Appendix 1: The bone mineral density (BMD) measurement

All BMD examinations were performed with a standard protocol according to the manufacturer's instructions. The main scan parameters were 120 kVp, smart mA (noise index: 10, 200–400 mA), scanning field of view of 50 cm, and reconstruction thickness and interval of 1.25 mm. All images were transferred to a dedicated quantitative computed tomography (QCT) post-processing workstation (Model 4 QCT pro v6.1; Mindways Software, Inc., Austin, USA) for BMD assessment. In addition, a QCT calibration phantom (Mindways Software Inc., USA) was scanned once a week for accurate asynchronous BMD analysis.

For BMD assessment, the BMDs of L1–2 vertebrae were measured, and the average values were calculated. An oval volume of interest (VOI) was manually placed with a depth of 9 mm, which avoids cortical bone, vertebral venous plexus, and bone islands, covering approximately 2/3 of cancellous bone. According to the clinical diagnostic criteria of BMD assessment, osteoporosis was defined as an average BMD of L1–L2 <80 mg/cm^3, osteopenia as a range of 80–120 mg/cm^3, and normal BMD as >120 mg/cm^3.