lower zone (Fig. III). She was otherwise very well. Radioimmunoassay for HCG was subsequently found to be negative.

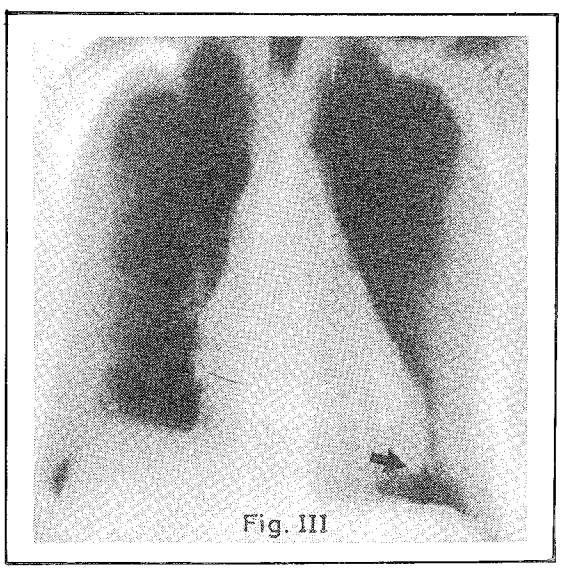

Fig. 3 A tomographic slice of the whole lung showing a nodule at the left base (arrow).

N.O.R. is a 35-year-old gravida eight, para six, admitted for missed abortion. Her urine gravindex

test was positive and an ultrasonic examination of the uterus showed mixed echoes suggestive of molar pregnancy. Dilation and curretage was carried out and histology confirmed molar tissue. The plain chest radiography was clear but whole lung tomography showed a nodular shadow in the right hilar region. Follow-up tomograms of lungs done later showed that the previously detected nodule was now not visible. This disappearance of benign metastatic disease is not unusual. However, we feel that chemotherapy should not be withheld when secondary deposits are visualised on radiographs and HCG levels are high.

DISCUSSION

This study shows that if plain chest radiographs are used to monitor the presence of secondary deposits, then a normal radiograph does not necessarily exclude their presence. As pulmonary metastases are the most common in trophoblastic disease their detection therefore helps in the management of choriocarcinoma.

Although follow-up of these patients is ideally carried out with frequent HCG estimations, it is our experience that radiological signs often lag behind the fall in HCG levels and that even when HCG levels are normal, the lung shadows sometimes persist. Therefore, in those places or countries where facilities for estimation of HCG levels do not exist, it is our view that it is not hazardous to recommend that tomograms of the lungs be used for determining completeness of treatment. However, it should be noted that not all nodules detected in this manner are metastatic lesions as demonstrated in Case 3, where it turned out to be a hamartoma.

Computerised tomography (CT) today has altered the management of malignant disease. The detection of secondary deposits by CT is more sensitive than plain tomography particularly for detecting nodules along the pleura.[3] But CT being expensive and not readily available in most hospitals in the developing countries, lung tomography remains a sensitive and a cheap method of detection of nodules in the lungs. Moreover, it should be realised that CT is yet unable to visualise the tissue specificity of a nodule[3] and therefore will still be unable to differentiate hamartomas from malignant tissue.

REFERENCES

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[3] Kreel L. *Medical Imaging.* Aylesbury: HM + M Publishers, 1979:133.