

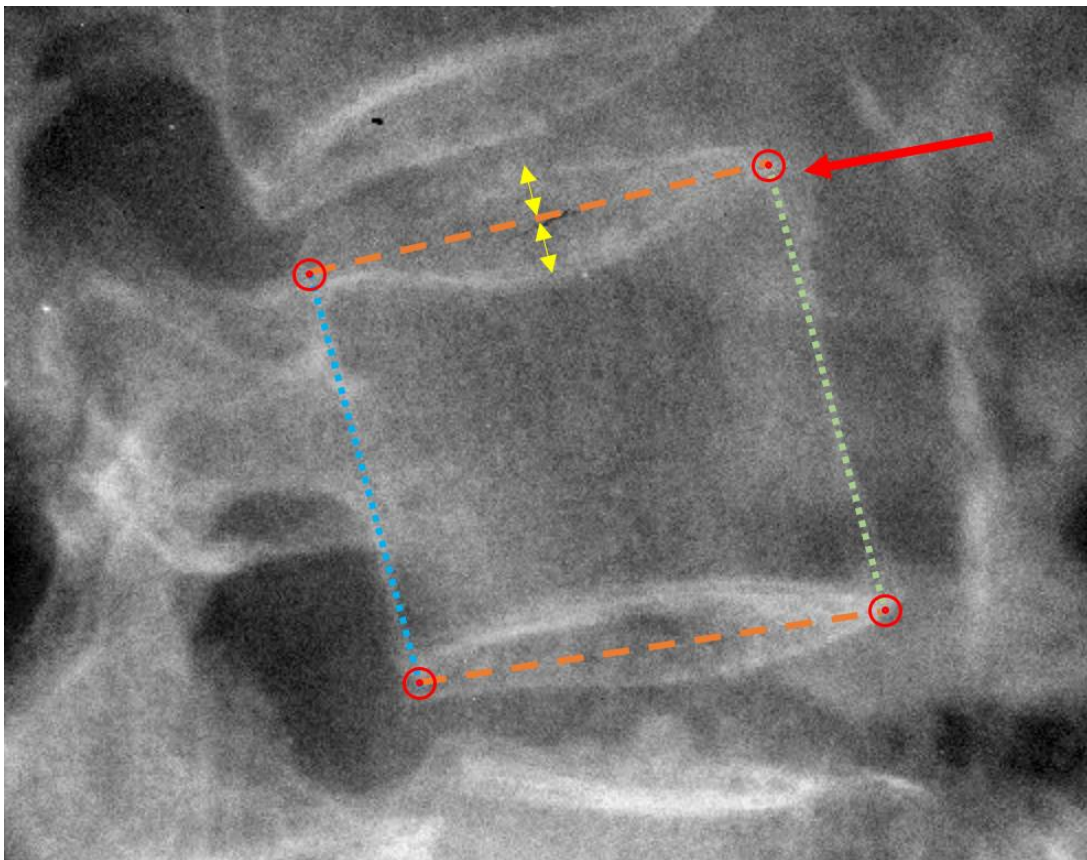
Supplementary File S1: Details of landmark placement

The standardized landmark placement was focused on the mid-sagittal plane of each vertebral body (Figure 1), excluding any residual uncinete processes, and placing landmarks that identify the corners of the vertebral bodies prior to any osteophyte formation ⁽¹⁻³⁾. The posterior superior landmarks are placed so as to represent the endplate as it would appear on a mid-sagittal slice of a CT exam, rather than up at the top of any posterior ridges on the upper endplate, similar to logic described in Keynan et al and Quint et al. ^(4,5).

When the X-ray beam path through a vertebra is not perpendicular to the mid-sagittal plane of the vertebra, the left and right rims of the vertebral endplates (as seen in Figure 1), and the left and right aspects of the posterior vertebral body may be seen on the X-ray.^(3,6) The mid-sagittal plane is assumed to be midway between the radiographic shadows of the left and right endplate rims, and midway between the radiographic shadows of the left and right aspects of the posterior wall. A similar approach was described by Quint et al.⁽⁵⁾ Multiple examples of landmark placement are provided online¹ since disc space metrics calculated from landmarks are dependent on the nuances of how landmarks are placed, and it is therefore important to appreciate landmark placement details.

¹ <https://www.dropbox.com/sh/qzrocrh86gpxarx/AAADRXs5HoEjVdRcGlwA4bela?dl=0>

Figure 1: Details of anatomic landmark placement. Dashed lines show the estimated mid-sagittal plane of the superior and inferior endplates, identified as bisecting the radiographic shadows of the left and right sides of the endplates (yellow arrows). The red circles show the four landmarks used to measure vertebral body morphology and disc space. The red arrow points to an anterior osteophyte that is ignored when placing landmarks. The dotted green and blue lines show the anterior and posterior aspects of the vertebral body.



References

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