

# CANNON BALL SECONDARIES?

R Nagaraja, R Sandhyav

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## Abstract

Multiple pulmonary nodules on chest x-ray, known commonly as cannon ball secondaries, are the classical presentation of haematogenous dissemination of a malignant tumor to the lungs. This almost always indicates advanced stage of the disease with a very grim outlook in terms of cure or survival. But there are numerous causes for multiple pulmonary nodules and their interpretation as cannon ball metastases should be viewed with caution. Here we present one such instance of "non-malignant" multiple pulmonary nodules.

## CASE REPORT

A-37-year old male, chronic alcoholic and smoker, with no previous medical comorbidities, presented to us with a ruptured liver abscess and generalised peritonitis. The patient was taken up for emergency laparotomy after resuscitation. Intraoperative findings were: purulent peritoneal fluid, a large abscess cavity in segment 4-5 of the liver and an inflamed gallbladder. After thorough peritoneal lavage and drainage of peritoneum and abscess cavity, the abdomen was closed. Post-operatively, there was persistent drainage of blood-stained fluid from the abscess cavity drain and the patient developed productive cough with haemoptysis. A chest x-ray was taken (figure 1) and revealed multiple pulmonary nodules and obliteration of the costo-phrenic angles bilaterally.

## Figure 1

Figure 1: Chest x-ray, PA view, showing multiple pulmonary nodules and obliteration of the costo-phrenic angles bilaterally



Culture of both peritoneal fluid and sputum revealed growth of *Pseudomonas aeruginosa* and cytology of drain fluid for malignant cells was negative. A possibility of malignant liver tumor was thought of because of persistent drainage of blood stained-fluid (beyond 2 weeks; >100cc/day), multiple pulmonary nodules on chest x-ray, and persistence of the abscess cavity on abdominal ultrasound post-operatively.

Because of financial problems and lack of facility no further investigation was done and the patient was referred to the regional cancer institute for further management. The patient did not go to the centre and was seen in our outpatient department after 2 months. He is healthy now, with improved appetite and weight, and asymptomatic. His chest film, at review (figure 2), was almost normal and abdominal ultrasound revealed a much smaller, resolving liver abscess.

### Figure 2

Figure 2: Review chest x-ray showing disappearance of the pulmonary nodules



## DISCUSSION

Multiple pulmonary nodules seen on plain chest x-ray have a multitude of causes, starting from metastases (cannon ball secondaries), various infections, immunological diseases to arterio-venous malformations<sup>1</sup>.

Pulmonary metastases in adults are usually from breast, kidney, gut, testes, head-neck tumors and a variety of sarcomas. The basic sign of haematogenous pulmonary metastases is one or more discrete pulmonary nodules. The nodules are usually spherical and well-defined, but they may

be almost of any shape and can occasionally have a very irregular edge, especially in adenocarcinoma<sup>2</sup>. Calcification is very unusual except in osteo/chondrosarcoma. Secondary deposits can also present as miliary mottling throughout the lung fields or with extensive perihilar spread (lymphangitis carcinomatosa)<sup>3</sup>.

Septicemic infections by *Staphylococcus aureus* cause disseminated, multifocal, nodular consolidations which can cavitate<sup>4</sup>. This type of infection may be seen in drug addicts, immunocompromised patients, and patients with infective endocarditis or indwelling catheters. Gram-negative pneumonias in hospital setting are commonly caused by enterobacteria, *Pseudomonas aeruginosa*, and *Haemophilus influenzae*. These agents are the most common cause of nosocomial pneumonia. Patients affected are invariably debilitated by chronic lung disease, major medical conditions, or surgery. The radiological patterns are similar to those seen with *Staphylococcus aureus*<sup>4</sup>.

Finally, a word on tumor rupture in hepatocellular carcinoma (HCC): Tumor rupture in HCC presents as an acute abdomen as a result of haemoperitoneum. Such presentation occurs in 5% of patients with HCC<sup>5</sup>.

The aim of this presentation is to emphasise that, although metastases are an important and common cause of multiple pulmonary nodules on plain chest film, the diagnosis should be made with caution taking into consideration all the relevant data available about the patient and the various differential diagnoses for multiple pulmonary nodules, mainly the infective causes.

## References

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**Author Information**

**Raghavendra Nagaraja, M.B.B.S., M.S.**

Assistant Professor, Department of Surgery, Mysore Medical College and Research Institute

**Rommel Sandhyav, M.B.B.S.**

Resident, Department of Surgery, Mysore Medical College and Research Institute