Although it was thought that there were no new cases of pneumoconiosis and that it was a disease in the past, recently a new type of pneumoconiosis has emerged as a new problem afflicting welders (Fig. 24) and dental technicians. In regard to the chest x-ray images for these cases of pneumoconiosis, we present findings specific to dust that was inhaled, and in order for many specialists to become aware of the characteristics, we created two volumes. One compiles chest x-rays of the latest cases of pneumoconiosis according to the occupation and is called “Compilation of image based examinations of pneumoconiosis cases according to current occupations” 2 and the other provides a simple explanation to medical practitioners called “Compilation of image based examinations of current pneumoconiosis cases” 3. From Rosai hospitals from all over Japan, we collected chest x-rays of the latest pneumoconiosis cases based on occupation.

The number of cases of pneumoconiosis complicated with lung cancer is increasing and in order to diagnose accurately the shadow of newly emerging lung cancer in pneumoconiosis cases with complicated chest x-rays, we established the temporal subtraction technique so that we can accurately and quickly diagnose pneumoconiosis complicated with lung cancer 1, 4, 5, 6.

We also successfully established the 3D CT method to obtain 3D images 1, 4, 7, 8 of pleural plaque and a differential diagnosis method for coniotic nodules and lung cancer based on PET 1, 5, 10.

**Temporal Subtraction Technique**

Finding the new shadowed area that emerges between the 2 chest x-ray images of pneumoconiosis in Fig. 25 is quite difficult, but as shown in Fig. 26, by utilizing computers to generate a subtraction image from the two chest x-rays, we can render the new shadow generated by the two images. By employing these types of methods, detecting new shadowed areas in cases of pneumoconiosis becomes easier.

**Pleural plaque images based on 3D CT method**

As shown in the horizontally sliced simple CT image

![Fig. 24. Example of welder’s lung in a 55 year old electric welder with 38 years of experience.](image)

![Fig. 25. Chest X-rays of a 78 year old patient with a 34 year history as a coal miner](image)
Fig. 26. Image generated by subtracting 2 chest x-ray images. The shaded area of the pneumoconiosis was hidden by the shaded area of the lung cancer (red arrow).

Fig. 27. Image of pleural plaque and intercostal veins using 3D CT (left) Image taken using conventional CT image (right)

Fig. 28. Pneumoconiosis complicated by lung cancer indicated by dark areas based on FDG-PET imaging

References:

* Reference 1 can be viewed at http://www.research12.jp/h13/index.html, a site dedicated to the research and development, and dissemination projects related to the 13 fields of occupational injuries and illnesses.
* References 3, 5, 8, and 9 can be viewed at http://www.research12.jp/h13/index.html, a site dedicated to the research and development, and dissemination projects related to the 13 fields of occupational injuries and illnesses.