
Contents

1	Developmental Anatomy	1
	Normal Synchondroses	2
	References.....	9
2	Normal Variations	11
	Vertebral Bodies and Neural Arches.....	11
	Normal Cervical Spine Motion Causing Pseudoabnormalities	11
	High Anterior Arch of C1	12
	Exaggerated C1–C2 Interspinous Distance	12
	C1-to-Dens (Predental Distance)	13
	Posterior Dislocation of Vertebral Bodies.....	13
	Anterior Angulation of C2 on C3	13
	Anterior Dislocation of C2 on C3	14
	Wedging of C3 and C4.....	16
	Normal Apophyseal Joints: Older Child.....	17
	Prevertebral Soft Tissues.....	18
	Ring Epiphysis	18
	Transverse Process Projection Over Disk Spaces	20
	Pseudowidening of the Spinal Canal	20
	Positioning Pseudofractures of the Upper Cervical Spine	23
	Bilateral Offset Lateral Masses of C1 (Increase in Dens–Lateral Mass Distance)	23
	Unilateral Offset Lateral Mass of C1 (Increased Unilateral Dens–Lateral Mass Distance).....	26
	Central Veins	27
	Posticus Ponticus	27
	References.....	29
3	Anomalies	31
	Fusion–Segmentation Anomalies	31
	Fusion Anomalies of Vertebral Bodies	31
	Posterior C1 Arch Defects	34
	Posterior C2 Arch Defects	34
	Posterior Arch Defects: Lower Vertebra.....	38
	Anterior Arch Defects of C1	38
	Dysplastic Neural Arches	39
	References.....	44

4	Anomalies and Normal Variations of the Dens	45
	The Os Terminale–Os Odontoideum Complex.....	45
	Absence of the Dens	50
	Tilting of the Dens	50
	Bifid Dens	51
	References.....	57
5	Trauma	59
	Introduction.....	59
	Forces Involved in Cervical Spine Injury	59
	Plain Film Views Required	59
	Additional Imaging of Cervical Spine Trauma.....	60
	Plain Film Signs of Cervical Spine Instability.....	61
	Specific Injuries	61
	Lower Cervical Spine Injuries	61
	Flexion Force Induced Injuries	61
	Extension Force Induced Injuries	64
	Lateral Flexion Injuries.....	68
	Rotational Injuries.....	68
	Axial Load Compression Fractures	72
	Upper Cervical Spine (C1–C2) Injuries.....	72
	Flexion Force Induced Injuries	72
	Hyperextension Force Induced Injuries	76
	Lateral Flexion Force Induced Injuries.....	81
	Rotational Force Induced Injuries.....	81
	Axial Force Induced Injuries.....	84
	Atlanto-Occipital Disassociation	87
	SCIWORA Syndrome.....	88
	Brachial Plexus Injuries	89
	Motion Artifact: Pseudofracture CT Reconstruction	89
	References.....	92
6	Miscellaneous Cervical Spine Problems	95
	Inflammation–Infection.....	95
	Neoplastic Diseases; Malignant and Benign.....	96
	Spinal Cord Tumors and Other Expanding Lesions	101
	Neurofibromatosis.....	101
	Histiocytosis X; Langerhans Cell Histiocytosis.....	102
	Atlanto-Occipital Instability	103
	Spinal Stenosis	103
	References.....	105
	Index.....	107