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Lymphangitis carcinomatosa in thin section computed tomography

High resolution computed tomography is a diagnostic method of choice in the evaluation of lung parenchyma. HRCT enables the evaluation of small interstitial changes, invisible on plain chest radiographs, and their assessment at the level of the lung lobule.

The aim of the study was the assessment of typical findings in HRCT in *lymphangitis carcinomatosa*, enabling differential diagnosis.

MATERIAL AND METHODS

Material comprises a group of 18 patients with lymphangitic spread of carcinoma, in whom HRCT examination was performed. The CT examination was performed with patients in a supine position. Scanning was made from lung apices to the level of diaphragm, at full inspiration. Additional expiratory sections were performed to diagnose and differentiate air-trapping. In patients with changes in dependent lung areas additional scans in a prone position were achieved.

RESULTS

In all patients thickenings of the peribronchovascular interstitium were seen (Fig. 1), and in 15 of them they are nodular. Nodular thickenings of interlobular septa were visible in 14 patients. Small nodules were visible in all patients. They usually were adjacent to thickened peribronchovascular and septal interstitium, resulting in their nodular appearance. Parenchymal bands were seen in seven cases. In three patients bronchiectases were found, visible as tram-line and signet-ring signs (Fig. 2). Areas of ground glass opacities were seen in six patients. In 11 patients were seen well-defined multiple nodules, about 1 cm in diameter, with distinct smooth margins, relating to metastatic lesions (Fig. 3). In four patients larger solitary nodules were also seen (Fig. 4).

In one patient multiple metastasis nodules were seen in two patients, and were better visualized on thicker, 10 mm slices (Fig. 5).

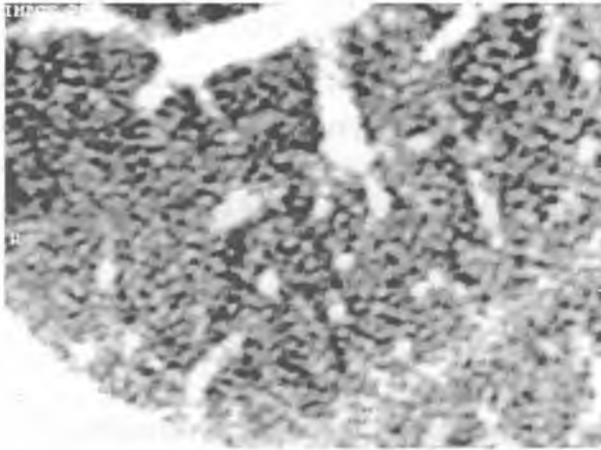


Fig. 1. Thickenings of the peribronchovascular interstitium



Fig. 2. Small nodules, peribronchovascular thickenings and bronchiectasis



Fig. 3. Small solitary metastasis nodules, peribronchovascular thickenings



Fig. 4. A solitary subpleural nodule in the left lung. Small nodules, peribronchovascular thickenings



Fig. 5. 10 mm thick CT section. Multiple metastasis nodules clearly seen in both lungs

DISCUSSION

Lymphangitic spread of carcinoma is most frequent in patients with cancers of breast, lung, stomach, pancreas, prostate, thyroid gland. The lymphatic spread of the tumor results in smooth or more frequent nodular interstitial thickening. Typical findings of the lymphangitic spread of carcinoma in HRCT are smooth or nodular thickenings of peribronchovascular interstitium (6, 8). In the studied group of patients they were found in 62% of cases.

Smooth or nodular thickenings of the interlobular septa are also typical findings in lymphangitic spread of carcinoma. They result in the increased reticular pattern seen on HRCT. In some patients thickenings of intralobular interstitium are visible, and result in the prominence of small vessels and bronchioles. In the lymphangitic spread of carcinoma preserving the normal architecture of the interstitium at the level of the lung lobule is typical, despite the presence of the reticulo-nodular and linear opacities (4, 5, 6, 8).

In the related literature reticular opacities in the peripheral, subpleural lung areas were described in all cases, and thickening of the interlobular septa in 50% of patients (6). Interstitial thickenings were described in 86% of patients (5). In the studied group they were seen in 69% of cases, as thickening of peribronchovascular interstitium and thickenings of interlobular septa. Septal thickenings with prominent centrilobular structures are believed to be typical features of lymphangitic spread of carcinoma (4, 5, 6, 8).

Small nodules are typical findings in *lymphangitis carcinomatosa*. Nodules are usually adjacent to the thickened peribronchovascular interstitium, resulting in their nodular appearance, a characteristic form of *lymphangitis carcinomatosa*. In some cases small nodules and thickening of the peribronchovascular and septal interstitium coexist with large metastatic nodules, 1 cm or more in diameter (2, 4).

Differential diagnosis of the lymphangitic spread of carcinoma include interstitial lung edema, sarcoidosis, pneumoconiosis and pulmonary fibrosis (1, 3, 6, 7).

In the lymphangitic spread of carcinoma the interstitium is well-separated from adjacent aerated lung, without filling the lung alveoli, which remain aerated. In the lung edema the lung alveoli are filled with fluid. The thickening of the interlobular septa in the lymphangitic spread of carcinoma are more inhomogeneous than in lung edema. The lung edema is usually bilateral and symmetrical, while lymphangitic spread of carcinoma may be focal and asymmetrical.

The lung edema is gravity-dependent, the left atrium and ventricle may be enlarged, the pleural effusion is frequent (6).

In sarcoidosis and pneumoconiosis thickenings of interlobular septa are more intense, and reticular opacities are not predominant features. Distortion of the parenchymal architecture is often seen in sarcoidosis, while in the lymphangitic spread of carcinoma lung architecture remains unchanged, and lobules preserve their size and shape (1, 6, 7, 8).

CONCLUSIONS

Nodular thickening of the peribronchovascular interstitium and interlobular septa are typical in the lymphangitic spread of carcinoma. Smooth peribronchovascular and septal thickenings are typical in sarcoidosis, and are seen only in some patients in the lymphangitic spread of carcinoma. In *lymphangitis carcinomatosa* lung architecture remains unchanged, which allows differentiating from sarcoidosis.

REFERENCES

1. Akira M. et al.: Radiographic type p pneumoconiosis: High-resolution CT. *Radiology*, 171, 117, 1989.
2. Gaeta M. et al.: Carcinomatous solitary pulmonary nodules: Evaluation of the tumor-bronchi relationship with thin-section CT. *Radiology*, 187, 535, 1993.
3. Gruden J. et al.: Multinodular diseases: Anatomic localization at thin-section CT-multireader evaluation of a simple algorithm. *Radiology*, 210, 711, 1999.
4. Johkoh T. et al.: CT Findings in lymphangitic carcinomatosis of the lung: Correlation with histologic findings and pulmonary function test. *AJR*, 158,1217, 1992.
5. Munk P. et al.: CT and pathologic findings. *Radiology*, 166, 705, 1988.
6. Schaefer-Prokop C. et al.: High-resolution CT of diffuse interstitial lung disease: Key findings in common disorders. *Eur. Radiol.*, 11, 373, 2001.
7. Traill Z. C. et al.: High-resolution CT findings of pulmonary sarcoidosis. *AJR*, 168, 1557, 1997.
8. Webb W. et al.: High-Resolution CT of the Lung. *Lipincott-Raven* 1996.

SUMMARY

High resolution computed tomography is a diagnostic method of choice in the evaluation of lung parenchyma. HRCT enables the evaluation of small interstitial changes, invisible on plain chest radiographs, and their assessment at the level of the lung lobule. The aim of the study was the assessment of typical findings in HRCT in *lymphangitis carcinomatosa*, enabling differential diagnosis. Material comprises a group of 18 patients with lymphangitic spread of carcinoma, in whom HRCT examination was performed. Nodular thickening of the peribronchovascular interstitium and interlobular septa are typical in lymphangitic spread of carcinoma. Smooth peribronchovascular and septal thickenings are typical in sarcoidosis, and are only seen in some patients in the lymphangitic spread of carcinoma. In *lymphangitis carcinomatosa* lung architecture remains unchanged, which allows differentiating from sarcoidosis.

Lymphangitis carcinomatosa w tomografii komputerowej wysokiej rozdzielczości

Tomografia komputerowa wysokiej rozdzielczości jest metoda diagnostyczną z wyboru w ocenie miąższu płucnego. TKWR umożliwia uwidocznienie zmian śródmiąższowych niewidocznych na zwykłych radiogramach kłp oraz ich ocenę na poziomie zrazika płucnego. Celem pracy była ocena typowych zmian morfologicznych w TKWR w *lymphangitis carcinomatosa*, umożliwiających diagnostykę różnicową. Materiał stanowiła grupa 18 pacjentów z *lymphangitis carcinomatosa*, u których wykonano badanie TKWR. Guzkowate zagęszczenia śródmiąższu okołoskrzelowo-naczyniowego i przegród międzyzrazikowych są tu typowe. Gładkie zagęszczenia okołoskrzelowo-naczyniowe i przegrodowe typowe dla sarkoidozy są rzadko widziane u pacjentów z *lymphangitis carcinomatosa*. W *lymphangitis carcinomatosa* architektura miąższu pozostaje niezmienną, co umożliwia różnicowanie z sarkoidozą.