

Lines/Patterns/Flaws in X-Ray Imaging Techniques

How to recognize and correct them



Imaging like you have never seen before!



To the veterinarian, the perfect image is one that offers adequate detail to see pathology when pathology exists and be able to produce the same level of image detail every day.

If you have worked with digital x-ray you have experienced the lines and patterns in the image. In CR, we can see several different kinds of flaws in the image and sometime several in the same image. The images enclosed should help you better recognize the various types of image flaws and their origins.

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Lines/Patterns/Flaws In X-Ray Imaging Techniques

Technique and
Image Quality Standards



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Banding - vertical lines usually 5-20cm thick that are lighter or darker than the rest of the image. With some CR scanners like AllPro ScanX, manufacturer supplied utility is available to digitally remove the "banding" lines from all subsequent images. With the ScanX, the utility is called "Normalize".



Plate feeding marks - horizontal lines 2-10cm thick caused by a plate feeding problem. If the plate sticks or jerks while feeding through the scanner, the image displays a different shade of grey in that exact image geometry. If the plate is viewed more slowly or more quickly by the scanner, the result is a change in the displayed grey scale. If this happens often, your scanner needs service.

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Uneven shade marks - if the plate is exposed to the light the image may show odd exposure marks like very light grey oval marks on the end of the plate. If you see odd exposure marks, are they in every image you produce or just occasionally? If not in every image, then it is likely erroneous light exposure to your CR plate.



The heel effect - the outer edges of the plate appear less exposed than the center - reminding us of the Inverse Square law, the outer edge of the plate is further away from the x-ray generator than the center. Also some x-ray generators will throw more energy to the right or left of center than its opposite. In most cases, this is not a big deal because the object of interest is mostly in the middle of the image.

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Collimation - though done on purpose, collimation can cause unexpected results. Imaging software can misinterpret the white space and inaccurately adjust to whole image causing diagnostic distortion.

This second collimation file shows what can happen to an image after cropping or masking an image that has a lot of collimation in the original.



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Thin white lines (not straight) - CR plates will wear out. One visible sign of CR plate wear can be the scratch marks that develop on the outside of the plate. The scratch marks can produce an exact duplicate "white" flaw mark in the digital image.



Thin white lines (straight) - hair and dust that gets caught in the optical scanner will cause white lines. This is very common and also easily resolved by using cleaning sheets on a regular basis.

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More Thin White Lines

– In this image, we have both simple hair lines and a wiggling line caused by a piece of hair that was moving as the plate passed through the scanner.



CR Plate Scratches –

this dental image contains scratch marks. The marks come from scratch marks on the surface of the plate. Some CR plates have delicate surfaces that can be easily scratched. Some CR plates can be repaired – which is cheaper than plate replacement.

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