



가 , CT  
 25 ( 59 , : =11:14).  
 (Rapidia; 3DMED, Seoul, Korea) CT ,  
 (%)  
 : 67.24 ± 19.03 cm<sup>2</sup>, 32.55  
 ± 11.91 cm<sup>2</sup> .  
 280.48 ± 74.43 mm<sup>2</sup>/kg/m<sup>2</sup>, 137.06 ± 41.76 mm<sup>2</sup>/ kg/m<sup>2</sup> .  
 : (p<0.0001).  
 (%) (rho=0.43, p=0.032).  
 :

가  
 (1).

fibrosis	PACS	idiopathic pulmonary
1	IPF	, 1998 1
2004 2 28		

25 (M:F=11:14)

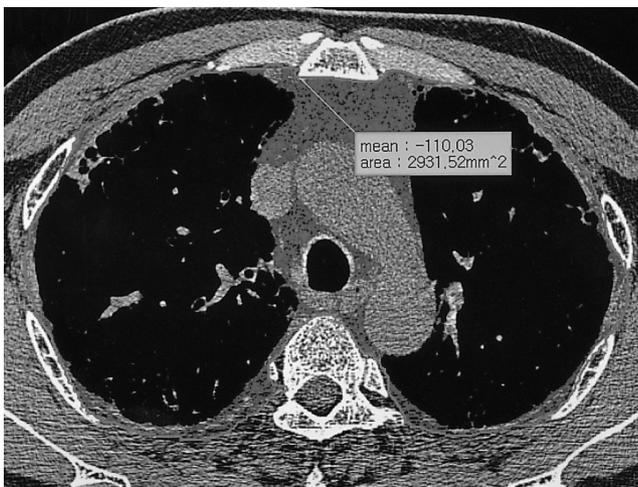
CT

25 (M:F=11:14)

(bias)

(140 kVp, 250 - 280 mAs, 1 mm slice thickness, 1 cm reconstruction interval, reconstruction by high - spatial - frequency reconstruction algorithm) CT (Somatom Plus - 4 scanner, Siemens Medical Systems, Erlangen, Germany; Somatom Plus - S scanner, Siemens Medical Systems; Hi - Speed Advantage, GE Medical Systems, Milwaukee, WI, U.S.A.).

(S1), (S2), (S3)



**Fig. 1.** Measurement of the area of fat. On the CT section of aortic arch, the inner margin of the ribs is delineated as a white line. Blue-colored area within the white line corresponds to the fat (areas between - 190 and - 50 HU). Automatically calculated area of fat is noted in the box (mm<sup>2</sup> in the figure represents mm<sup>2</sup>).

가 (Rapidia; 3DMED, Seoul, Korea) 가 Rapidia CT (window width 300, window level 20)

Hounsfield unit (HU)

- 190 ~ - 50

(2, 3) (Fig. 1).

가 CT

CT

(Fig.

2).

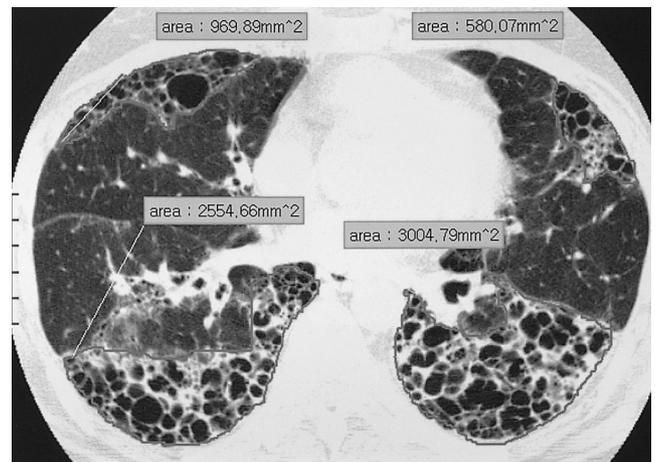
S1, S2, S3

(4 - 6).

student t - test

S1, S2, S3

(%)



**Fig. 2.** Measurement of the area of honeycombing. On the CT section of right inferior pulmonary vein, the boundary between honeycombing and normal lung is delineated as a white line. Blue-colored area within the white line corresponds to the honeycombing. Calculated area of honeycombing is noted in the boxes (mm<sup>2</sup> in the figure represents mm<sup>2</sup>).

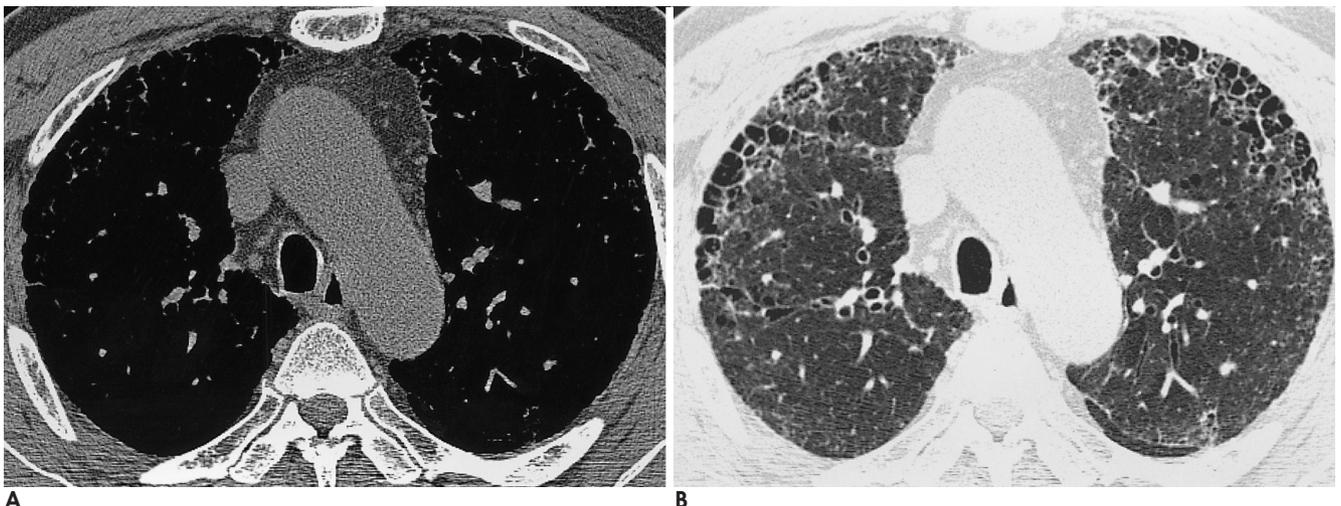
(%) Pearson's correlation analysis (%)  
 (rho=0.43, p=0.032) S1 (rho=0.41, p=0.041)  
 S3 (rho=0.42, p=0.036)  
 (%)  
 S2 (rho=0.32, p=0.12)  
 S3 S1 S2  
 67.24 ± 19.03 cm<sup>2</sup>, 가  
 32.55 ± 11.91 cm<sup>2</sup>  
 280.48 ± 74.43 mm<sup>2</sup>/kg/m<sup>2</sup> 137.06 ± 41.76 mm<sup>2</sup>/  
 kg/m<sup>2</sup> (Table 1).  
 0.2 - 0.4 mm  
 0.25 mm  
 (Figs. 3, 4). S1, S2, S3  
 (7).  
 (p<0.0001)  
 (p<  
 0.0001). 가

**Table 1.** Amount of Mediastinal and Extrapleural of Fat and Fat Amount Corrected by Body Mass Index

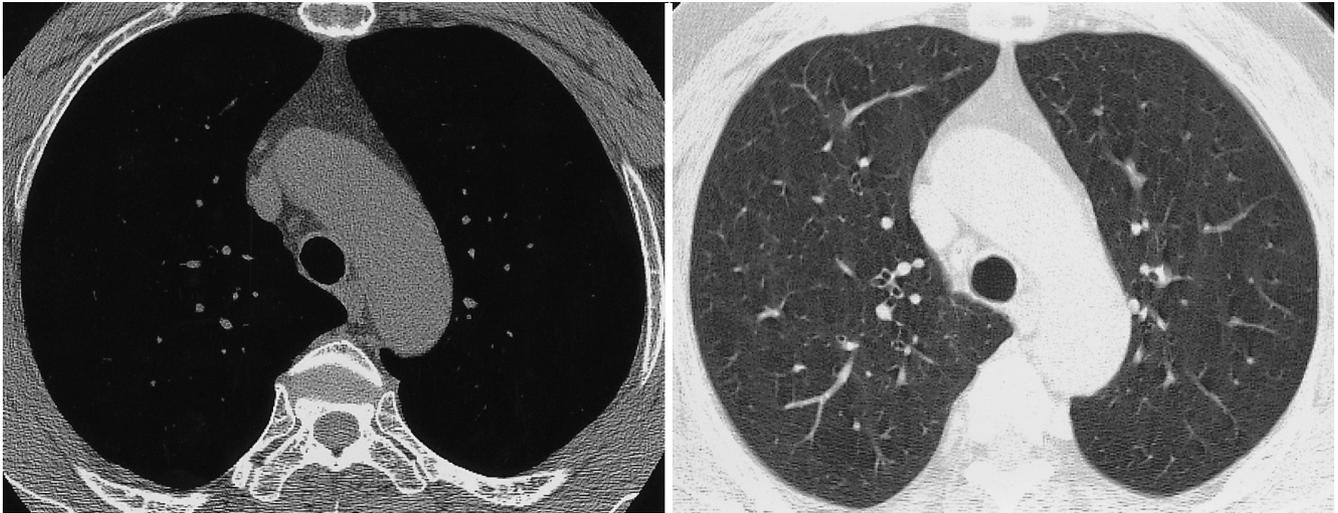
	Amount of Mediastinal and Extrapleural of Fat (cm <sup>2</sup> )		Fat Amount Corrected by Body Mass Index (mm <sup>2</sup> / kg/ m <sup>2</sup> )	
	IPF	Normal individuals	IPF	Normal individuals
S1	17.92 ± 6.77*	8.26 ± 3.81*	73.75 ± 23.07*	34.73 ± 14.40*
S2	22.18 ± 6.67*	11.12 ± 4.97*	92.51 ± 26.27*	46.65 ± 17.88*
S3	27.14 ± 7.48*	13.17 ± 3.92*	114.22 ± 35.08*	55.67 ± 13.47*
Total	67.24 ± 19.03*	32.55 ± 11.91*	280.48 ± 74.43*	137.06 ± 41.76*

Note. - Data are means ± 1 SD, \* indicates a p value less than 0.0001

S1- the level of the aortic arch, S2- the level of right pulmonary artery, S3- the level of right inferior pulmonary vein



**Fig. 3.** The CT section of aortic arch in a 63-year-old male with idiopathic pulmonary fibrosis.  
**A.** In mediastinal window setting (window width 300, window level 20) image, anterior mediastinal fat is thickened. The border of mediastinal fat is anteriorly bulged.  
**B.** In lung window setting (window width 1500, window level - 700) image, honeycombing is noted in the peripheral areas of bilateral lung.



**Fig. 4.** The CT section of aortic arch in a normal 63-year-old male.  
**A.** In mediastinal window setting (window width 300, window level 20) image, the normal appearance of anterior mediastinal fat is seen.  
**B.** In lung window setting (window width 1500, window level - 700) image, normal lung parenchyma is shown.

가  
(8).  
(8 - 11). emphysema (paraseptal 가  
(1).  
가 가 가  
가 가 가  
가 가 가  
(12, 13).  
CT 가  
S3 가 가  
가 가  
CT 가  
(14 - 17).  
가 가

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## Mediastinal and Extrapleural Fat Hypertrophy in Idiopathic Pulmonary Fibrosis on High-resolution CT: Comparison with Normal Individuals<sup>1</sup>

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**Purpose:** We wished to compare the amount of mediastinal and extrapleural fat on high resolution CT for patients with idiopathic pulmonary fibrosis (IPF) with that of normal individuals, and we wished to evaluate the correlation between the amount of fat and the degree of pulmonary fibrosis.

**Materials and Methods:** We selected a group of 25 patients with radiologically and clinically diagnosed IPF and we also selected another group of 25 age and gender-matched patients having no abnormalities on pulmonary function testing as well as HRCT as controls from our radiologic database search (mean age: 59 years, M:F = 11:14). We measured the area of mediastinal and extrapleural fat at the levels of the aortic arch and at the origin of the right pulmonary artery and right inferior pulmonary vein on three sections of HRCT by using software (Rapidia; 3DMED, Seoul, Korea). The total amount of fat was calculated by summing up the areas of the mediastinal and extrapleural fat, which is corrected by the body mass index; we also evaluated statistical differences between the two groups. At same sections of CT, the ratio (%) of the honeycombing area to the total areas of the lung was calculated. We evaluated the relationship between the amount of extrapleural or mediastinal fat with the ratio (%) of the honeycombing area.

**Results:** The total amount of fat in patients with IPF and normal individuals were  $67.24 \pm 19.03 \text{ cm}^2$  and  $32.55 \pm 11.91 \text{ cm}^2$ , respectively. The fat amount corrected by body mass index was  $280.48 \pm 74.43 \text{ mm}^2/\text{kg/m}^2$  in the IPF patients and  $137.06 \pm 41.76 \text{ mm}^2/\text{kg/m}^2$  in normal individuals. The differences between two groups for the total amount of fat and fat amount, as corrected for by the body mass index, were statistically significant ( $p < 0.0001$ ). The ratio (%) of the honeycombing area and the total amount of fat showed a moderate correlation ( $\rho = 0.43, p = 0.032$ ).

**Conclusion:** Patients with IPF have a larger amount of mediastinal and extrapleural fat than normal individuals. The hypertrophy of mediastinal and extrapleural fat in IPF may be affected by the severity of the interstitial fibrosis of the lung.

**Index words :** Computed tomography (CT), high-resolution  
Lung, CT  
Lung, fibrosis  
Mediastinum  
Fat, CT

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