

Image of the Issue

Radiological Findings in a case of Advance staged Mesothelioma

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ABSTRACT Chest X Ray is the initial screening test for the mesothelioma like all other the chest diseases. But computed tomography (CT) is the imaging technique of choice for charactering pleural masses. CT also gives important information regarding invasion of the chest wall and surrounding structures. Certain CT features help differentiate benign from malignant processes. This short article highlights the salient CT appearance of mesothelioma; the most common pleural tumor.

KeyWords: Advance staged Mesothelioma; Radiological Findings

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Mesothelioma is a malignant neoplasm originating from the mesothelium, a protective lining that covers most of the body's internal organs. Its most common site is the pleura but it may arise from the peritoneum and the pericardium.

Asbestos exposure is thought to be the single most important

factor in the development of mesothelioma. The clinical latency period between asbestos exposure and mesothelioma development is 35-40 years.

Pathological types of Mesothelioma:

Epithelioid	Sarcomatoid	Biphasic
55-66% of all mesotheliomas.	10-15% of all mesotheliomas.	20-35% of all mesotheliomas.
Overall, better median survival time.	Pathologically similar to true sarcomas.	Pathologically, has both epithelioid and sarcomatoid features.
Pathologically, it can appear similar to adenocarcinoma of the lung.		

Staging of Mesotheliomas:

The two important systems for the mesothelioma classification are Burchart system and TNM classification.

The Butchart staging system ^[1] for malignant pleural mesothelioma is as follows

Stage I	Tumor confined to the ipsilateral pleura, lung or pericardium
Stage II	Tumors invades the chest wall or mediastinal structures or metastasis to the thoracic lymph nodes
Stage III	Tumor penetrates the diaphragm to involve the peritoneum or metastasizes to the extra-thoracic lymph nodes
Stage IV	Distant blood-borne metastases

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Radiological findings of Mesothelioma

Chest X Ray:

Here we present CXR from 64 year old Hispanic male who was diagnosed with advanced mesothelioma;

The most common mesothelioma finding on radiographs is unilateral, concentric, plaque like, or nodular pleural thickening.

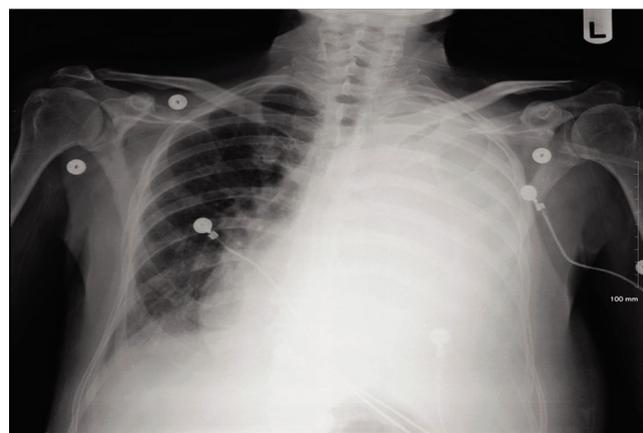


Fig. 1 Chest X- ray showing a large mass on left side with the slight shift of mediastium towards right.

Pleural effusions are common and may obscure the presence of the underlying pleural thickening. The tumor frequently extends into the fissures, which become thickened and irregular in contour. A slight right-sided predominance is observed, possibly because of a larger pleural surface area. The tumor can rigidly encase the lung, causing compression of lung parenchyma, diaphragm elevation, inter-costal space narrowing, and mediastinal shift toward the tumor. Calcified pleural plaques are present in 20% of patients with mesothelioma and are usually related to the previous asbestos exposure.

Lung nodules and hilar masses usually result from direct mesothelioma tumor extension into the lung parenchyma and mediastinal structures, such as lymph nodes, the pericardium, and the heart. Although usually unilateral, direct extension of the tumor across the mediastinum into the contralateral hemi-thorax does occur.

Although a definite diagnosis cannot be made on the basis of plain film findings, new unilateral pleural thickening or effusion in a patient who has a history of exposure to asbestos is highly suggestive of mesothelioma.

Computed Tomography

Here we show the CT scan of the chest from the same patient diagnosed with advanced mesothelioma;

CT scan findings are similar to those of plain films but are seen better and in more detail. Furthermore, pleural thickening and effusion can be distinguished with CT scanning. Nodular pleural thickening, pleural thickening greater than 1 cm, involvement of the mediastinal pleural surface, and concentric pleural thickening are all highly suggestive of malignant pleural disease, either mesothelioma or metastases. The tumor extent along the pleural surfaces and into the mediastinum, diaphragm, or chest wall can be evaluated much better with CT scanning than plain radiography. Chest wall invasion manifests as obliteration of fat planes or chest wall nodules. Diaphragmatic invasion, ascites, and omental caking are common CT scan findings of peritoneal mesothelioma.

Benign pleural plaques or pleural thickening from asbestos exposure may mimic the appearance of nodular pleural thickening in patients with mesothelioma.

Conclusion:

Chest radiograph is the initial screening examination but chest radiograph has limited usefulness. The X-ray findings of mesothe-

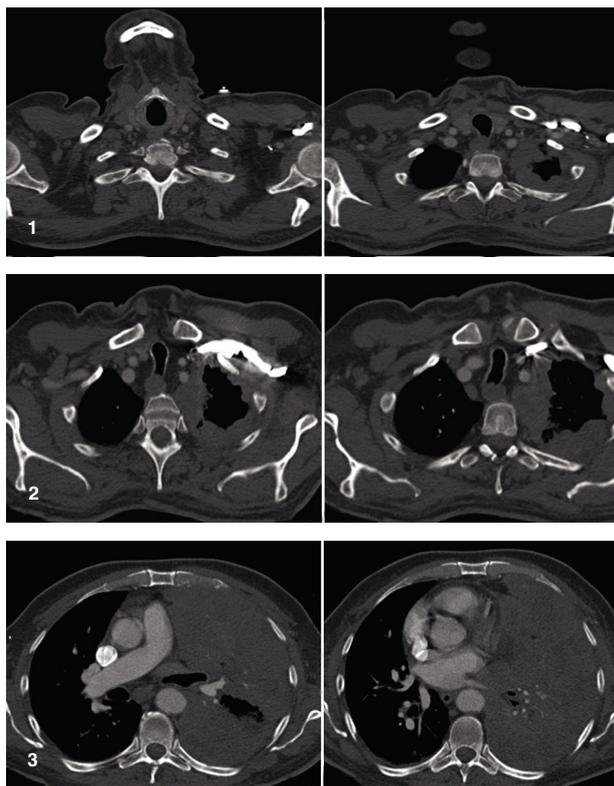


Fig. 2 This CT scan is showing:

1. Large soft tissue mass lesion in the left chest cavity.
2. Narrowing of the left upper lobe pulmonary artery which is encased by the soft tissue mass lesion.
3. Mild narrowing of the left lower lobe pulmonary artery is also present.

lioma are non specific and observed in other disease, including metastatic carcinoma, lymphoma and benign asbestos disease. Disease extent is frequently underestimated in radiographs. CT scanning provides more and better information than plain radiography with regard to tumor characteristic and extent. But neither CT scan nor MRI provides unequivocal diagnosis of mesothelioma and tissue biopsy is always required for the definitive diagnosis.

References:

1. Butchart EG, Ashcroft T, Barnsley WC, Holden MP. Pleuropneumonec-tomy in the management of diffuse malignant mesothelioma of the pleura. Experience with 29 patients. *Thorax* 1976; 31: 15-24.