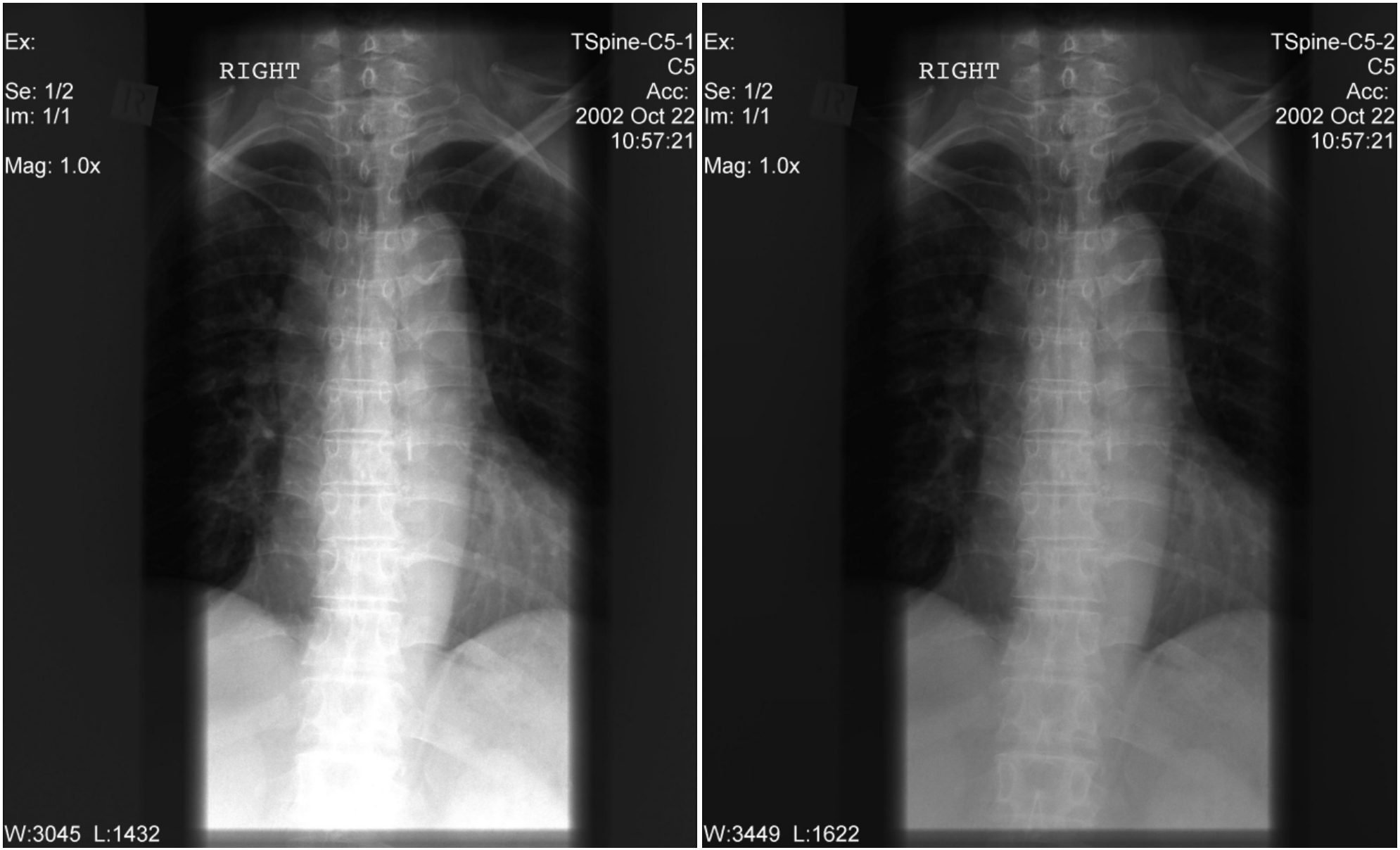


a. b.

Figure 7.3 Comparison of spine images: a. Original image; b. Linear wedge RCM applied

the brightness is altered to display in turn each of the top, middle and lower sections of the spine.

Digital radiographic examinations of the feet are also amenable to the application of a linear wedge RCM. Large anatomical thickness and attenuation differences exist between the toes and tarsal regions of the foot. The application of an appropriate RCM will assist in the compression of the large dynamic range and hence in the display of DR images of the feet.

Figures 7.4a & b provide a comparison of DR image of a foot (with a plaster back-slab support) and the same image with a linear wedge RCM applied. The original image of the foot, Figure 7.4a, has had the contrast and brightness altered to optimise the display of the tarsal and ankle regions of the image. Using this level of contrast and brightness, the toe and distal metatarsal regions appear black. The user selectable factors of the wedge RCM are shown in Table 7.4.

Table 7.4 User selectable factors of wedge RCM – foot (Figure 7.4b)

User selectable factors (Figure 7.4b)
curved or linear: linear
end vector lengths (%) non-enhanced: 0 enhanced: 10
rotation: 180º
profile height: 3.5

The contrast and brightness of the tarsal and ankle regions of the two images are similar. The use of the RCM has also allowed for optimisation of contrast and brightness in the toe and distal metatarsal regions without de-optimisation of the global contrast of the image. The effect of the application of the wedge RCM can also been seen in the black region external to the area of x-ray exposure.

a. b.

Figure 7.4 Comparison of foot images: a. Original image; b. Linear wedge RCM applied

Linear wedge RCMs were also applied to DR images of the abdomen, upper femur/hip and hands. Figures 7.5a & b provide a comparison of images of a right lateral decubitus abdomen, with and without RCM. A wedge RCM was applied to the original image with factors as shown in Table 7.5.

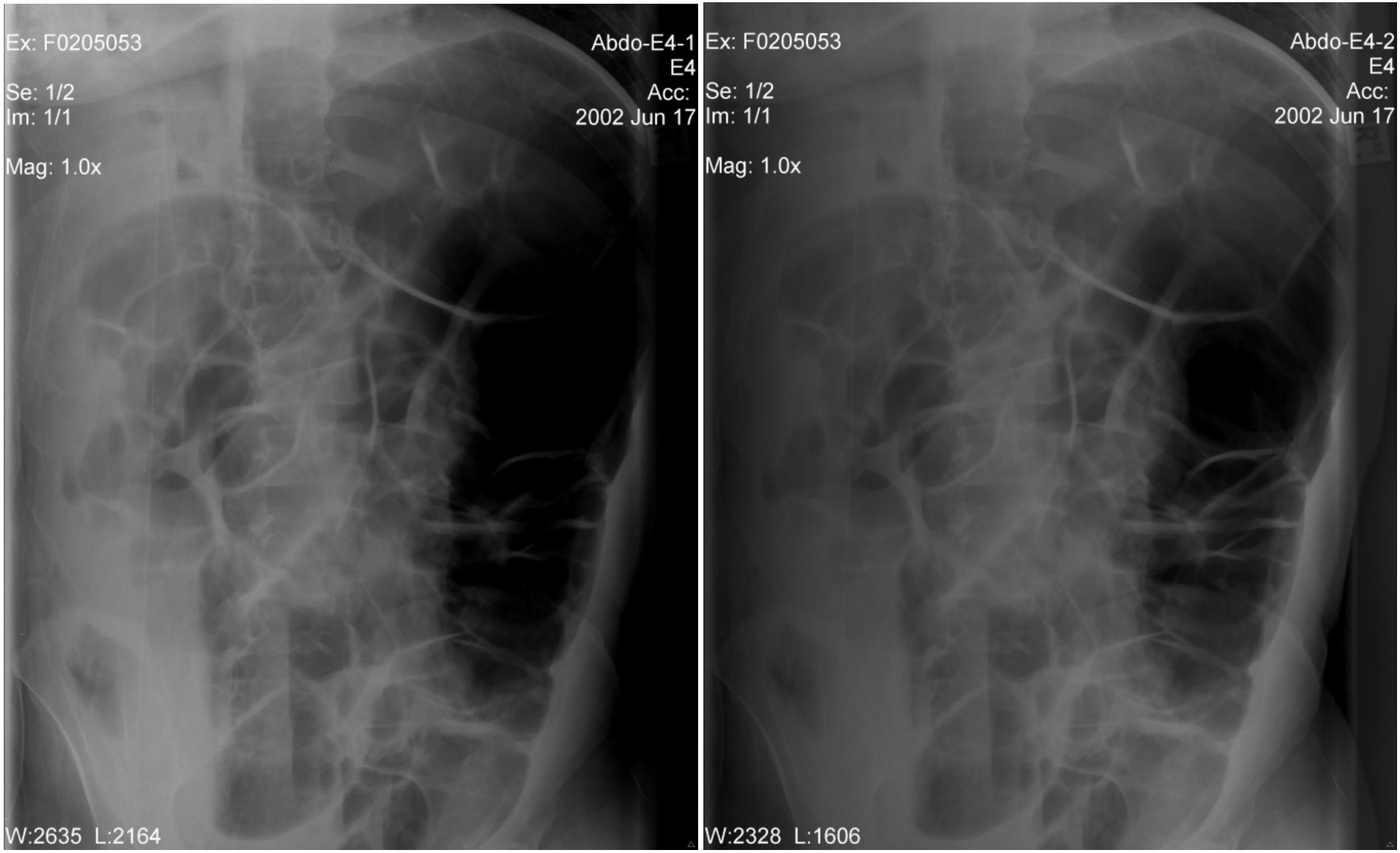
Table 7.5 User selectable factors of wedge RCM – abdomen (Figure 7.5b)

User selectable factors (Figure 7.5b)
curved or linear: linear
end vector lengths (%) non-enhanced: 0 enhanced: 0
rotation: 90º (counter-clockwise rotation of 90º)
profile height: 2.7

Visualisation through the bowel gas on the patient's left and of the anatomically denser regions on the patient's right is achieved in a single image. This is shown in the RCM image in Figure 7.5b.

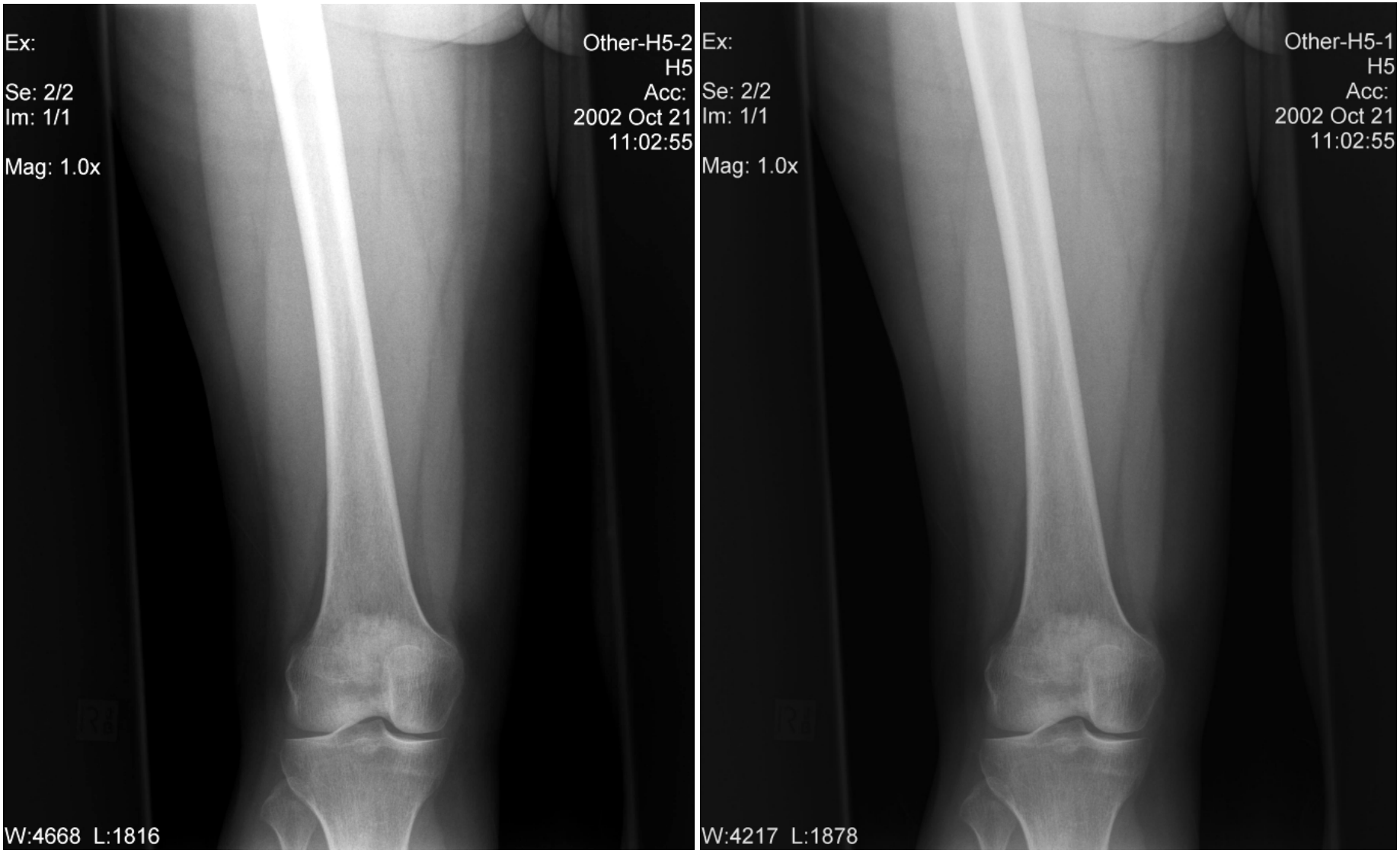
The differences between the two femur images, with and without the application of a wedge RCM, are more subtle in Figures 7.6a & b than in previous examples. A profile height of the linear wedge RCM of 2.2 was used in Figure 7.6b.

Image contrast differences can be seen between an original and the RCM modified image in Figures 7.7a & b. The original image of the hand, Figure 7.7a, has had the overall image contrast de-optimised to allow visualisation of the entire hand. A wedge RCM filter with factors as shown in Table 7.6 has been applied to original image and the result is shown in Figure 7.7b. High radiographic contrast has been achieved in the RCM image while still allowing visualisation of the entire hand.



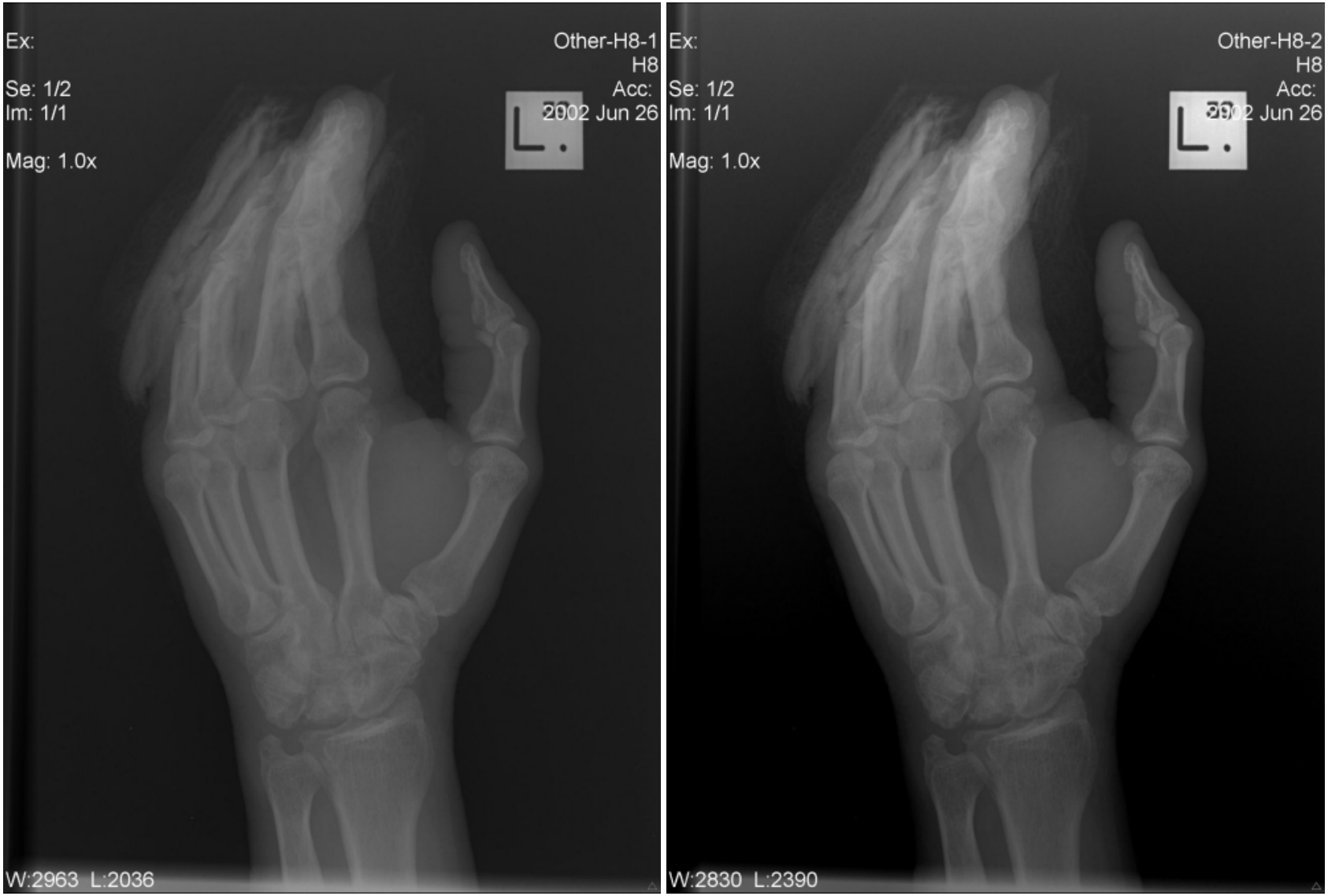
a. b.

Figure 7.5 Comparison of decubitus abdomen images: a. Original image; b. Linear wedge RCM applied



a. b.

Figure 7.6 Comparison of femur images: a. Original image; b. Linear wedge RCM applied



a. b.

Figure 7.7 Comparison of hand images: a. Original image; b. Linear wedge RCM applied

Table 7.6 User selectable factors of wedge RCM – hand (Figure 7.7b)

User selectable factors (Figure 7.7b)
curved or linear: linear
end vector lengths (%) non-enhanced: 0 enhanced: 0
rotation: 180º
profile height: 2.0

Curved wedge RCMs were also applied to DR images. A lateral DR examination of facial bones, seen in Figure 7.8a, was subsequently optimised for contrast across the entire image using a curved wedge RCM. The result is shown in Figure 7.8b. Factors used for the wedge RCM are shown in Table 7.7.

Table 7.7 User selectable factors of wedge RCM – face (Figure 7.8b)

User selectable factors (Figure 7.8b)
curved or linear: Gaussian curve, s = 2.5
end vector lengths (%) non-enhanced: 50 enhanced: 0
rotation: -110º (clockwise rotation of 110º)
profile height: 3.0

In this example, the RCM modified image shows higher overall radiographic contrast than the original image. The nasal bones are also better visualised in the RCM modified image.

An S-shaped curved RCM was applied to a lateral view of the lumbar spine in Figures 7.9a & b. The factors for the wedge RCM in Figure 7.9b are shown in Table 7.8.

Table 7.8 User selectable factors of wedge RCM – lumbar spine (Figure 7.9b)

User selectable factors (Figure 7.9b)
curved or linear: S-shaped curve, b = 1.0
end vector lengths (%) non-enhanced: 60 enhanced: 20
rotation: 180º
profile height: 2.2

Optimisation of the display of the lumbar spine, from thoracic to sacral regions is seen following the application of the RCM.