# Wegener's granulomatosis manifested by $^{67}$Ga-citrate scanning

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# $^{67}$Ga-citrate スキャンにて陽性像を呈した Wegener の肉芽腫

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我々は，両肺に腫瘤状陰影が出没し，$^{67}$Ga-citrate によるシンチグラムで著明な陽性像を呈し，更に巣状糸球体炎を伴つた一剖検例を経験したので報告する．

症例は44歳の男性で発熱及び腰痛を主訴に来院し，胸部X線写真で左肺尖部に比較的柔らかな腫瘤状陰影及び左胸水を認めた（図１，２）．化学療法を行ない，肺腫瘤状陰影は一時消腿した（図３）．しかし２年半後の胸部X線写真では両肺に多発性腫瘤状陰影が出現した（図４，５）．同時期に $^{67}$Ga-citrate シンチグラムを施行したところ，胸部X線写真に相当して陽性像を認めた（図６）．再び化学療法を施行したところ，今回も肺病変には効果があつた（図７）．しかし患者は全身状態が悪化し死亡した．剖検所見は i）両肺に granulomatous fibrosis の瘢痕（図８）ii）focal glomerulonephritis（図９）iii）necrotizing colitis（図10）等の所見があり，病理学的診断は Wegener's granulomatosis であつた．

**Abstract**

This paper reports an autopsy case with Wegener's granulomatosis complicated with severe focal glomerulonephritis. In this case large nodular densities appeared intermittently in the bilateral lung fields and showed positive scan by $^{67}$Ga-citrate.

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## Introduction

Since Wegener reported the syndrome of destructive rhinitis, pulmonary lesions and glomerulonephritis as Wegener's granulomatosis in 1936[12], there has been much work published in the literature on Wegener's granulomatosis[3)4)5)8)]. Carrington and Liebow reported thereafter the limited forms, only involving the lung without evidence of glomerulitis and rhinitis[1)]. It is reported herewith an autopsy case of Wegener's granulomatosis where intermittent appearance of nodular shadows demonstrated in the lungs, with positive uptakes by $^{67}$Ga-citrate scanning, and with severe focal glomerulonephritis.

## Case Report

A 44 year old male visited Tokyo University Branch Hospital with the chief complaints of fever and lumbago in February 1970. He had suffered from mild diabetes mellitus. Intravenous pyelogram was within normal limits, but urine culture showed multiple Gram positive rods. Chest radiogram revealed large nodular densities in the apex of the left lung and pleural effusion as shown Fig. 1 and 2. The patient was, therefore, suspected pulmonary carcinoma and was admitted to our hospital. Laboratory findings on admission, as shown in Table 1, indicated that the erythrocyte sedimentation rate was accelerated, multiple Gram positive rods were found by urine culture and the cytology of sputum was in class II to III. As illustrated in Fig. 1 and 2, an abnormal massive shadow having a rather sharply marginated contour but no notching nor calcification was found in the chest radiogram. Differential diagnosis of neoplasm and granuloma was clinically discussed between radiologists and surgeons, but the conclusion was not obtained on this case. Surgeons suspected the possibility of pulmonary carcinoma and we insisted that the chemotherapy is the first choice. Therefore, chemotherapy with 10 g of fluorouracil (5-FU), 4 g of Endoxan, 40 mg of Mitomycin C and 10 mg of Toyomycin (FAMT) was carried out.

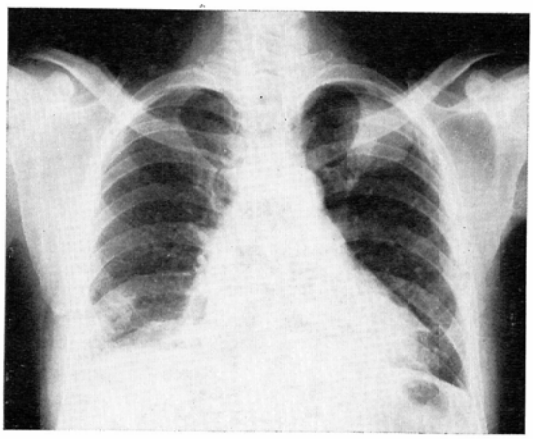

Fig. 1. Chest X-ray film in February 1970, 10 days after the admission showing the large nodular densities with 5cm in diameter in the apex of the left lung and slight pleural effusion.

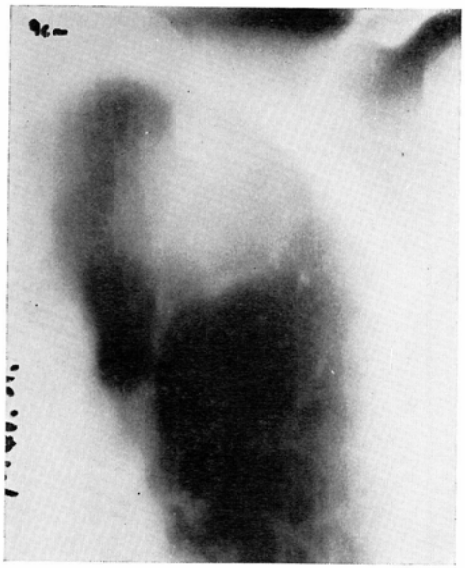

Fig. 2. Tomography at the same period as Fig. 1 (9cm).

Table 1

| | |
|---|---|
| 1970- 2 | NORMAL BLOOD CHEMISTRY |
| | ESR 98/1 h., 105/2 hrs. |
| | WBC 6700 |
| | URINAL CULTURE : G (+) ROD MULTIPLE |
| | Wa R (−), Tb (−) |
| | CYTOLOGY OF SPUTUM: CLASS II–III |
| 1972-10 | NORMAL BLOOD CHEMISTRY |
| | URINALYSES: Protein (+), Glucose (−) |
| | RBC 2–3/f, WBC 1–2/f. |
| | ESR 45/h., 76/2 hrs. |
| | WBC 9200 |
| | SPUTUM: Histiocytes, Monocytes |
| | CRP (++) |
| 1973- 1 | BLOOD CHEMISTRY: UN 80, GOT 204, GPT 186, |
| | LDH 750, Al-P 14. |
| | ESR 44/1 h., 87/2 hrs. |
| | WBC 13,900–26,200 |
| | URINALYSIS: Protein (++), Glucose (−), |
| | UROBILINOGEN (++) |
| | RBC multiple, WBC (−) |
| | CYTOLOGY OF ASCITES: CLASS II, Rivalta (−) |
| | RA (+), CRP (++), ASLO 80 |

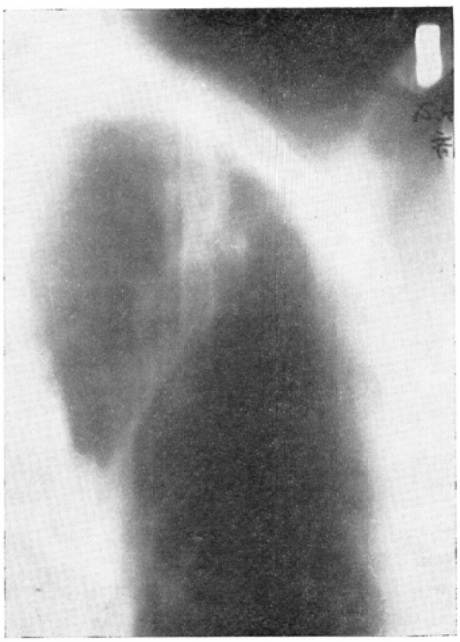

Fig. 3. Tomography following FAMT chemotherapy of about 2 months duration.

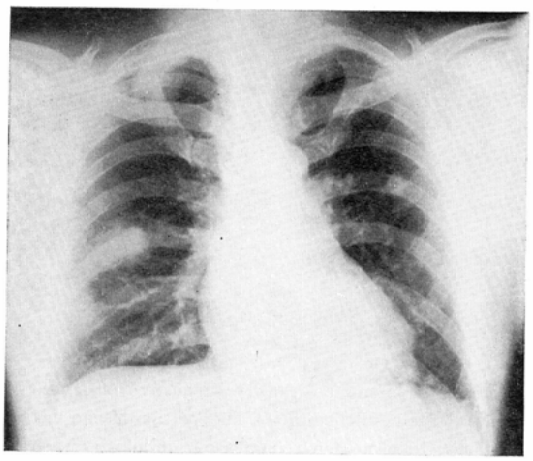

Fig. 4. Chest X-ray film in October 1972 showing nodular densities in the apex of the right lung and middle lung field. Mottling shadow and scar in the apex of the left lung are seen.

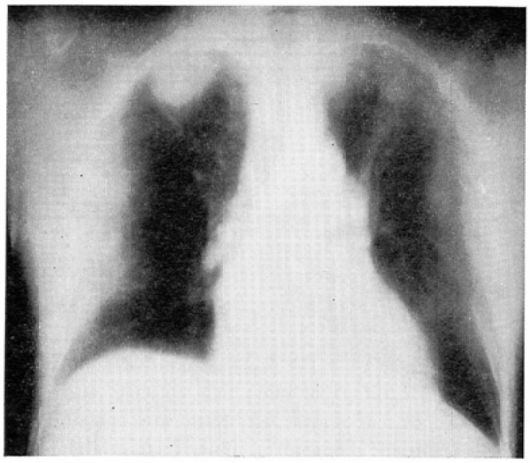

Fig. 5. Tomography at the same period as Fig. 4 (9cm distal to the back) showing shadow in the apex of right lung. Scar and mottling shadows in the apex of the left lung.

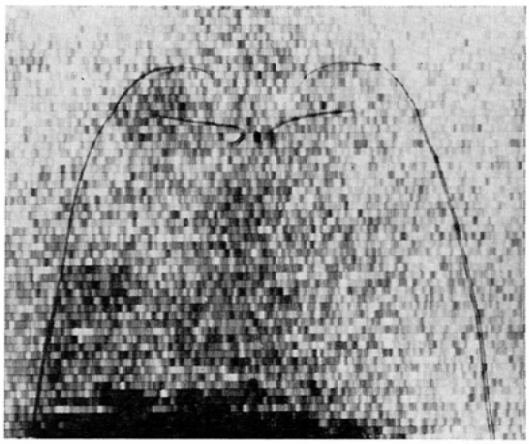

Fig. 6. Lung scanning was performed with the rectilinear scanner after the injection of 2mCi of $^{67}$Ga-citrate into the antecubital vein. Max counting rate was 100 counts per second, intensity 80, time constant 2 seconds, line spacing 4 mm and speed 60cm per minute.
Scintigram shows positive uptakes of radioisotope in the right apex and right middle lung.

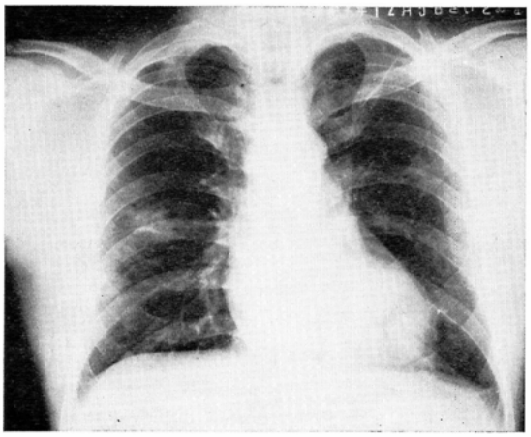

Fig. 7. Chest X-ray film following the 2nd FAMT chemotherapy showing only scars in the right apex, right middle lung and the left apex.

Following the above described treatment the pulmonary nodular densities were disappeared after about 2 months as shown in Fig. 3 and the patient was discharged.

In October 1972, the patient again complained of backache. Chest radiogram revealed multiple nodular shadows as shown in Fig. 4 and 5. $^{67}$Ga-citrate scanning revealed increased uptakes in the areas corresponding to the shadow as shown in Fig. 6. Laboratory findings at this stage is also indicated in

Fig. 8. Histology of the lung showing scarred granulomatous fibrosis with histiocytes containing hemosiderin pigment or lipid in the bilateral lungs by Elastical-Masson Goldner modification stain.

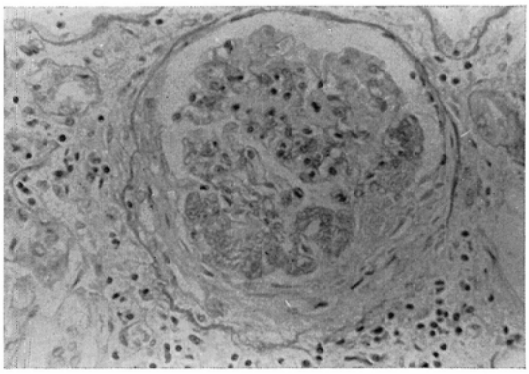

Fig. 9. Glomerular histology suggestive of severe focal glomerulonephritis. The portion of the tuft to the bottom shows increased cellularity with some breaking up of noclei, whereas the top of the glomerulus is spared.

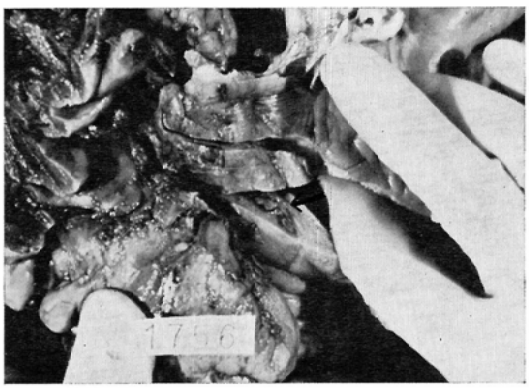

Fig. 10. Advanced necrotizing and phlegmonous colitis resulted probably from thrombosis of the inferior mesenteric vein. Arrow displays the thrombosis of the inferior mesenteric vein.

Table 1. FAMT therapy was then performed almost the same amounts as previously treated. It was also effective to the pulmonary lesions as shown in Fig. 7. However, the patient gradually became anorexia, and was readmitted in January 1973. Laboratory findings on admission were shown in Table 1. He showed the symptoms of stomatitis, conjunctivitis, blood stool with diarrhea, followed by ileus and then peritonitis. Ascites was repeatedly aspirated, he lost consciousness and died on January 24, 1973.

Autopsy findings were as follows: 1) several scars of granulomatous fibrosis with histiocytes containing hemosiderin pigment or lipid by Elastical-Masson Goldner modification stain in the bilateral lungs (Fig. 8) 2) several focal glomerulonephritis (Fig. 9) and 3) advanced necrotizing and phlegmonous colitis resulted probably from thrombosis of the inferior mesenteric vein (Fig. 10).

From above findings, the final pathological diagnosis was made to be Wegener's granulomatosis of the lung with focal glomerulonephritis.

## Discussion

In this case, the large nodular densities appeared intermittently in the both lung fields. $^{67}$Ga-citrate scanning revealed positive images in the same region. Cytology of sputum showed histiocytes. Leucocytosis and proteinuria was also observed (Table 1). Initially, differential diagnosis of pulmonary carcinoma, metastatic pulmonary carcinoma and granuloma was discussed from the above described clinical data and history. Thereafter, the postmortem examination revealed the scarred granulomatous lesions in the bilateral lungs and severe focal glomerulonephritis. Therefore, the final diagnosis was Wegener's granulomatosis.

As observed in this case, no clinical symptom in the upper respiratory tract was noted and therefore, a suspicion remained on the diagnosis of Wegener's granulomatosis. However, Sharnoff and Schneider reported a case of Wegener's granulomatosis of the lung with kidney involvement[10]. Furthermore, according to the recent report of Gonzalez and Van Ordstrand, the upper respiratory involvement was evidenced only in 6 out of 11 cases with Wegener's granulomatosis[6].

$^{67}$Ga-citrate was known to be uptaken not only in neoplastic disease[9], but also in sarcoidosis[2)7)], pulmonary abscess, osteomyelitis, chronic pneumonia, pulmonary tuberculosis[2)], pulmonary silicosis[11)] and pneumoconiosis[13)]. Therefore it seemed possible that the pulmonary lesions of Wegener's granulomatosis would also show positive scan. The results supported this expectation.

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