**Table S1.** MRI setting parameters

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sequence | T1-WI (sagittal) | T2-WI (sagittal) | T2-WI (sagittal)NO-MT | T2-WI (sagittal)MT | T2 mapping (sagittal) |
| Repetition (ms) | 571 | 2580 | 3000 | 3000 | 1500 |
| Echo time (ms) | 9.5 | 101 | 96 | 96 | 8.5 – 67.9 |
| Field of view (mm) | 24 × 24 | 24 × 24 | 26 × 26 | 26 × 26 | 20 × 20 |
| Matrix (mm × mm) | 320 × 240 | 320 × 240 | 320 × 240 | 320 × 240 | 256 × 160 |
| Slice thickness (mm) | 4 | 3 | 4 | 4 | 3 |
| Interslice gap (mm) | 0.4 | 0.3 | 0.4 | 0.4 | 0.6 |
| Number of slices | 7 | 10 | 8 | 8 | 64 |
| Echo trains/slice | 4 | 15 | 21 | 21 | - |
| Band width (KHz) | 240 | 283 | 284 | 284 | 31.25 |
| Offset (HZ) | \_ | \_ | \_ | 1100 | \_ |
| Number of signal-intensity acquisition | 2 | 2 | 2 | 2 | 1 |
| Examination time (s) | 120 | 172 | 138 | 138 | 247 |

ms: milliseconds; mm: millimeter; KHz: Kilo Hertz; s: second; T1-WI: T1-weighted imaging; T2-WI: T2-weighted imaging;

**Table S2.** Comparison of T2 relaxation time and MTR value at different age

|  |  |  |  |
| --- | --- | --- | --- |
| Age range | Number of discs | T2 relaxation time (ms) | MTR value (%) |
| 20 - 29 | 57 |  75.78 ± 13.44 **‡ ¶ # &** | 11.37 ± 4.35 **‡ ¶ # &** |
| 30 - 39 | 24 |  65.20 ± 8.52 **† ¶ # &** | 16.38 ± 2.20 **† # &** |
| 40 - 49 | 42 |  54.86 ± 8.35 **† ‡ &** | 18.65 ± 3.00 **† &** |
| 50 - 59 | 36 |  52.06 ± 8.35 **† ‡ &** | 20.47 ± 2.01 **† ‡ &** |
| ≥ 60 | 42 |  37.10 ± 10.70 **† ‡ ¶ #** | 25.98 ± 4.68 **† ‡ ¶ #** |

 MTR: magnetization transfer ratio; ms: millisecond; † P < 0.05 compared with discs of age range 20-29. ‡P < 0.05 compared with discs of age range 30-39; ¶P < 0.05 compared with discs of age range 40-49; #P < 0.05 compared with discs of age range 50-59; &P < 0.05 compared with discs of age ≥ 60.

**Table S3.** Comparison of T2 relaxation time and MTR value at different Pfirrmann grade

|  |  |  |
| --- | --- | --- |
| Pfirrmann grade | T2 relaxation time (ms) | MTR value (%) |
| I | 74.66 ±12.25 **‡ ¶ # &** | 13.93 ± 5.07 **‡ ¶ # &** |
| II | 63.99 ± 8.15 **† ¶ # &** | 17.65 ± 5.20 **† # &** |
| III | 49.88 ± 5.68 **† ‡ # &**  | 19.11 ± 4.15 **† &**  |
| IV | 36.43 ± 5.87 **† ‡ ¶ &** | 22.24 ± 5.17 **† ‡ &** |
| V | 25.37 ± 3.85 **† ‡ ¶ #** | 29.00 ± 4.09 **† ‡ ¶ #** |

MTR: magnetization transfer ratio; ms: millisecond. †P < 0.05 compared with discs of Pfirrmann grade I; ‡P < 0.05 compared with discs of Pfirrmann grade II; ¶P < 0.05 compared with discs of Pfirrmann grade III; #P < 0.05 compared with discs of Pfirrmann grade IV; &P < 0.05 compared with discs of Pfirrmann grade V.

**Table S4.** Receiver operating characteristic (ROC) curves to compare the diagnostic accuracy of T2 mapping and MTR for the discrimination between each two consecutive Pfirrmann grades

|  |  |  |  |
| --- | --- | --- | --- |
| Pfirrmann grade | T2 relaxation time |  | MTR value (%) |
| Cut-off value(ms) | AUC | Sensitivity% | Specificity% |  | Cut-off value | AUC | Sensitivity% | Specificity% |
| I *versus* II | 77.12 | 0.77 | 96.83 | 47.37 |  | 15.96 | 0.69 | 69.84 | 61.40 |
| II *versus* III | 54.60 | 0.92 | 85.37 | 90.48 |  | 12.17 | 0.58 | 97.57 | 17.46 |
| III *versus* IV | 45.45 | 0.97 | 100.00 | 80.49 |  | 17.24 | 0.67 | 88.46 | 41.46 |
| IV *versus* V | 31.70 | 0.94 | 100.00 | 80.77 |  | 23.78 | 0.84 | 100.00 | 65.38 |

MTR: magnetization transfer ratio; AUC: area under curve; ms: millisecond.