Image compression is becoming essential for applications such as teleradioly transmissions and storage within PACS databases. Two popular compression algorithms used today include JPEG and Wavelet transforms. Our study involves the detection of a feature in a clinical image and the effect of JPEG versus Wavelet compression on the detectablity of the feature. Using four trained psychophysical observers, we asked each observer to find an ulcerated lesion in a simulated artery segment placed into a x-ray angiographic clinical background. The observer then had to locate the ulcerated lesion within each image. There were 424 images in the study. Each reading involved 100 randomly choosen images from the 424. The percent correct was recorded for five separate readings on three different compression ratios: 7:1, 15:1 and 45:1, for each transform. The image size was $512 \times 512 \times 8$ bits in dimension. The simulated arteries were 20 pixels in diameter. The ulcerated lesion was 8 pixels in diameter. The overlap of the ulcerated lesion with the simulated artery was 4 pixels. Performing a pooled t-test (equal variance) on the correct percent responses, the results show that there is rejection of the null hypothesis that the means of the percent correct are equal between JPEG and Wavelet at both 7:1 (p = .0001) and 15:1 (p << .0001) but was not statistically significant at 45:1 (p = .35). JPEG had a higher percent correct average when compared to Wavelet at both 7:1 (71.3 vs 63.7) and 15:1 (63.6 vs 50.1).