

**Abstract**

**A Case of Malignant Pleural Mesothelioma Induced by Crocidolite**

Jong Rae Roh, Jin Gun Sohn, Hye Ran Song, Jin Ha Kim, Jin Gon Seol<sup>1)</sup>

*Department of Occupational and Environmental Medicine, Gospel Hospital, Kosin University  
Department of Preventive Medicine, College of Medicine, Pusan National University<sup>1)</sup>*

Asbestos exposure may cause asbestosis, pleural plaques and benign pleural disease, and may give a predisposition to malignant mesothelioma in occupationally exposed workers. This case report describes a 50-year-old man, dying from histologically confirmed, diffuse, malignant mesothelioma after asbestos exposure. As a young man, he had been exposed at the workplace to crocidolite for 2 years, but he had no other known history of occupational or environmental asbestos exposure. The patient presented with chest pain and general weakness. Computed tomography showed bilateral irregular pleural thickening along both lower lateral chest walls and a low attenuating mass in the anterior portion of the left lobe. Pathological examinations revealed that it was an epithelial type with tubulopapillary structures and it tested immunohistochemically positive for antibodies against cytokeratin, calretinin and vimentin. The patient was started on chemotherapy but he died to the disease at ten months after the first onset of the symptoms. Mesothelioma is a rare neoplasm in the general population. Nevertheless, the importance of close medical surveillance of the high-risk population is emphasized, because of increased asbestos exposure.

**Key Words:** Malignant mesothelioma, Crocidolite

1995; Kang et al, 1998; Lim et al, 2001) 1993  
55  
(Park et al,  
1995)  
Klemperer 6 ( (1931)  
, 2004).  
Wagner (chrysotile)  
(crocidolite)  
가 . 2  
가 (Lee et al, 1990; Park et al, 1

OO, 50  
 : 5  
 : 5  
 4  
 가  
 OO  
 : 30  
 : 1 pack/day x 30 years  
 : 1977  
 OO 1  
 가  
 1979 6 18  
 2 12  
 가 가  
 1973  
 1979 6  
 가  
 : 130/90 mmHg,  
 64 / , 20 / , 37  
 168 cm,

50 kg  
 Hb  
 10.6 g/dl, Hct 34.1%, WBC 5,860/mm<sup>3</sup> (neutrophil 67%), PLT 581,000/mm<sup>3</sup>  
 CEA 0.92 ng/ml, AFP 2.44 ng/ml, CA19-9 1.27 ng/ml  
 가 pH 7.403, Pco<sub>2</sub> 45 mmHg, Po<sub>2</sub> 68.2 mmHg, HCO<sub>3</sub> 28.4 mmol/L, 93.1%  
 (A-a)DO 25.1 mmHg 가 FVC 1.34 L( 30.9%), FEV 1.19 L( 36.2%), FEV/FVC 88% 가 DLco 11.8 ml/min/mmHg( 56%) 가 500 ml protein 2.5 g/dl, WBC 400/mm<sup>3</sup>( 3%, 97%), , AFB 가  
 X :



**Fig. 1.** Chest radiography shows diffuse pleural thickening along both lower chest wall and costophrenic angle.



**Fig. 2.** Chest CT scan shows bilateral irregular pleural thickening noted along the both lower lateral chest wall.

가

가

가

가

가

1

cm

(cytokeratin),  
(vimentin), (calretinin)  
CEA(carcinoembryonic antigen) EMA  
(epithelial membrane antigen)

가 4

16

39 kg 6 11 kg



Fig. 3. Contrast enhanced abdominal CT scan shows low attenuating mass in the anterior portion of the left lobe of liver.

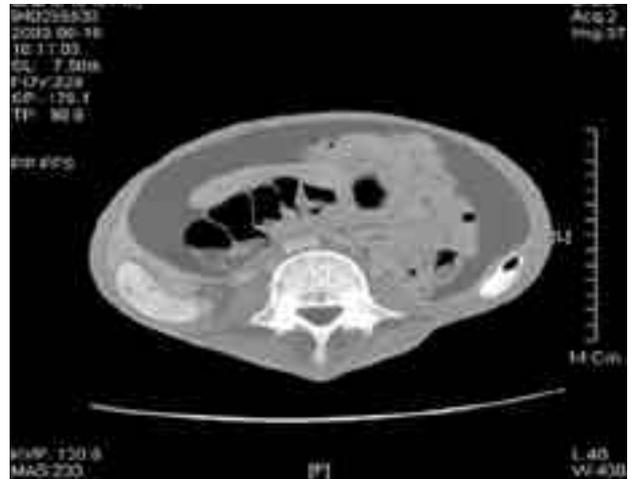


Fig. 4. Contrast enhanced CT scan shows massive ascitic fluid with diffuse peritoneal thickening. There is low attenuating mass around the ascending colon.

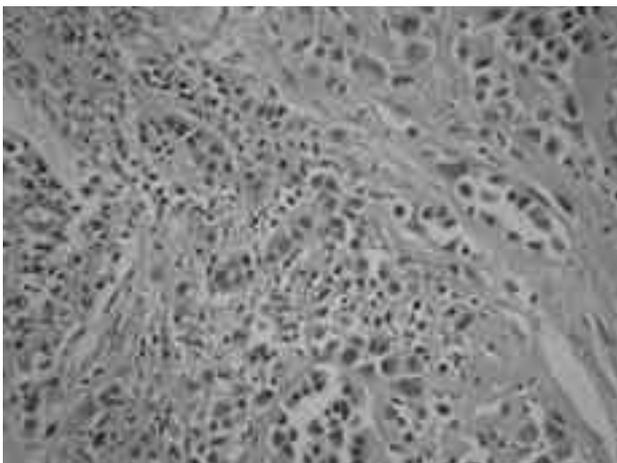


Fig. 5. The tumor cell have pleomorphic, vesicular nuclei with eosinophilic nucleoli and moderate amount of cytoplasm. A cluster of anaplastic mesothelial cells having hyperchromatic, pleomorphic nuclei is seen (H & E × 400).

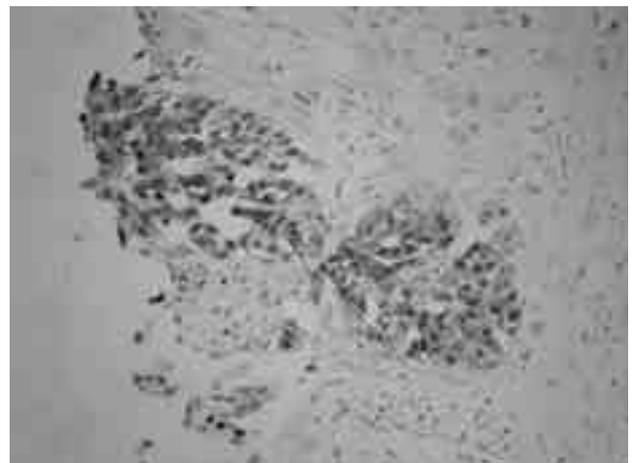


Fig. 6. Immunohistochemical staining for calretinin. Note the strong positive reaction: tumor cells were changed into brown color.

17 2 2005

20 adriamycin, doxorubicin, cisplatin  
가 2

1930  
1983

95%

1997

가

가  
(Wagner et al, 1974).  
80% 가  
40~60 , 2:1~3:1 (Legha & Muggia, 1977)

20~30 (Borow et al, 1973)

1977

가  
(Muscat & Wynder, 1991;

25

Albin et al, 1999).

1993 8

18

55

(Park et al, 1995)

6

4

가

가

80~90%

40~50

. Begin(1989)

가 0.25

( , 2004).

$\mu\text{m}$  가 8  $\mu\text{m}$  가

100

가

가

1

SEER(Surveillance, Epidemiology and End Results)

10

1.9

10

(amphibole) 가 가

0.4

(Price & Ware, 2004)

(serpetine)

가

(Borow

가

et al, 1973).

(amosite),

(tremolite) 가

가

(Whitwell & Rawcliffe,1971).

가

20

(Ratzer et al, 1967).

가

(50%),

(16%),

(34%) 3

가

가

2

(anaplasia),  
(tubular) (tubulopapillary)  
(Legha & Muggia, 1977).

cytokeratin, vimentin, calretinin  
CEA EMA

가 cytokeratin, vimentin, CEA, EMA, Leu - MI antigen

(Kamiya & Eimoto, 1990). cytokeratin vimentin  
CEA

2002-2  
2002.

. 2004

B72.3, Ber-EP4, HMFG-2

2004-84-

566. 2004.

(Kamiya & Eimoto, 1990).  
atin, vimentin

cytokeratin, vimentin  
CEA, EMA

Albin M, Magnani C, Krstev S, Rapiti E, Shefer I. Asbestos and cancer: An overview of current trends in Europe. *Environ Health Perspect* 1999;107 suppl (2):289-98.

Antman KH, Blum RH, Greenberger JS, Flowerdew G, Skarin AT, Canellos GP. Multimodality therapy for malignant mesothelioma based on a study of natural history. *Am J Med* 1980;68(3):356-62.

Begin R, Cantin A, Masse S. Recent advances in the pathogenesis and clinical assessment of mineral dust pneumoconiosis: asbestosis, silicosis and coal pneumoconiosis. *Eur Respir J* 1989;2(10):988-1001.

et al, 1980).

(Antman

Borow M, Conston A, Livornese L, Schalet N. Mesothelioma following exposure to asbestos: a review of 72 cases. *Chest* 1973;64(5):641-6.

De Pangher Manzini V, Brollo A, Franceschi S, De Matthaieis M, Talamini R, Bianchi C. Prognostic factors of malignant mesothelioma of the pleura. *Cancer* 1993;72(2):410-7.

8 ~ 14 , 4 ~ 12 가  
(Manzini & Brollo, 1993)

Kang DM, Kim JW, Son BC, Kim JI, Woo JC, Lee JT. A case of malignant pleural mesothelioma combined with asbestosis in a boilermaker and plumber. *Kor J Occup Environ Med* 1998;10(4): 610-7.(Korean)

(Antman et al, 1980).

Kamiya M, Eimoto T. Malignant mesothelioma of the tunica vaginalis. *Pathol Res Pract* 1990;186(5): 680-4.

10

Klemperer P, Rabin CB. Primary neoplasm of the pleura: A report of 5 cases. *Arch Pathol* 1931;11:385-412.

: 2  
1

Lee MC, Cho CH, Kim SK, Chang J, Kim SK, Lee WY. A case of malignant mesothelioma of pleura associated with hypoglycemia. *Tuberc Respir Dis* 1990;37(4):428-33.(Korean)

Legha SS, Muggia FM. Pleural mesothelioma: clinical features and therapeutic implications. *Ann Intern Med* 1977;87(5): 613-21.

Lim HS, Kim DH, Choi JK, Kang SK. A Case of Malignant

- Mesothelioma Occurred to Occupational Safety Manager Tested Asbestos Blanket. *Dong kook Med* 2001;8:148-56. (Korean)
- Muscat JE, Wynder EL. Cigarette smoking, asbestos exposure, and malignant mesothelioma. *Cancer Res* 1991;51(9):2263-7.
- Park MI, Choi JS, Choi HM, Jang TI, Moon IH, Kim JH, Jang TW, Lee DH, Jung MH. A case of diffuse malignant pleural mesothelioma with occupational asbestos exposure. *Kor J Med* 1995;48(4):526-30.(Korean)
- Price B, Ware A. Mesothelioma trends in the United States: an update based on Surveillance, Epidemiology, and End Results Program data for 1973 through 2003. *Am J Epidemiol* 2004;159(2):107-12.
- Ratzer ER, Pool JL, Melamed MR. Pleural mesotheliomas. Clinical experiences with thirty-seven patients. *Am J Roentgenol Radium Ther Nucl Med* 1967;99(4):863-80.
- Wagner JC, Berry G, Skidmore JW, Timbrell V. The effects of the inhalation of asbestos in rats. *Br J Cancer* 1974;29(3):252-69.
- Wagner JC, Sleggs CA, Marchand P. Diffuse pleural mesothelioma and asbestos exposure in the North Western Cape Province. *Br J Ind Med* 1960;17:260-71.
- Whitwell F, Rawcliffe RM. Diffuse malignant pleural mesothelioma and asbestos exposure. *Thorax* 1971;26(1):6-22.