a. b. c

Figure 7.16 Comparison of MUSICA and RCM modified images: a. Original image; b. MUSICA image; c. Linear wedge RCM

a. b. c

Figure 7.17 Comparison of MUSICA and RCM modified images (enlarged sections of Figure 7.16)

a. Original image; b. MUSICA image; c. Linear wedge RCM

7.6 Conclusions

In this section the development of digital RCMs for use with DR images was examined. Digital RCMs were designed to compensate for the effects of the wide dynamic range of the x-ray beam and patient-related subject contrast in DR images. High subject contrast results from two patient-related factors. These are either large differences of anatomical thickness that appear in the image or large differences of attenuation of the x-ray photons from different anatomical parts within the irradiated area. As discussed in Chapter 5, a typical means of overcoming high subject contrast within DR images is to reduce the displayed contrast within the image. Reducing the displayed contrast of the images allows the viewer to visualise all of the anatomy within the image at the same time. The disadvantage of this approach is that the contrast differences between anatomical areas within the image are reduced. This de-optimisation of displayed image contrast decreases the observer's ability to differentiate between regions within the image.

It has been shown that specifically applied digital RCMs enhance the displayed contrast in specific areas of the image, while leaving other areas unaffected. The overall effect is to reduce the dynamic range of the DR image while maintaining high subject contrast within the image. Observers are able to optimise the displayed contrast to the highest level while still being able to visualise all of the anatomy within the image. An expected side benefit is that viewers should need to perform less manipulation of contrast and density settings to fully visualise all of the anatomy at the highest displayed contrast.