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ATTACHMENT B

Ms. Mary Z. Natkin
Washington and Lee University
School of Law
Lexington, VA 24450-0303

Dear Ms. Natkin:

Last March, Spencer J. Cox, a student you were supervising in clinic, requested information about the relationship between the size of a PMF (progressive massive fibrosis) lesion seen on x-ray when compared with what is likely to be found at autopsy.

To understand the answer to his question, it helps to have some understanding of the way an x-ray is produced. In essence, a point source of x-rays some distance from the individual produces beams of radiation that go through the subject's body, striking a sheet of film on the other side of the subject. The beam spreads slightly as it goes through the body. Different tissues within the body absorb different amounts of the x-ray beam energy, producing the darker and lighter shadows that are seen on an x-ray film. PMF lesions absorb more energy than the surrounding tissue and are visible as light spots on the x-ray film. The dimensions of a lesion as seen on the film will be slightly greater than the dimensions of the lesion in the body. How much greater depends on a number of factors including the distance of the lesion from the film and the distance of the beam source from the individual. I have enclosed a diagram relevant to this point.

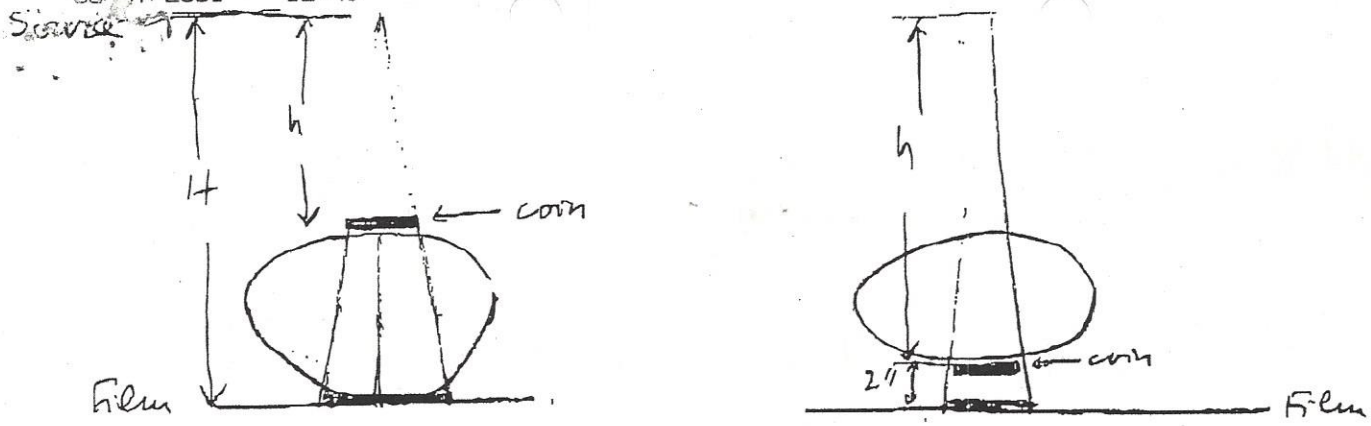
A lesion that is actually one centimeter in diameter, when that diameter is parallel to the plane of the x-ray film, will appear slightly larger than one centimeter in diameter on the film. This is analogous to the way that the shadow cast by an object held in front of a flashlight will be larger than the object itself. (It is possible for a lesion to be longer in one dimension than another; this would not necessarily be detected on the two-dimensional x-ray film. It is also possible for some lesions seen at autopsy to be inapparent on x-ray.)

I hope you find this information clarifies the issues raised in Mr. Cox's inquiry. Please write or call if you need additional information.

Sincerely yours,

Gregory R. Wagner, M.D.
Director
Division of Respiratory Disease Studies

Enclosure



$$\text{Magnification} = \frac{\text{size of the image}}{\text{size of the object}} = \frac{H}{h}$$

Example 1: $H = 72"$ $h = 72" - 8"$ coin diam = $1"$

$$\Rightarrow \quad \text{Magn} = \frac{72}{64} = 1.125$$

size of the image = $1" \times 1.125 = 1.125"$

Example 2: $H = 72"$ $h = 72" - 2" = 70"$

$$\text{Magn} = \frac{72}{70} = 1.029$$

Size of the image = $1" \times 1.029 = 1.029"$

Assumes coin is parallel to film