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# References

## Further Reading

### General

- Abel R, Gerner HJ, Mariß G (1998) *Wirbelsäule und Rückenmark, Klinischer Leitfaden*. Blackwell, Oxford
- Dihlmann W (1987) *Gelenke – Wirbelverbindungen, Klinische Radiologie – Diagnose, Differentialdiagnose*. Thieme, Stuttgart
- Grumme T, Kluge W, Kretschmar K, Roesler A (1998) *Zerebrale und Spinale Computertomographie*. Blackwell Wissenschafts-Verlag, Berlin
- Krämer J, Schleberger R, Hedtmann A (1997) *Bandscheibenbedingte Erkrankungen. Ursachen, Diagnose, Behandlung, Vorbeugung, Begutachtung*. Thieme, Stuttgart
- Lissner J, Seiderer M (1990) *Klinische Kernspintomographie*. Enke, Stuttgart
- Modic MT, Ross JS, Mararyk TJ (1989) *Magnetic resonance of the spine*. Year Book, Chicago
- Rummeny EJ, Reimer P, Heindel W (2002) *Ganzkörper-MR-Tomographie. Referenz-Reihe-Radiologie*. Thieme, Stuttgart
- Runge VM, Bittner DF, Awh MH, Kirsch JE (1995) *Magnetic resonance imaging of the spine*. J.B. Lippincott, Philadelphia
- Uhlenbrock D (1992) *Radiologische Diagnostik: Kernspintomographie der Wirbelsäule und des Spinalkanals*. Thieme, Stuttgart
- Uhlenbrock D (2001) *MRT der Wirbelsäule und des Spinalkanals. Referenz-Reihe Radiologie*. Thieme, Stuttgart
- Vahlensieck M, Reiser M (2002) *MRT des Bewegungsapparats*. Thieme, Stuttgart

### Chapter 1: Normal Anatomy and Variants

- Küper K (2001) *MR/CT-Atlas der Anatomie. Version 5, CD-ROM with Booklet*. Thieme, Stuttgart
- Lustrin ES, Karakas SP, Ortiz AO et al. (2003) *Pediatric cervical spine: normal anatomy, variants, and trauma*. *RadioGraphics* 23:539
- White AA, Panjabi MM (1978) *The basic kinematics of the human spine*. *Spine* 3:12–20
- Zur Nedden D, Putz R (1985) *Anatomie und Computertomographie des lumbalen Wirbelkanals*. *Röntgenprax* 38:153–157

### Chapter 2: Congenital and Developmental Anomalies

- Acosta FL Jr, Quinones-Hinojosa A, Schmidt MH, Weinstein PR (2003) *Diagnosis and management of sacral Tarlov cysts. Case report and review of the literature*. *Neurosurg Focus* 15:E15

- Bassiouni H, Hunold A, Asgari S, Hubschen U, König HJ, Stolke D (2004) *Spinal intradural juxtamedullary cysts in the adult: surgical management and outcome*. *Neurosurgery* 55:1352–1360
- Beyer HK (2003) *MRT der Gelenke und der Wirbelsäule. Radiologisch-orthopädische Diagnostik*. Springer, Berlin Heidelberg, New York, Tokio
- Bulsara KR, Zomorodi AR, Villavicencio AT, Fuchs H, George TM (2001) *Clinical outcome differences for lipomyelomeningocele, intraspinal lipomas and lipomas of the filum terminale*. *Neurosurg Rev* 24:192–194
- Chang IC (2004) *Surgical experience in symptomatic congenital intraspinal cysts*. *Pediatr Neurosurg* 40:165–170
- Christ B, Wilting J (1992) *From somites to vertebral column*. *Ann Anat* 174:23–32
- Cohen E, Stuecker RD (2005) *Magnetic resonance imaging in diagnosis and follow-up of impending spondylolysis in children and adolescents: early treatment may prevent pars defects*. *J Pediatr Orthop B* 14:63–67
- Dai L, Yuan W, Ni B, Jia L (2000) *Os odontoideum: etiology, diagnosis and management*. *Surg Neurol* 53:106–108
- Davis PC, Hoffmann JC Jr, Ball TI et al. (1988) *Spinal abnormalities in pediatric patients: MR imaging findings compared with clinical, myelographic, and surgical findings*. *Radiology* 166:679 – 685
- Dorward NL, Scatliff JH, Hayward RD (2002) *Congenital lumbosacral lipomas. Pitfalls in analysing the results of prophylactic surgery*. *Child Nerv Syst* 18:326–332
- Forlin E, Herscovici D, Bowen JR (1992) *Understanding the os odontoideum*. *Orthop Rev* 21:1441–1471
- French BN (1982) *The embryology of spinal dysraphism*. *Clin Neurosurg* 30:295–340
- Gräulich W, Pyle S (1966) *Radiography atlas of skeletal development of the hand and wrist*. Oxford University Press, London, 1966
- Hendrick EB, Hoffman HJ, Humphreys RP (1983) *The tethered spinal cord*. *Clinical Neurosurg* 30:457–463
- Inoue M, Minami S, Nakata Y et al. (2005) *Preoperative MRI analysis of patients with idiopathic scoliosis: a prospective study*. *Spine* 30:108–114
- Klekamp J (2002) *The pathophysiology of syringomyelia –historical overview and current concept*. *Acta Neurochir (Wien)* 144:649–664
- Klekamp J, Samii M (Hrsg) (2001) *Syringomyelia- diagnosis and treatment*. Springer, Berlin Heidelberg New York Tokyo
- Köhler A, Zimmer EA (1967) *Grenzen des Normalen und Anfänge des Pathologischen im Röntgenbild des Skeletts*, 11th edn. Thieme, Stuttgart
- Krings T, Lukas R, Reul J, Spetzger U, Reinges MH, Gilsbach JM, Thron A (2001) *Diagnostic and therapeutic management of spinal arachnoid cysts*. *Acta Neurochir (Wien)* 143:227–234
- Langdown AJ, Grundy JR, Birch NC (2005) *The clinical relevance of Tarlov cysts*. *J Spinal Disord Tech* 18:29–33

- Liljenquist U (2004) The natural history of congenital defects and deformities of the spine (I). *Versicherungsmedizin* 56:174–177
- Lonstein J, Bradford D, Winter R, Ogilvie J (Hrsg) (1995) Moe's textbook of scoliosis and other spinal deformities, 3rd edn. Saunders, Philadelphia
- Marquardt E (1968) Entwicklungsstörungen der Wirbelsäule bei Dysmelien. In: Lange M, Motta C (Hrsg) Orthopädischer Gemeinschaftskongreß 1966. Enke, Stuttgart
- McLone DG, Knepper PA (1889) The cause of Chiari II malformation: a unified theory. *Paediatric Neurosci* 15:1–12
- Muraszko K, Youkilis A (2000) Intramedullary spinal tumors of disordered embryogenesis. *J Neurooncol* 47:271–281
- Naidich TP et al. (2001) Congenital anomalies of the spine and spinal cord. In: Atlas SW (Hrsg) Magnetic imaging of the brain and spine, 3rd edn. Lippincott, Williams & Wilkins, Philadelphia, pp 1527–1631
- McLone DI (2000) Congenital malformations of the central nervous system. *Clin Neurosurg* 47:346–377
- Okumura R, Minami S, Asato R, Konishi J (1990) Fatty filum terminale: assessment with MR imaging. *J Comput Assist Tomogr* 14:571–573
- Pang D, Dias MS, Ahab-Barmada M (1992) Split cord malformation. Part I. A unified theory of embryogenesis for double spinal cord malformations. *Neurosurgery* 31:451–480
- Pang D, Wildberger JE (1982) Tethered cord syndrome in adults. *J Neurosurg* 57:32–47
- Raghavan N, Barkovich AJ, Edwards M, Norman D (1989) MR imaging in the tethered spinal cord syndrome. *AJNR* 10:27–36
- Scatliff JH, Kendall BE, Kingsley DPE, Britton J (1989) Closed spinal dysraphism: analysis of clinical, radiological and surgical findings in 104 consecutive patients. *Am J Roentgenol* 152:1049–1057
- Sgouros S, Williams B (1996) Management and outcome of post-traumatic syringomyelia. *J Neurosurg* 85:197–205
- Töndury G (1958) Entwicklungsgeschichte und Fehlbildungen der Wirbelsäule. Die Wirbelsäule in Forschung und Praxis, vol. 7. Hippokrates, Stuttgart
- Uchino A, Mori T, Ohno M (1991) Thickened fatty filum terminale. *Neuroradiology* 33:331–333
- Weber U, Schwetlick G (1994) Wirbelsäulenerkrankungen Wirbelsäulenverletzungen. Operative Therapie – Stabilisierungsverfahren. Thieme, Stuttgart
- Williams B (1972) Pathogenesis of syringomyelia. *Lancet* ii: 969–970
- Wittenberg RH, Willburger RE, Krämer J (1998) Spondylolyse und Spondylolisthese. Diagnose und Therapie. *Orthopäde* 27:51–63
- Yu YL, Mosely IF (1987) Syringomyelia and cervical spondylosis: a clinicoradiological investigation. *Neuroradiology* 29:143–151
- Gundry CR, Fritts HM (1997) Magnetic resonance imaging of the musculoskeletal system. *Spine Clin Orthop Rel Res* 138:275–287
- Hawighorst H, Berger MF, Moulin P, Zäch GA (2001) MRT bei spinaligamentären Verletzungen. *Radiologe* 41:307–322
- Kathol MH (1997) Cervical spine trauma. What is new? *Radiol Clin N Amer* 3:507–532
- Kress B, Bähren W (2001) Wertigkeit der MRT in der Akutdiagnostik von spinalen Traumen. *Röntgenpraxis* 54:71–76
- Louis R (1982) Chirurgie du rachis: Anatomie chirurgicale et voies d'abord. Springer, Berlin Heidelberg New York
- Magerl F, Aebi M, Gertzbein SD, Harms J, Nazarian S (1994) A comprehensive classification of thoracic and lumbar fractures. *Eur Spine J* 3:184–201
- Quencer RM, Bunge RP, Egnor M et al. (1992) Acute traumatic central cord syndrome: MRI-pathologic correlation. *Neuroradiology* 34:85–94
- Shellock FG, Morisoli S, Kanal E (1993) MR procedures and biomedical implants, materials, and devices: 1993 update. *Radiology* 189:587–599
- Sliker CW, Mirvis SE, Shanmuganathan S (2005) Assessing cervical spine stability in obtunded blunt trauma patients: review of medical literature. *Radiology* 234:733–739
- Teli M, De Roeck N, Horowitz MD, Saifuddin A, Green R, Noordeen H (2005) Radiographic outcome of vertebral bone bruise associated with fracture of the thoracic and lumbar spine in adults. *Eur Spine J* 14:541–545
- Terk MR, Hume-Neal M, Fraipont M et al. (1997) Injury of the posterior ligament complex in patients with acute trauma: evaluation by MR imaging. *Am J Roentgenol* 168:1481–1486
- Weber U, Schwetlick G (1994) Wirbelsäulenerkrankungen Wirbelsäulenverletzungen. Operative Therapie – Stabilisierungsverfahren. Thieme, Stuttgart

### Chapter 3: Trauma and Fractures

- Davis SJ, Terest LM, Bradley WG Jr et al. (1991) Cervical spine hyperextension injuries: MR Findings. *Radiology* 180:245
- Dvorak J, Grob D (1999) Halswirbelsäule – Diagnostik und Therapie. Thieme, Stuttgart
- Gergy BA, Jesselink JR (1994) MR imaging of the spine: recent advances in pulse sequences and special techniques. *Am J Roentgenol* 162:923–924
- Giuliano V, Giuliano C, Pinto F, Scaglione M (2002) The use of flexion and extension MR in the evaluation of cervical spine trauma: initial experience in 100 trauma patients compared with 100 normal subjects. *Emerg Radiol* 9:249–253

### Chapter 4: Degenerative Disorders

- Allgayer B, Frank A, Daller D, von Einsiedel H, Trappe A (1993) Die Magnetresonanztomographie in der Diagnostik des Failed Back Surgery Syndroms. *Fortschr Röntgenstr* 158:160–165
- Amundsen T, Weber H, Lileas F et al. (1995) Lumbar spinal stenosis: clinical and radiologic features. *Spine* 20:1178
- Annertz M, Jönsson B, Strömqvist B, Holtas S (1995) Serial MRI in early postoperative period after lumbar discectomy. *Neuroradiology* 37:177–182
- Claussen C, Grumme T, Treitsch J, Lochner B, Kazner E (1982) Die Diagnostik des lumbalen Bandscheibenvorfalles. *Fortschr Röntgenstr* 136:1–8
- Delank KS, Furderer S, Popken F, Eysel P (2004) Juxta-facet cysts as a differential diagnosis for lumbar neuralgia. *Z Orthop/Grenzgeb* 142:410–414
- Dihlmann W (1987) Lumbaler Repronlaps oder Narbengewebe? *Fortschr Röntgenstr* 146:330–334
- Freund M, Hutzelmann A, Steffens C et al. (1997) MR-Myelographie bei Spinalkanalstenosen. *Fortschr Röntgenstr* 167:474
- Healy JF, Healy BB, Wong WHM, Olson EM (1996) Cervical and lumbar MRI in asymptomatic older male lifelong athletes: frequency of degenerative findings. *J Comput Assist Tomogr* 20:107–112
- Kafer W, Cakir B, Richter M (2004) Osteoarthritis – a rare indication for atlantoaxial fusion. A case report and review of the literature. *Acta Orthop Belg* 70:380–385
- Kahn T, Quaschling U, Engelbrecht V (2004) MRT diagnosis for degenerative changes in the spine. *Radiologe* 44:789–799

- Khan AM, Synnot K, Cammisa FP, Girardi FP (2005) Lumbar synovial cysts of the spine: an evaluation of surgical outcome. *J Spinal Disord Tech* 18: 127–131
- Lane JI, Koeller KK, Atkinson JDL (1996) MR imaging of the lumbar spine: enhancement of the radicular veins. *Am J Roentgenol* 166:181–186
- Lang P, Genant HK, Chafetz N, Steiger P, Stoller D (1987) Magnetresonanztomographie bei der Beurteilung funktioneller Stabilität posterlateraler lumbaler Spondylodesen. *Fortschr. Röntgenstr* 147:420–426
- Milette PC, Fontaine S, Lepanto L, Dery R, Breton G (1996) Clinical impact of contrast-enhanced MR imaging reports in patients with previous lumbar disk surgery. *Am J Roentgenol* 167:217–223
- Modic MT, Masaryk TJ, Ross JS, Carter JR (1988) Imaging of degenerative disk disease. *Radiology* 168:177–186
- Resnick D, Niwayama G (1988) *Diagnosis of bone and joint disorders*. Saunders, Philadelphia
- Ulmer JL, Elster AD, Mathews VP, Allen AM (1995) Lumbar spondylosis: reactive marrow changes seen in adjacent pedicles on MR images. *Am J Roentgenol* 164:429–433
- Verbiest H (1984) Stenose des knöchernen lumbalen Wirbelkanals. In: Hohmann D, Kügelgen B, Lübig K, Schirmer M (eds.) *Neuroorthopädie 2*. Springer, Berlin Heidelberg New York Tokio, pp 231–270
- Yu S, Haughton VM, Ho PSP, Sether LA, Wagner M, Ho KC (1980) Progressive and regressive changes in the nucleus pulposus. Part. II. The adult. *Radiology* 169:93–97

## Chapter 5: Inflammatory Conditions

- Andronikou S, Albuquerque-Jonathan G, Wilmshurst J, Hewlett R (2003) MRI findings in acute idiopathic transverse myelopathy in children. *Pediatr Radiol* 33:624–629
- Baraliakos X, Landewe R, Hermann KG et al. (2005) Inflammation in ankylosing spondylitis: a systematic description of the extent and frequency of acute spinal changes using magnetic resonance imaging. *Ann Rheum Dis* 64: 730–734
- Fangerau T, Multiple Sclerosis Study Group (2004) Diagnosis of multiple sclerosis: comparison of the Poser criteria and the new McDonald criteria. *Acta Neurol Scand* 109:385–389
- Grob D (2004) Surgical aspects of the cervical spine in rheumatoid arthritis. *Orthopäde* 33: 1201–1212, quiz 1213–1214
- Karhu JO, Parkkola RK, Koskinen SK (2005) Evaluation of flexion/extension of the upper cervical spine in patients with rheumatoid arthritis: an MRI study with a dedicated positioning device compared to conventional radiographs. *Acta Radiol* 46:55–66
- Lycklama A Nijeholt GJ, Uitdehaag BM, Bergers E, Castelijns JA, Polman CH, Barkhof F (2000) Spinal cord magnetic resonance imaging in suspected multiple sclerosis. *Eur Radiol* 10:368–376
- Miller DH, Filippi M, Fazekas F, Frederiksen JL, Matthews PM, Montalban X, Polman CH (2004) Role of magnetic resonance imaging within diagnostic criteria for multiple sclerosis. *Ann Neurol* 56:273–278
- Mushlin AI, Detsky AS, Phelps CE et al. (1993) The accuracy of magnetic resonance imaging in patients with suspected multiple sclerosis. The Rochester-Toronto Magnetic Resonance Imaging Group. *JAMA* 269:3146–3151
- Radue EW, Kappos L (2003) Vancouver Consortium of MS Centers' Magnetic Resonance Imaging Guidelines. *Int MS* 10:131–133
- Rudwaleit M, Baraliakos S, Listing J, Brandt J, Sieper J, Braun J (2005) Magnetic resonance imaging of the spine and the sacroiliac joints in ankylosing spondylitis before and during therapy with etanercept. *Ann Rheum Dis* 64:1305–1310
- Sommer OJ, Kladosek A, Weiler V, Czembirek H, Boeck M, Stiskal M (2005) Rheumatoid arthritis: a practical guide to state-of-the-art imaging, image interpretation, and clinical implications. *RadioGraphics* 25:381–398
- Tullman MJ, Delman BN, Lublin FD, Weinberger J (2003) Magnetic resonance imaging of meningo-radicular myelitis in early disseminated Lyme disease. *J Neuroimaging* 13:264–258
- Weber U, Rettig H, Jungbluth H (1985) *Knochen- und Gelenktuberkulose*. Perimed Fachbuch-Verlagsgesellschaft mbH, Erlangen

## Chapter 6: Tumors and Tumor-like Lesions

- Abbot R, Shiminski-Maher T, Epstein FJ (1996) Intrinsic tumors of the medulla: predicting outcome after surgery. *Pediatr Neurosurg* 25:41–44
- Browne TR, Adams RD, Roberson GH (1976) Haemangioblastoma of the spinal cord. Review and report of five cases. *Arch Neurol* 33:435–441
- De Verdelhan O, Haegelen C, Carsin-Nicol B, Riffaud L, Amlashi SF, Brassier G, Carsin M, Morandi X (2005) MR imaging features of spinal schwannomas and meningiomas. *J Neuroradiol* 32:42–49
- Fine KJ, Kricheff II, Freed D, Epstein FJ (1995) Spinal cord ependymomas: MR imaging features. *Radiology* 197:655–658
- Fourney DR, Gokaslan ZL (2003) Current management of sacral chordoma. *Neurosurg Focus* 15: E9
- Guzey F, Seyithanoglu MH, Sencer A, Emei E, Alatas I, Izgi AN (2004) Vertebral osteoid osteoma associated with paravertebral soft-tissue changes on magnetic resonance imaging. Report of two cases. *J Neurosurg* 100 (Suppl Pediatrics): 532–536
- Immenkamp M, Härle A (1994) *Geschwülste der Wirbelsäule. Knochentumoren in: Orthopädie in Praxis und Klinik, Band V/2*. A.N. Witt, M. Rettig, K.F. Schlegel. Thieme Stuttgart-New York
- Jallo GI, Zagzag D, Lee M, Deletis V, Morota N, Epstein FJ (1997) Intraspinal sarcoidosis: diagnosis and management. *Surg Neurol* 48:514–520
- Joerger M et al. (2005) Von Hippel-Lindau disease – a rare disease important to recognise. *Onkologie* 28:159–163
- Klekamp J, Samii M (2005) *Tumoren des Spinalkanals*. In: Moskopp D, Wassmann H (eds.) *Neurochirurgie*. Schattauer, Stuttgart New York, pp 616–634
- Li MH, Holtas S, Larsson EM (1992) MR imaging of intradural extramedullary tumors. *Acta Radiol* 33:207–212
- Pans S, Brys R, Van Breuseghem I, Geusens E (2005) Benign bone tumours of the spine. *JBR-BTR* 88:31–37
- Papagelopoulos PJ, Mavrogenis AF, Galanis EC, Savvidou OD, Boscaiños PJ, Katonis PG, Sim FH (2004) Chordoma of the spine: clinicopathological features, diagnosis, and treatment. *Orthopedics* 27:1256–1263, quiz 1264–1265
- Roux FX, Nataf F, Pinaudeau M, Borne G, Devaux B, Meder JF (1996) Intraspinal meningiomas: review of 54 cases with discussion of poor prognosis factors and modern therapeutic management. *Surg Neurol* 45:458–463
- Sandalcioglu IE, Gasser T, Asgari S et al. (2005) Functional outcome after surgical treatment of intramedullary spinal cord tumors: experience with 78 patients. *Spinal Cord* 43:34–41

- Schmidt GP, Baur A, Stabler A, Schoenberg SO, Steinborn M, Baltin V, Reiser MF (2005) Diffuse bone marrow infiltration of the spine in multiple myeloma: correlation of the MRI with histological results. *Rofo* 177:745–750
- Shrivastava RK et al. (2005) Intramedullary spinal tumors in patients older than 50 years of age: management and outcome analysis. *J Neurosurgery Spine* 2:249–255

Sung MS, Lee GK, Kang HS et al. (2005) Sacrococcygeal chordoma: MR imaging in 30 patients. *Skeletal Radiol* 34:87–94

## **Chapter 7: The Postoperative Spine**

Hochegger M, Radl R, Leithner A, Windhager R (2005) Spinal canal stenosis after vertebroplasty. *Clin Radiol* 60:397–400

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