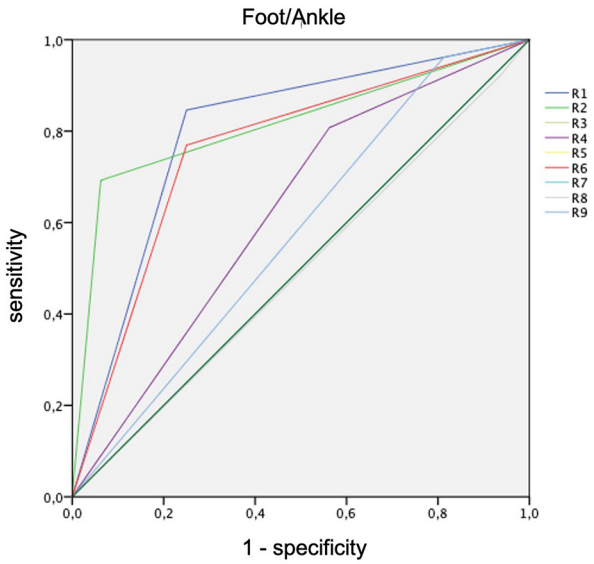
Supplementary

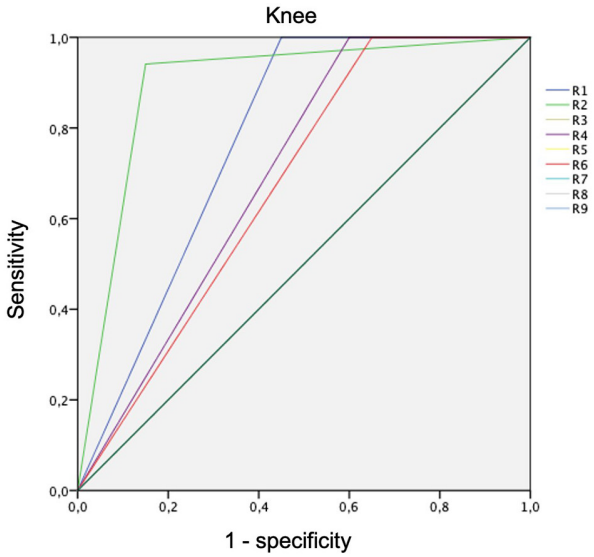


Setting	AUC	p	95%CI
R1	0.78	0.001	(0.65 ; 0.95)
R2	0.81	0.001	(0.68 ; 0.94)
R3	0.50	1.00	(0.32 ; 0.69)
R4	0.62	0.18	(0.44 ; 0.80)
R5	0.50	1.00	(0.32 ; 0.69)
R6	0.76	0.005	(0.60 ; 0.92)
R7	0.50	1.00	(0.32 ; 0.69)
R8	0.49	0.93	(0.31 ; 0.67)
R9	0.57	0.42	(0.39 ; 0.76)

AUC: area under the curve; 95%CI: 95% confidence interval
Significance: P<0.05

Figure S1 Comparative analysis of diagnostic performance from R1 to R9 settings for foot/ankle [ROC and area under the curve (AUC)].

https://dx.doi.org/10.21037/qims-21-321

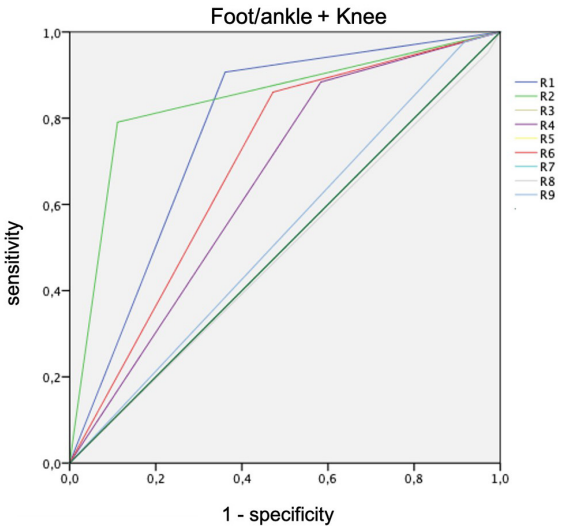


Setting	AUC	p	95%CI
R1	0.77	0.004	(0.62 ; 0.93)
R2	0.89	< 0.001	(0.78 ; 1.00)
R3	0.50	1.00	(0.31 ; 0.69)
R4	0.70	0.03	(0.53 ; 0.87)
R5	0.50	1.00	(0.31 ; 0.69)
R6	0.67	0.07	(0.50 ; 0.85)
R7	0.50	1.00	(0.31 ; 0.69)
R8	0.50	1.00	(0.31 ; 0.69)
R9	0.50	1.00	(0.31 ; 0.69)

AUC: area under the curve; 95%CI: 95% confidence interval
Significance: P<0.05

Figure S2 Comparative analysis of diagnostic performance from R1 to R9 settings for knee [ROC and area under the curve (AUC)].

https://dx.doi.org/10.21037/qims-21-321



Setting	AUC	p	95%CI
R1	0.77	< 0.001	(0.66 ; 0.88)
R2	0.84	< 0.001	(0.75 ; 0.93)
R3	0.50	1.00	(0.37 ; 0.62)
R4	0.65	0.02	(0.52 ; 0.77)
R5	0.50	1.00	(0.37 ; 0.62)
R6	0.69	0.003	(0.57 ; 0.81)
R7	0.50	1.00	(0.37 ; 0.62)
R8	0.49	0.88	(0.36 ; 0.61)
R9	0.53	0.64	(0.40 ; 0.66)

AUC: area under the curve; 95%CI: 95% confidence interval
Significance: P<0.05

Figure S3 Comparative analysis of diagnostic performance from R1 to R9 settings for foot/ankle + knee [ROC and area under the curve (AUC)].

https://dx.doi.org/10.21037/qims-21-321

Table S1 Comparison of the frequency of different ankle and/or foot artifacts according to the R1 to R9 settings (n=42)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	P
Nail bed n (%)	30 (71.4)	24 (57.1)	31 (73.8)	23 (54.7)	28 (66.6)	21 (50.0)	29 (69.0)	28 (66.6)	26 (61.9)	<0.001
Skin n (%)	6 (14.3)	1 (2.4)	11 (26.2)	3 (7.1)	7 (16.6)	2 (4.7)	7 (16.6)	4 (9.5)	2 (4.7)	<0.001
Beam hardening n (%)	14 (33.3)	2 (4.8)	17 (40.5)	6 (14.2)	13 (30.9)	5 (11.9)	42 (100)	38 (90.4)	34 (80.9)	<0.001
Clumpy n (%)	17 (40.5)	1 (2.4)	39 (92.9)	10 (23.8)	37 (88.1)	1 (2.3)	40 (95.2)	6 (14.2)	1 (2.3)	<0.001
Average volume of MSU Cm^3 (SD)	0.33 (0.50)	0.13 (0.25)	0.94 (0.95)	0.26 (0.40)	1.18 (1.08)	0.20 (0.36)	2.57 (1.93)	1.00 (1.17)	0.67 (0.92)	<0.001

SD, standard deviation. Significance: P<0.05.

Table S2 Correlation between most common artifacts and clinical features for the foot/ankle

		Age	Sex	HBP	Diabetes	BMI
Nails	Spearman σ	0.16	0.08	0.18	0.22	–0.03
	95% CI	[–0.16, 0.47]	[–0.24, 0.39]	[–0.13, 0.48]	[–0.07, 0.41]	[–0.31, 0.27]
	P	0.31	0.60	0.25	0.17	0.84
Skin	Spearman σ	–0.12	–0.05	0.02	–0.05	0.10
	95% CI	[–0.40, 0.19]	[–0.42, 0.25]	[–0.28, 0.32]	[–0.28, 0.31]	[–0.27, 0.44]
	P	0.44	0.73	0.89	0.72	0.52
Beam hardening	Spearman σ	0.20	–0.17	–0.02	0.14	–0.01
	95% CI	[–0.12, 0.41]	[–0.57, 0.15]	[–0.33, 0.29]	[–0.18, 0.45]	[–0.32, 0.29]
	P	0.21	0.29	0.90	0.40	0.95
Clumpy	Spearman σ	–0.18	0.24	–0.013	–0.04	0.20
	95%CI	[–0.47, 0.13]	[–0.05, 0.45]	[–0.32, 0.29]	[–0.34, 0.28]	[–0.13, 0.51]
	P	0.26	0.12	0.93	0.77	0.21

HBP, high blood pressure; BMI, body mass index; 95% CI: 95% confidence interval. Significance: P<0.05.

https://dx.doi.org/10.21037/qims-21-321

Table S3 Comparison of the frequency of different knee artifacts according to the R1 to R9 settings (n=38)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	P
Meniscal beam hardening n (%)	21 (55.3)	6 (15.8)	29 (76.3)	16 (42.1)	30 (78.9)	15 (39.5)	33 (86.8)	20/ (52.6)	19 (50)	<0.001
Beam hardening n (%)	25 (65.8)	10 (26.3)	25 (65.8)	15 (39.5)	27 (71.1)	17 (44.7)	38 (100)	38 (100)	38 (100)	<0.001
Clumpy n (%)	9 (23.7)	1 (2.6)	36 (94.7)	4 (10.5)	38 (100)	3 (7.9)	38	6 (15.8)	0 (0)	<0.001
Vascular n (%)	7 (18.4)	0 (0)	8 (21.1)	2 (5.3)	7 (18.4)	3 (7.9)	14 (36.8)	9 (23.7)	9 (23.7)	<0.001
Average volume of MSU, cm^3 (SD)	0.42 (0.64)	0.17 (0.35)	0.82 (0.97)	0.28 (0.54)	1.12 (1.17)	0.24 (0.42)	3.21 (2.16)	1.64 (1.31)	1.17 (0.95)	<0.001

Table S4 Correlation between most common artifacts and clinical features for the knee

		Age	Sex	HBP	Diabetes	BMI	Severe osteoarthritis	CPP
Beam hardening	Spearman σ	0.12	0.07	0.27	0.05	0.43	0.25	–0.025
	95% CI	[–0.20, 0.41]	[–0.26, 0.41]	[–0.05, 0.58]	[–0.28, 0.36]	[0.09, 0.66]	[–0.06, 0.54]	[–0.56, 0.12]
	P	0.40	0.66	0.10	0.75	0.007	0.14	0.12
Meniscal beam hardening	Spearman σ	0.138	–0.057	0.126	–0.021	–0.04	0.185	0.50
	95% CI	[–0.20, 0.45]	[–0.38, 0.27]	[–0.18, 0.42]	[–0.32, 0.29]	[–0.36, 0.27]	[–0.12, 0.51]	[0.31, 0.66]
	P	0.40	0.73	0.45	0.90	0.77	0.26	0.001
Clumpy (or submillimiter artifact)	Spearman σ	0.13	0.19	–0.05	0.25	0.14	0.05	–0.16
	95% CI	[–0.14, 0.41]	[–0.09, 0.40]	[–0.41, 0.27]	[–0.11, 0.56]	[–0.16, 0.42]	[–0.28, 0.41]	[–0.37, 0.15]
	P	0.53	0.41	0.75	0.13	0.39	0.73	0.32
Vascular	Spearman σ	0.16	0.13	0.004	–0.20	–0.06	0.17	–0.10
	95% CI	[–0.11, 0.42]	[–0.16, 0.35]	[–0.36, 0.28]	[–0.40, 0.11]	[–0.33, 0.23]	[–0.17, 0.47]	[–0.33, 0.21]
	P	0.34	0.43	0.98	0.23	0.71	0.30	0.53

HBP, high blood pressure; BMI, body mass index; CPP, Calcium Pyrophosphate deposits; 95% CI: 95% confidence interval. Significance: P<0.05.

https://dx.doi.org/10.21037/qims-21-321

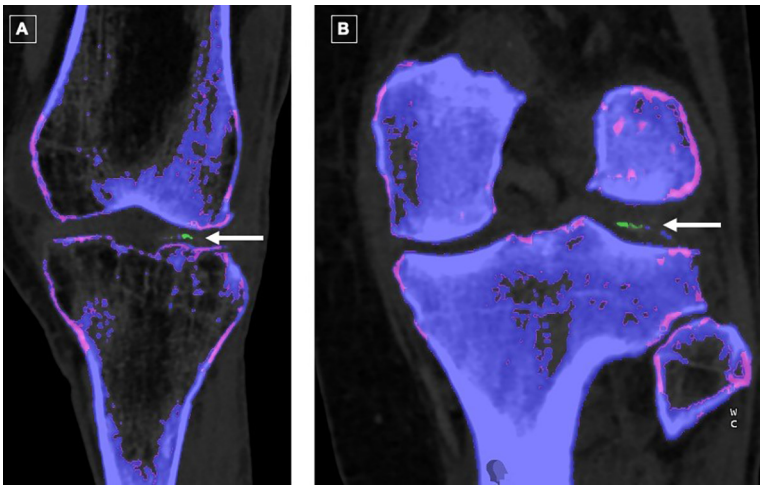


Illustration of meniscal beam hardening artifact in knee (image A and B) (arrows).

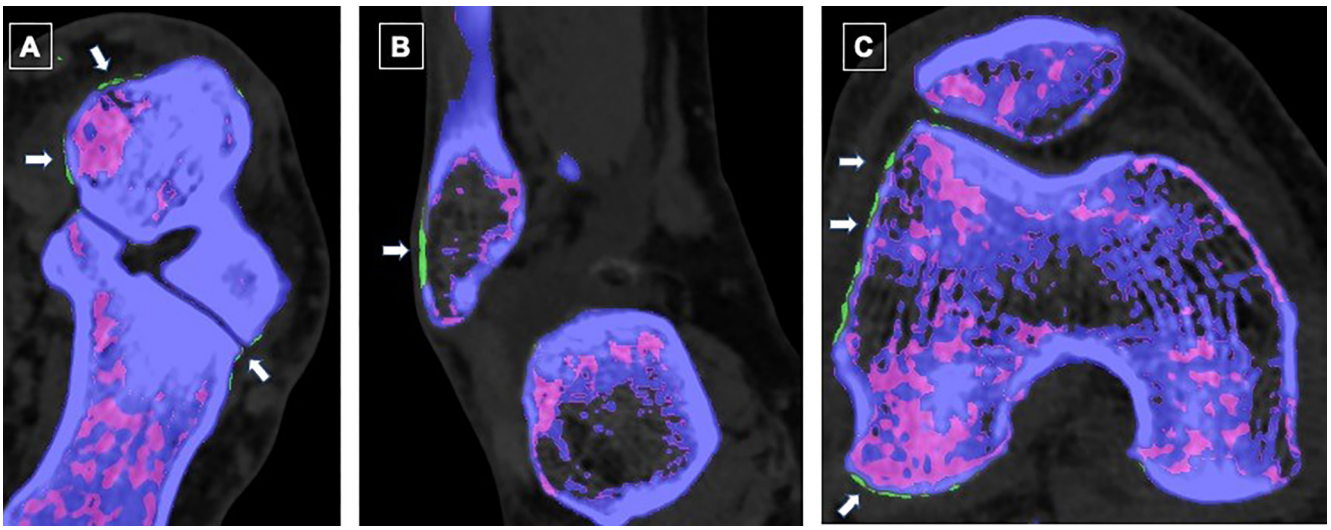


Illustration of beam hardening artifact in ankle (A, B) and knee (C) (arrows). Beam hardening follows the path of the hardened beam and was seen mainly within cortical bone. The beam hardening artifact was defined by a linear green deposit following cortical bone.

https://dx.doi.org/10.21037/qims-21-321