PLAINTIFF'S EXHIBIT
RMC-45

REYNOLDS ALUMINUM

DATE

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Asbestosis

Naturally occurring silicates. Resistance to physical + chemical destruction. Fibrous.

Forms: Chrysotile $3MgO \cdot 2SiO_2 \cdot 2H_2O$

serpentine fibers ← Crocidolite ($NaFe(SiO_3)$) $FeSiO_3 \cdot H_2O$ blue asbestos

amphiboles straight fibers: Amosite ($FeMgSiO_3$)

Anthophyllite ($(MgFe)_2Si_8O_{22}(OH)_2$) - Finlan

Tremolite ($Ca_2Mg_5Si_8O_{22}(OH)_2$)

1st case asbestosis 1907.

radiographic changes 1917

detailed description 1927

increased lung cancer 1947

mesothelioma 1960

Producers - Canada, South Africa, U.S.S.R., Vermont

Dup + surface mines

Crysotile - 70% commercially produced.

Million tons used U.S. per year. 3/4 for fireproofing + insulation. Cement, tiles, felts

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Frequency asbestosis - 2° length, pattern, degree of exposure, possibly on size + type fiber.

More cases being seen in general population no more asbestos bodies now compared to 1934. Found in 48% those examined

Average age death has increased from 41-1930, to 57-1965.

Clinical features

Initially - SOB on exertion + dry cough. Early develop after several years progressive pulmonary fibrosis. Progresses even when removed from asbestos → cor pulmonale + death within 15 yr. onset disease

Late stages - cough, sputum, loss weight, + respiratory infection

Other causes death - bronchogenic, S.A., pleural neoplasms

Eng. ex. clinical exam chest x-ray, pulmonary function.

Clinical exam - (1) repetitive end-inspiratory crackles in dependent portion lungs. Related to lung deflation.

C progression → tachypnea, cyanosis, clubbing. Chest wall movement restriction → cor pulmonale.

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Radiographic features - changes lung parenchyma + pleura.

Parenchymal - linear & irregular changes.

X-ray classification -

small rounded opacities - classified according to diameter

p - up to 1.5 mm.

q - 1.5 to 3 mm.

r - 3 to 10 mm.

12 point scale - 0 dust to maximum dust.

major categories 0, 1, 2, 3

4 categories - if 1 decided but 2 considered: 1/2

0/- "Random normal"

0/0 - normal

0/1 inconsidered

zones - upper, middle, lower - right & left lung

e.g. R.U.Z. (zone)

small irregular opacities - types of thickness & texture

s - fine, irregular, linear opacities

t - medium " " "

u - coarse " " "

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large opacities: category A 1-5 cm.

" B ≥ 5 cm, less 1/3 1 lung

" C ≥ 1/3 1 lung

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Radiographic change — c̄ increased disease, reduction in lung ~~capacity~~ volume → gas, honeycombing. Opacities more propose lower lung zone.

Pleura - thickening & calcification. Ca carbophenic angles + diaphragm. Other causes - Asbestosis, pneumothorax, pleurisy.

Other x-ray change - bronchial ca, pleural mesothelioma, transient benign pleural effusion.

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Pulmonary function: —

Progressive ↓ v.c. + total lung capacity
slightly raised R.V.
reduction in CO diffusing capacity

E advancement — ↑ minute ventilation
arterial hypoxemia
↓ lung compliance.
E crucial — hyperventilation
arterial desaturation.

all changes same to any cause pulmonary fibrosis

v.c. + CO diffusion best early tests

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Pathology

fibrosis + asbestos bodies + fibers + pleural plaques.

(#1) fibrosis — gray-white fibrosis. Most lower lobes - helps to differentiate from other fibrosis.
alveolitis 2° asbestos fibers

(#2) asbestos fibers & bodies
bodies - yellow-brown, 20-150 microns length, 2.5 microns wide. dubbed ends, beaded appearance. Dudop-wetting macrophage. Granules about fiber - ferritin. May be in sputum.

(#3) pleural plaque + Ca
parietal pleura → postulation + basal pleura.

Pathogenesis

(1) Inhalation
(2) toxicity fiber → macrophage engulfs.
∴ cause fibrosis - mechanical - irritation (not ≡ fiberglass)
chemical - dissolution asbestos ⇒
silicic acid + metallic ions (chrysotile more soluble, but less fibrogenic)
autoimmune theory - fibers ⇒
abnormal globulins.

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Prevention

(1) + asbestos exposure.
(2) respiratory mask pin.
(3) control cloths.
(4) substitute for asbestos
(5) no smoking

Detection

(1) Pre-employment exam.
(2) Exam q. 2 years; q. 1 yr. after 10 years
exam
pulmonary function & CO diffusion

Management

Remove from exposure - ? effective -

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Asbestosis & pulmonary ca.

13.2% asbestosis die lung ca. (now 60%)
seem related to length of exposure. Chrysotile less dangerous.

0 cases ē smoking.
squamous or adeno; few oat cell.

Mesothelioma - 1960 33 cases S. Africa - area asbestos mine. Latent period 40 yr.

50 Bz + pain

+ lateral effusion

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