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Appendix 1
Images for assessment

As part of the consultation routine, posteroanterior spine radiographs using the EOS® imaging system (EOS Imaging, Paris, France) with low-dose radiation were performed, specifically adjusted to the radiation dose for paediatric and adolescent patients as per manufacturer instructions. There was standardized protocol on patient's positioning (hands, limbs and feet) inside the scanning cabin, with the spine positioned at the centre of the image. As compared to the conventional radiograph which has significantly more distortion of the pelvis due to magnification effects, the EOS imaging technique was found reliable for gross pelvic and acetabular morphology.[33] This allows the radiographic representation of the anatomical features to be assessed accurately. Image quality of the digital radiographs was adjusted for gray scale, brightness and contrast as necessary.

(Bittersohl B, Freitas J, Zaps D, Schmitz MR, Bomar JD, Muhamad AR, et al. EOS Imaging of the Human Pelvis: Reliability, Validity, and Controlled Comparison with Radiography. JBJS. 2013;95(9):e58.)

Appendix 2. Growth rates per skeletal maturity grading

Skeletal maturity measures	Girls				Boys			
	N	Growth rate based on BH	Growth rate based on AS	Growth rate based on SH	N	Growth rate based on BH	Growth rate based on AS	Growth rate based on SH
Proximal Femur Maturity Index								
Grade 0	0				2	0.31 ± 0.16	0.14 ± 0.21	0.08 ± 0.11
Grade 1	10	0.61 ± 0.35	0.50 ± 0.34	0.33 ± 0.26	16	0.77 ± 0.50	0.61 ± 0.31	0.25 ± 0.30
Grade 2	22	0.66 ± 0.35	0.60 ± 0.40	0.34 ± 0.18	14	0.94 ± 0.50	0.97 ± 0.71	0.38 ± 0.42
Grade 3	56	0.79 ± 0.44	0.70 ± 0.46	0.42 ± 0.23	10	1.06 ± 0.67	0.93 ± 0.50	0.53 ± 0.43
Grade 4	42	0.61 ± 0.43	0.48 ± 0.42	0.37 ± 0.27	14	0.41 ± 0.28	0.58 ± 0.28	0.43 ± 0.19
Grade 5	16	0.24 ± 0.25	0.20 ± 0.22	0.20 ± 0.22	5	0.17 ± 0.21	0.18 ± 0.24	0.18 ± 0.15
Grade 6	11	0.12 ± 0.23	0.06 ± 0.12	0.09 ± 0.10	2	0.00 ± 0.00	0.06 ± 0.08	0.00 ± 0.00
Risser staging								
0 -	63	0.74 ± 0.44	0.70 ± 0.46	0.38 ± 0.24	39	0.81 ± 0.47	0.76 ± 0.55	0.32 ± 0.33
0 +	50	0.74 ± 0.41	0.55 ± 0.43	0.41 ± 0.22	8	0.97 ± 0.81	0.77 ± 0.45	0.60 ± 0.46
1	3	0.44 ± 0.38	0.37 ± 0.34	0.18 ± 0.27	0			
2	16	0.36 ± 0.22	0.29 ± 0.28	0.30 ± 0.25	2	0.74 ± 0.40	0.57 ± 0.16	0.65 ± 0.05
3	16	0.28 ± 0.28	0.29 ± 0.26	0.19 ± 0.21	8	0.29 ± 0.21	0.48 ± 0.39	0.32 ± 0.18
4	6	0.00 ± 0.00	0.02 ± 0.04	0.13 ± 0.18	6	0.09 ± 0.18	0.21 ± 0.25	0.12 ± 0.14
5	3	0.04 ± 0.07	0.00 ± 0.00	0.00 ± 0.00	0			
Sanders staging								
SS1	9	0.70 ± 0.60	0.75 ± 0.40	0.41 ± 0.22	12	0.62 ± 0.26	0.68 ± 0.76	0.24 ± 0.31
SS2	53	0.78 ± 0.41	0.64 ± 0.47	0.41 ± 0.26	28	0.83 ± 0.52	0.76 ± 0.44	0.36 ± 0.34
SS3	48	0.72 ± 0.39	0.60 ± 0.45	0.40 ± 0.21	8	1.21 ± 0.66	0.83 ± 0.39	0.62 ± 0.44
SS4	12	0.41 ± 0.20	0.47 ± 0.37	0.41 ± 0.20	7	0.36 ± 0.14	0.63 ± 0.37	0.39 ± 0.14
SS5	13	0.41 ± 0.39	0.33 ± 0.21	0.12 ± 0.16	1	0.00	0.00	0.00
SS6	4	0.24 ± 0.20	0.21 ± 0.30	0.20 ± 0.32	1	0.00	0.46	0.14
SS7	9	0.19 ± 0.25	0.15 ± 0.12	0.20 ± 0.09	4	0.10 ± 0.20	0.15 ± 0.24	0.11 ± 0.16
SS8	9	0.05 ± 0.07	0.01 ± 0.03	0.06 ± 0.10	1	0.00	0.16	0.33

DRU Classification							
Radius grading							
R4	1	0.39	0.65	0.39	0		
R5	13	0.60 ± 0.26	0.65 ± 0.35	0.35 ± 0.19	20	0.73 ± 0.47	0.74 ± 0.63	0.24 ± 0.32
R6	54	0.77 ± 0.46	0.72 ± 0.50	0.41 ± 0.28	16	0.84 ± 0.50	0.75 ± 0.50	0.37 ± 0.35
R7	41	0.72 ± 0.38	0.48 ± 0.40	0.40 ± 0.17	15	0.89 ± 0.61	0.72 ± 0.40	0.56 ± 0.35
R8	30	0.47 ± 0.41	0.40 ± 0.32	0.27 ± 0.27	4	0.33 ± 0.17	0.77 ± 0.32	0.37 ± 0.12
R9	9	0.14 ± 0.15	0.16 ± 0.15	0.19 ± 0.09	6	0.09 ± 0.18	0.21 ± 0.25	0.12 ± 0.14
R10	8	0.05 ± 0.08	0.01 ± 0.03	0.04 ± 0.08	2	0.00 ± 0.00	0.08 ± 0.11	0.17 ± 0.23
R11	1	0.00	0.00	0.22	0		
Ulnar grading							
U1	1	0.39	0.65	0.39			
U2	1	0.39	0.48	0.35	1	0.42	0.29	0.15
U3	2	0.54 ± 0.06	0.33 ± 0.20	0.37 ± 0.35	11	0.77 ± 0.57	0.64 ± 0.56	0.24 ± 0.42
U4	31	0.58 ± 0.32	0.69 ± 0.48	0.34 ± 0.23	15	0.82 ± 0.45	0.70 ± 0.61	0.28 ± 0.25
U5	64	0.86 ± 0.44	0.65 ± 0.46	0.45 ± 0.24	18	0.96 ± 0.59	0.92 ± 0.45	0.50 ± 0.40
U6	27	0.56 ± 0.37	0.47 ± 0.32	0.32 ± 0.21	9	0.47 ± 0.24	0.64 ± 0.32	0.48 ± 0.18
U7	23	0.23 ± 0.23	0.19 ± 0.19	0.16 ± 0.17	7	0.10 ± 0.17	0.23 ± 0.24	0.13 ± 0.12
U8	6	0.05 ± 0.07	0.00 ± 0.00	0.06 ± 0.10	2	0.00 ± 0.00	0.08 ± 0.11	0.17 ± 0.23
U9	2	0.00 ± 0.00	0.05 ± 0.06	0.11 ± 0.16			
PHOS							
1	6	0.40 ± 0.29	0.44 ± 0.19	0.32 ± 0.22	5	0.67 ± 0.43	0.73 ± 0.28	0.10 ± 0.09
2	22	0.61 ± 0.35	0.64 ± 0.41	0.37 ± 0.27	15	0.58 ± 0.25	0.60 ± 0.46	0.19 ± 0.21
3	71	0.73 ± 0.40	0.63 ± 0.48	0.38 ± 0.22	23	0.83 ± 0.55	0.67 ± 0.43	0.46 ± 0.34
4	38	0.50 ± 0.45	0.30 ± 0.28	0.30 ± 0.24	8	0.20 ± 0.21	0.30 ± 0.26	0.20 ± 0.13
5	6	0.02 ± 0.05	0.00 ± 0.00	0.04 ± 0.09	0		

Note: N: number of patients

Appendix 3. Distribution of Risser stages, Sanders stages, DRU grades and PHOS stages per Proximal Femur Maturity Index grading

For girls

	PFMI gradings – frequency in numbers (column percentages)					
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Chronological age (years, mean ± SD)	10.3 ± 1.1	10.6 ± 0.8	11.3 ± 0.7	12.2 ± 0.8	13.3 ± 0.8	14.0 ± 0.8
Premenarchal	10 (100%)	21 (95.5%)	55 (98.2%)	26 (61.9%)	2 (12.5%)	0
Risser stage						
0-	10 (100%)	18 (81.8%)	33 (58.9%)	2 (4.8%)		
0+		4 (18.2%)	22 (39.3%)	24 (57.1%)		
1				2 (4.8%)	1 (6.3%)	
2			1 (1.8%)	9 (21.4%)	6 (37.5%)	
3				5 (11.9%)	7 (43.8%)	4 (36.4%)
4					1 (6.3%)	5 (45.5%)
5					1 (6.3%)	2 (18.2%)
Sanders staging						
SS1	4 (40%)	3 (13.6%)	2 (3.6%)			
SS2	4 (40%)	17 (77.3%)	27 (48.2%)	5 (11.9%)		
SS3	2 (20%)	2 (9.1%)	26 (46.4%)	16 (38.1%)	2 (12.5%)	
SS4			1 (1.8%)	10 (23.8%)	1 (6.3%)	
SS5				9 (21.4%)	4 (25%)	
SS6					4 (25%)	
SS7				2 (4.8%)	4 (25%)	3 (27.3%)
SS8					1 (6.3%)	8 (72.7%)
DRU Classification - Radius grading						
R4	1 (10%)					
R5	5 (50%)	8(36.4%)				
R6	4 (40%)	13 (59.1%)	34 (60.7%)	3 (7.1%)		

R7		1 (4.5%)	21 (37.5%)	18 (42.9%)	1 (6.3%)	
R8			1 (1.8%)	19 (45.2%)	9 (56.3%)	1 (9.1%)
R9				2 (4.8%)	5 (31.3%)	2 (18.2%)
R10					1(6.3%)	7 (63.6%)
R11						1 (9.1%)
DRU Classification - Ulnar grading						
U1	1 (10%)					
U2		1 (4.5%)				
U3	2 (20%)					
U4	7 (70%)	13 (59.1%)	11 (19.6%)			
U5		8 (36.4%)	39 (69.6%)	17 (40.5%)		
U6			6 (10.7%)	18 (42.9%)	3 (18.8%)	
U7				7 (16.7%)	13 (81.3%)	3 (27.3%)
U8						6 (54.5%)
U9						2 (18.2%)
PHOS						
1	3 (33.3%)	3 (13.6%)				
2	4 (44.4%)	7 (31.8%)	9 (17.3%)	2 (5.4%)		
3	2 (22.2%)	10 (45.5%)	37 (71.2%)	21 (56.8%)	1 (6.7%)	
4		2 (9.1%)	6 (11.5%)	14 (37.8%)	13 (86.7%)	3 (37.5%)
5					1 (6.7%)	5 (62.5%)

For boys

	PFMI gradings – frequency in numbers (column percentages)						
	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Chronological age (years, mean ± SD)	11.0 ± 0.7	11.4 ± 0.6	12.0 ± 0.8	12.7 ± 1.0	13.5 ± 0.8	15.0 ± 1.3	15.5 ± 0.5
Risser stage							

0-	2 (100%)	16 (100%)	14 (100%)	7 (70%)			
0+				3 (30%)	5 (35.7%)		
1							
2					2 (14.3%)		
3					6 (42.9%)	2 (40%)	
4					1 (7.1%)	3 (60%)	2 (100%)
5							
Sanders staging							
SS1	2 (100%)	7 (43.8%)	2 (14.3%)	1 (10%)			
SS2		9 (56.3%)	12 (85.7%)	4 (40%)	3 (21.4%)		
SS3				5 (50%)	3 (21.4%)		
SS4					6 (42.9%)	1 (20%)	
SS5						1 (20%)	
SS6					1 (7.1%)		
SS7						3 (60%)	1 (100%)
SS8					1 (7.1%)		
DRU Classification - Radius grading							
R4							
R5	2 (100%)	13 (81.3%)	5 (35.7%)				
R6		3 (18.8%)	8 (57.1%)	5 (50%)			
R7			1 (7.1%)	5 (50%)	8 (57.1%)	1 (20%)	
R8					4 (28.6%)		
R9					1 (7.1%)	4 (80%)	1 (50%)
R10					1 (7.1%)		1 (50%)
R11							
DRU Classification - Ulnar grading							
U1							

U2	1 (50%)						
U3	1 (50%)	8 (50%)	2 (14.3%)				
U4		7 (43.8%)	7 (50%)	1 (10%)			
U5		1 (6.3%)	5 (35.7%)	9 (90%)	3 (21.4%)		
U6					8 (57.1%)	1 (20%)	
U7					2 (14.3%)	4 (80%)	1 (50%)
U8					1 (7.1%)		1 (50%)
U9							
PHOS							
1	1 (50%)	4 (30.8%)					
2	1 (50%)	5 (38.5%)	7 (53.8%)	2 (33.3%)			
3		4 (30.8%)	6 (46.2%)	4 (66.7%)	9 (75%)		
4					3 (25%)	5 (100%)	
5							

Note: PFMI: Proximal Femur Maturity Index, SD: standard deviation