

Li-Jen Wang

Key Diagnostic Features in Uroradiology

A Case-Based Guide

 Springer

Key Diagnostic Features in Uroradiology

Li-Jen Wang

Key Diagnostic Features in Uroradiology

A Case-Based Guide

 Springer

Li-Jen Wang, MD
Department of Medical Imaging
Linkou Chang Gung Memorial Hospital
Taoyuan
Taiwan

Department of Medical Imaging
and Radiological Sciences
Institute of Radiological Research
Chang Gung University
Taoyuan
Taiwan

ISBN 978-3-319-08776-4 ISBN 978-3-319-08777-1 (eBook)
DOI 10.1007/978-3-319-08777-1
Springer Cham Heidelberg New York Dordrecht London

Library of Congress Control Number: 2014955671

© Springer International Publishing Switzerland 2015

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Contents

| | | |
|----------|--|----------|
| 1 | Normal Variant and Congenital Anomalies | 1 |
| 1.1 | Renal Agenesis | 1 |
| | Case 1 | 1 |
| | Key Diagnostic Features | 2 |
| | Main Differential Diagnoses | 2 |
| 1.2 | Floating Kidney | 3 |
| | Case 2 | 3 |
| | Key Diagnostic Features | 4 |
| | Main Differential Diagnoses | 4 |
| 1.3 | Renal Ectopia | 5 |
| | Case 3 | 5 |
| | Case 4 | 6 |
| | Case 5 | 7 |
| | Key Diagnostic Features | 8 |
| 1.4 | Malrotation of the Renal Axis | 8 |
| | Case 6 | 8 |
| | Key Diagnostic Features | 9 |
| | Main Differential Diagnosis | 9 |
| 1.5 | Horseshoe Kidney | 10 |
| | Case 7 | 10 |
| | Case 8 | 11 |
| | Key Diagnostic Features | 12 |
| | Main Differential Diagnosis | 12 |
| 1.6 | Column of Bertin | 12 |
| | Case 9 | 12 |
| | Key Diagnostic Features | 13 |
| | Main Differential Diagnoses | 13 |
| 1.7 | Duplex Kidney | 14 |
| | Case 10 | 14 |
| | Case 11 | 14 |
| | Case 12 | 15 |
| | Key Diagnostic Features | 15 |
| 1.8 | Duplex Ureters | 16 |
| | Case 13 | 16 |
| | Key Diagnostic Features | 17 |
| 1.9 | Ectopic Ureter Insertion to the Vagina | 18 |
| | Case 14 | 18 |
| | Case 15 | 19 |
| | Key Diagnostic Features | 19 |

| | | |
|----------|---|-----------|
| 1.10 | Simple Ureterocele | 20 |
| | Case 16 | 20 |
| | Case 17 | 21 |
| | Key Diagnostic Features | 21 |
| 1.11 | Intravesicular Ectopic Ureterocele in Duplex Ureters | 22 |
| | Case 18 | 22 |
| | Case 19 | 23 |
| | Key Diagnostic Features | 25 |
| 1.12 | Renal Calyceal Diverticulum | 25 |
| | Case 20 | 25 |
| | Key Diagnostic Features | 26 |
| | Main Differential Diagnoses | 26 |
| 1.13 | Medullary Sponge Kidney | 27 |
| | Case 21 | 27 |
| | Key Diagnostic Features | 28 |
| | Main Differential Diagnoses | 28 |
| 1.14 | Extrarenal Pelvis | 29 |
| | Case 22 | 29 |
| | Key Diagnostic Features | 30 |
| | Main Differential Diagnoses | 30 |
| 1.15 | Congenital Ureteropelvic Obstruction | 31 |
| | Case 23 | 31 |
| | Case 24 | 33 |
| | Case 25 | 35 |
| | Key Diagnostic Features | 35 |
| | Main Differential Diagnosis | 35 |
| 1.16 | Primary Megaureter | 36 |
| | Case 26 | 36 |
| | Case 27 | 37 |
| | Key Diagnostic Features | 37 |
| 1.17 | Vesicoureteral Reflux | 38 |
| | Case 28 | 38 |
| | Case 29 | 39 |
| | Key Diagnostic Features | 39 |
| 1.18 | Seminal Vesicle Cysts with Ipsilateral Renal Agenesis | 40 |
| | Case 30 | 40 |
| | Key Diagnostic Features | 41 |
| | Main Differential Diagnoses of Congenital Seminal Vesicle Cysts | 41 |
| 1.19 | Urachal Cyst | 42 |
| | Case 31 | 42 |
| | Key Diagnostic Features | 42 |
| 1.20 | Hematocolpos by Imperforate Hymen | 43 |
| | Case 32 | 43 |
| | Key Diagnostic Features | 44 |
| 1.21 | Uterus Didelphys with Renal Agenesis and Hematocolpos | 45 |
| | Case 33 | 45 |
| | Key Diagnostic Features | 45 |
| | References | 47 |
| 2 | Urinary Tract Infection and Inflammation | 49 |
| 2.1 | Acute Pyelonephritis | 49 |
| | Case 1 | 49 |
| | Case 2 | 49 |
| | Case 3 | 50 |
| | Key Diagnostic Features | 50 |
| | Main Differential Diagnoses | 50 |

| | | |
|------|--|----|
| 2.2 | Nephronia | 51 |
| | Case 4 | 51 |
| | Key Diagnostic Features | 52 |
| | Main Differential Diagnoses | 52 |
| 2.3 | Renal Abscess | 52 |
| | Case 5 | 52 |
| | Case 6 | 53 |
| | Key Diagnostic Features | 53 |
| | Main Differential Diagnoses | 53 |
| 2.4 | Renal Subcapsular Abscess | 54 |
| | Case 7 | 54 |
| | Key Diagnostic Features | 55 |
| | Main Differential Diagnoses | 55 |
| 2.5 | Perinephric Abscess | 56 |
| | Case 8 | 56 |
| | Case 9 | 57 |
| | Key Diagnostic Features | 57 |
| | Main Differential Diagnoses | 57 |
| 2.6 | Pyonephrosis | 58 |
| | Case 10 | 58 |
| | Key Diagnostic Features | 59 |
| | Main Differential Diagnoses | 59 |
| 2.7 | Emphysematous Pyelitis | 59 |
| | Case 11 | 59 |
| | Key Diagnostic Features | 60 |
| | Main Differential Diagnoses | 60 |
| 2.8 | Emphysematous Pyelonephritis | 61 |
| | Case 12 | 61 |
| | Case 13 | 62 |
| | Key Diagnostic Features | 62 |
| | Main Differential Diagnoses | 62 |
| 2.9 | Xanthogranulomatous Pyelonephritis | 63 |
| | Case 14 | 63 |
| | Case 15 | 64 |
| | Case 16 | 65 |
| | Key Diagnostic Features | 65 |
| 2.10 | Renal Actinomycosis | 66 |
| | Case 17 | 66 |
| | Key Diagnostic Features | 66 |
| 2.11 | Chronic Pyelonephritis | 67 |
| | Case 18 | 67 |
| | Case 19 | 67 |
| | Case 20 | 68 |
| | Key Diagnostic Features | 69 |
| | Main Differential Diagnoses | 69 |
| 2.12 | Pyelitis Glandularis | 69 |
| | Case 21 | 69 |
| | Key Diagnostic Features | 70 |
| 2.13 | Tuberculosis of the Urinary Tract | 71 |
| | Case 22 | 71 |
| | Case 23 | 72 |
| | Case 24 | 73 |
| | Case 25 | 74 |
| | Key Diagnostic Features | 74 |

| | | |
|----------|---|-----------|
| 2.14 | Renal Tuberculosis | 75 |
| | Case 26 | 75 |
| | Case 27 | 76 |
| | Case 28 | 76 |
| | Case 29 | 77 |
| | Case 30 | 78 |
| | Case 31 | 78 |
| | Key Diagnostic Features | 79 |
| 2.15 | Ureteral Tuberculosis | 80 |
| | Case 32 | 80 |
| | Case 33 | 82 |
| | Case 34 | 83 |
| | Key Diagnostic Features | 84 |
| 2.16 | Urinary Bladder Tuberculosis | 84 |
| | Case 35 | 84 |
| | Case 2 | 85 |
| | Case 36 | 85 |
| | Key Diagnostic Features | 86 |
| 2.17 | Emphysematous Cystitis | 86 |
| | Case 37 | 86 |
| | Case 38 | 87 |
| | Key Diagnostic Features | 88 |
| | Main Differential Diagnoses | 88 |
| 2.18 | Pneumocystitis (Gas in the Bladder Lumen) | 88 |
| | Case 39 | 88 |
| | Case 40 | 89 |
| | Key Diagnostic Features | 89 |
| | Main Differential Diagnoses | 89 |
| 2.19 | Cystitis Cystica and Cystitis Glandularis | 90 |
| | Case 41 | 90 |
| | Case 42 | 90 |
| | Key Diagnostic Features | 91 |
| 2.20 | Interstitial Cystitis | 91 |
| | Case 43 | 91 |
| | Key Diagnostic Features | 92 |
| 2.21 | Polypoid Cystitis | 93 |
| | Case 44 | 93 |
| | Key Diagnostic Features | 93 |
| 2.22 | Inflammatory Myofibroblastic Tumor (Inflammatory Pseudotumor) of the Urinary Bladder | 94 |
| | Case 45 | 94 |
| | Key Diagnostic Features | 94 |
| | References | 95 |
| 3 | Renal Cystic Disease | 97 |
| 3.1 | Renal Simple Cyst: Bosniak's Category I | 97 |
| | Case 1 | 97 |
| | Key Diagnostic Features | 98 |
| 3.2 | Renal Cystic Masses of Bosniak's Category II | 99 |
| | Case 2 | 99 |
| | Case 3 | 99 |
| | Case 4 | 101 |
| | Key Diagnostic Features | 101 |

| | | |
|------|--|-----|
| 3.3 | Renal Cystic Masses of Bosniak's IIF Category | 102 |
| | Case 5 | 102 |
| | Case 6 | 102 |
| | Key Diagnostic Features | 103 |
| 3.4 | Renal Cystic Masses of Bosniak's Category III | 104 |
| | Case 7 | 104 |
| | Case 8 | 105 |
| | Case 9 | 105 |
| | Key Diagnostic Features | 106 |
| 3.5 | Renal Cystic Masses of Bosniak's Category IV | 107 |
| | Case 10 | 107 |
| | Case 11 | 108 |
| | Key Diagnostic Features | 108 |
| 3.6 | Renal Hemorrhagic Cysts | 109 |
| | Case 12 | 109 |
| | Case 13 | 110 |
| | Case 14 | 110 |
| | Key Diagnostic Features | 111 |
| | Main Differential Diagnosis | 111 |
| 3.7 | Milk of Calcium Cyst | 112 |
| | Case 15 | 112 |
| | Case 16 | 113 |
| | Key Diagnostic Features | 113 |
| 3.8 | Renal Infected Cyst | 114 |
| | Case 17 | 114 |
| | Case 18 | 115 |
| | Key Diagnostic Features | 115 |
| 3.9 | Renal Cyst Rupture | 116 |
| | Case 19 | 116 |
| | Key Diagnostic Features | 116 |
| 3.10 | Parapelvic Cyst | 117 |
| | Case 20 | 117 |
| | Case 21 | 118 |
| | Key Diagnostic Features | 119 |
| | Main Differential Diagnosis | 119 |
| 3.11 | Multilocular Cystic Nephroma | 120 |
| | Case 22 | 120 |
| | Key Diagnostic Features | 121 |
| | Main Differential Diagnosis | 121 |
| 3.12 | Renal Lymphangiomatosis | 122 |
| | Case 23 | 122 |
| | Key Diagnostic Features | 122 |
| 3.13 | Multilocular Cystic Renal Cell Carcinomas | 123 |
| | Case 24 | 123 |
| | Case 25 | 123 |
| | Case 26 | 124 |
| | Key Diagnostic Features | 125 |
| | Main Differential Diagnoses | 125 |
| 3.14 | Renal Cysts Associated with Tuberous Sclerosis Complex (TSC) | 125 |
| | Case 27 | 125 |
| | Key Diagnostic Features | 126 |
| 3.15 | Renal Cysts Associated with Von Hippel-Lindau (VHL) Disease | 127 |
| | Case 28 | 127 |
| | Key Diagnostic Features | 128 |

| | | |
|----------|--|------------|
| 3.16 | Autosomal Dominant Polycystic Kidney Disease | 129 |
| | Case 29 | 129 |
| | Case 30 | 129 |
| | Case 31 | 130 |
| | Key Diagnostic Features | 131 |
| 3.17 | Acquired Renal Cystic Disease | 132 |
| | Case 32 | 132 |
| | Case 33 | 133 |
| | Key Diagnostic Features | 134 |
| | Main Differential Diagnosis | 134 |
| 3.18 | Multicystic Dysplastic Kidney Disease | 135 |
| | Case 34 | 135 |
| | Case 35 | 137 |
| | Key Diagnostic Features | 137 |
| 3.19 | Unilateral Renal Cystic Disease | 138 |
| | Case 36 | 138 |
| | Key Diagnostic Features | 139 |
| | Main Differential Diagnosis | 139 |
| | References | 139 |
| 4 | Renal Parenchymal Neoplasms | 141 |
| 4.1 | Clear Cell Renal Cell Carcinoma | 141 |
| | Case 1 | 141 |
| | Case 2 | 142 |
| | Case 3 | 143 |
| | Case 4 | 144 |
| | Case 5 | 145 |
| | Case 6 | 146 |
| | Key Diagnostic Features | 146 |
| 4.2 | Chromophobe Renal Cell Carcinoma | 147 |
| | Case 7 | 147 |
| | Case 8 | 148 |
| | Case 9 | 149 |
| | Key Diagnostic Features | 149 |
| 4.3 | Papillary Renal Cell Carcinoma | 150 |
| | Case 10 | 150 |
| | Case 11 | 151 |
| | Case 12 | 152 |
| | Key Diagnostic Features | 152 |
| 4.4 | Collecting Duct Carcinoma | 153 |
| | Case 13 | 153 |
| | Key Diagnostic Features | 153 |
| 4.5 | Renal Cell Carcinoma with Perinephric Extension and Lymph Node Metastasis | 154 |
| | Case 14 | 154 |
| | Key Diagnostic Features | 154 |
| 4.6 | Cystic Renal Cell Carcinomas | 155 |
| | Case 15 | 155 |
| | Case 16 | 155 |
| | Key Diagnostic Features | 156 |
| | Main Differential Diagnoses | 156 |
| 4.7 | Renal Small Cell Carcinoma | 156 |
| | Case 17 | 156 |
| | Case 18 | 157 |
| | Key Diagnostic Features | 158 |

| | | |
|------|---|-----|
| 4.8 | Renal Sarcoma | 158 |
| | Case 19 | 158 |
| | Key Diagnostic Features | 159 |
| | Main Differential Diagnoses | 159 |
| 4.9 | Renal Lymphoma | 160 |
| | Case 20 | 160 |
| | Case 21 | 161 |
| | Key Diagnostic Features | 161 |
| 4.10 | Primitive Neuroectodermal Tumor (PNET) of the Kidney | 162 |
| | Case 22 | 162 |
| | Case 23 | 163 |
| | Key Diagnostic Features | 163 |
| 4.11 | Renal Metastasis | 164 |
| | Case 24 | 164 |
| | Key Diagnostic Features | 165 |
| | Main Differential Diagnosis | 165 |
| 4.12 | Renal Angiomyolipomas With Detectable or Abundant Fat | 165 |
| | Case 25 | 165 |
| | Case 26 | 166 |
| | Case 27 | 167 |
| | Key Diagnostic Features | 168 |
| 4.13 | Renal Angiomyolipomas With Minimal or Undetectable Fat | 168 |
| | Case 28 | 168 |
| | Case 29 | 169 |
| | Case 30 | 169 |
| | Key Diagnostic Features | 170 |
| 4.14 | Exophytic Renal Angiomyolipomas | 170 |
| | Case 31 | 170 |
| | Case 32 | 171 |
| | Case 33 | 171 |
| | Key Diagnostic Features | 172 |
| 4.15 | Renal Angiomyolipomas With Spontaneous Bleeding | 172 |
| | Case 34 | 172 |
| | Case 35 | 173 |
| | Case 36 | 174 |
| | Key Diagnostic Features | 174 |
| 4.16 | Renal Angiomyolipomas with Aneurysmal Dilatation of Tumor Vessels | 175 |
| | Case 37 | 175 |
| | Case 38 | 176 |
| | Key Diagnostic Features | 176 |
| | Main Differential Diagnoses | 176 |
| 4.17 | Renal Angiomyolipomas with IVC Thrombosis or Distant Metastasis | 177 |
| | Case 39 | 177 |
| | Case 40 | 178 |
| | Key Diagnostic Features | 179 |
| | Main Differential Diagnoses | 179 |
| 4.18 | Renal Oncocytomas | 179 |
| | Case 41 | 179 |
| | Case 42 | 180 |
| | Key Diagnostic Features | 181 |
| 4.19 | Renal Hemangioma | 181 |
| | Case 43 | 181 |
| | Key Diagnostic Features | 182 |

| | | |
|----------|---|------------|
| 4.20 | Renal Leiomyoma. | 182 |
| | Case 44 | 182 |
| | Case 45 | 183 |
| | Key Diagnostic Features. | 183 |
| 4.21 | Wilms' Tumor. | 184 |
| | Case 46 | 184 |
| | Case 47 | 184 |
| | Key Diagnostic Features. | 185 |
| 4.22 | Mesoblastic Nephroma. | 185 |
| | Case 48 | 185 |
| | Key Diagnostic Features. | 186 |
| | References | 186 |
| 5 | Lesions of the Urinary Tract and Renal Sinus | 187 |
| 5.1 | Renal Calyceal Calculi | 187 |
| | Case 1 | 187 |
| | Case 2 | 188 |
| | Case 3 | 188 |
| | Key Diagnostic Features. | 189 |
| 5.2 | Ureteropelvic Junction Calculi | 190 |
| | Case 4 | 190 |
| | Case 5 | 191 |
| | Case 6 | 193 |
| | Key Diagnostic Features. | 194 |
| 5.3 | Renal Staghorn Stone | 195 |
| | Case 7 | 195 |
| | Case 8 | 196 |
| | Case 9 | 197 |
| | Key Diagnostic Features. | 198 |
| 5.4 | Ureteral Calculus | 200 |
| | Case 10 | 200 |
| | Case 11 | 201 |
| | Case 12 | 203 |
| | Case 13 | 204 |
| | Key Diagnostic Features. | 204 |
| 5.5 | Ureterovesical Calculus | 205 |
| | Case 14 | 205 |
| | Case 15 | 206 |
| | Key Diagnostic Features. | 206 |
| 5.6 | Urinary Bladder Calculus | 207 |
| | Case 16 | 207 |
| | Case 17 | 207 |
| | Case 18 | 208 |
| | Case 19 | 209 |
| | Key Diagnostic Features. | 209 |
| 5.7 | Urethral Calculus | 210 |
| | Case 20 | 210 |
| | Case 21 | 211 |
| | Key Diagnostic Features. | 211 |
| 5.8 | Cystocele. | 212 |
| | Case 22 | 212 |
| | Case 23 | 213 |
| | Key Diagnostic Features. | 214 |

| | | |
|------|--|-----|
| 5.9 | Bladder Herniation | 215 |
| | Case 24 | 215 |
| | Case 25 | 216 |
| | Case 26 | 217 |
| | Key Diagnostic Features | 217 |
| 5.10 | Bladder Diverticulum | 218 |
| | Case 27 | 218 |
| | Case 28 | 219 |
| | Key Diagnostic Features | 219 |
| 5.11 | Female Urethral Diverticulum | 220 |
| | Case 29 | 220 |
| | Case 30 | 221 |
| | Key Diagnostic Features | 221 |
| 5.12 | Renal Urothelial Carcinoma | 222 |
| | Case 31 | 222 |
| | Case 32 | 223 |
| | Case 33 | 224 |
| | Case 34 | 225 |
| | Key Diagnostic Features | 225 |
| | Main Differential Diagnoses | 225 |
| 5.13 | Ureteral Urothelial Carcinoma | 226 |
| | Case 35 | 226 |
| | Case 36 | 227 |
| | Case 37 | 228 |
| | Case 38 | 229 |
| | Case 39 | 231 |
| | Key Diagnostic Features | 232 |
| | Main Differential Diagnoses | 232 |
| 5.14 | Bladder Urothelial Carcinomas | 233 |
| | Case 40 | 233 |
| | Case 41 | 234 |
| | Case 42 | 235 |
| | Case 43 | 236 |
| | Case 44 | 236 |
| | Case 45 | 237 |
| | Key Diagnostic Features | 237 |
| | Main Differential Diagnoses | 237 |
| 5.15 | Synchronous Urothelial Carcinomas of Multiple Urinary Organs | 238 |
| | Case 46 | 238 |
| | Case 47 | 240 |
| | Key Diagnostic Features | 240 |
| 5.16 | Urethral Urothelial Carcinoma | 242 |
| | Case 48 | 242 |
| | Case 49 | 242 |
| | Case 50 | 243 |
| | Key Diagnostic Features | 243 |
| 5.17 | Renal Squamous Cell Carcinoma | 244 |
| | Case 51 | 244 |
| | Case 52 | 245 |
| | Case 53 | 247 |
| | Key Diagnostic Features | 248 |
| | Main Differential Diagnosis | 248 |

| | | |
|----------|--|------------|
| 5.18 | Squamous Cell Carcinomas of the Urinary Bladder | 249 |
| | Case 54 | 249 |
| | Key Diagnostic Features | 250 |
| 5.19 | Small Cell Carcinomas of the Urinary Bladder | 251 |
| | Case 55 | 251 |
| | Case 56 | 252 |
| | Case 57 | 253 |
| | Key Diagnostic Features | 254 |
| 5.20 | Adenocarcinomas of the Urinary Bladder | 254 |
| | Case 58 | 254 |
| | Case 59 | 255 |
| | Key Diagnostic Features | 255 |
| 5.21 | Paraganglioma of the Urinary Bladder | 256 |
| | Case 60 | 256 |
| | Case 61 | 257 |
| | Key Diagnostic Features | 257 |
| 5.22 | Renal Angiomyolipomas Located in the Renal Sinus | 258 |
| | Case 62 | 258 |
| | Case 63 | 259 |
| | Case 64 | 260 |
| | Key Diagnostic Features | 261 |
| | Main Differential Diagnoses | 261 |
| 5.23 | Renal Sinus Lipomatosis | 262 |
| | Case 65 | 262 |
| | Key Diagnostic Features | 262 |
| 5.24 | Renal Schwannoma | 263 |
| | Case 66 | 263 |
| | Key Diagnostic Features | 264 |
| 5.25 | Renal Carcinoid Tumor | 264 |
| | Case 67 | 264 |
| | Key Diagnostic Features | 265 |
| | References | 265 |
| 6 | Vascular Diseases and Normal Variants | 267 |
| 6.1 | Multiple Renal Arteries | 267 |
| | Case 1 | 267 |
| | Case 2 | 268 |
| | Case 3 | 269 |
| | Key Diagnostic Features | 269 |
| | Main Differential Diagnoses | 269 |
| 6.2 | Two Right Renal Veins | 270 |
| | Case 4 | 270 |
| | Case 5 | 271 |
| | Key Diagnostic Features | 272 |
| 6.3 | Retroaortic Left Renal Vein | 272 |
| | Case 6 | 272 |
| | Key Diagnostic Features | 273 |
| | Main Differential Diagnoses | 273 |
| 6.4 | Circumaortic Left Renal Veins | 273 |
| | Case 7 | 273 |
| | Key Diagnostic Features | 274 |
| 6.5 | Nutcracker Phenomenon and Syndrome | 275 |
| | Case 8 | 275 |
| | Case 9 | 276 |
| | Case 10 | 277 |
| | Key Diagnostic Features | 277 |

| | | |
|------|---|-----|
| 6.6 | Left Side Inferior Vena Cava | 278 |
| | Case 11 | 278 |
| | Case 12 | 280 |
| | Key Diagnostic Features | 280 |
| | Main Differential Diagnoses | 280 |
| 6.7 | Double Inferior Vena Cava | 281 |
| | Case 13 | 281 |
| | Case 14 | 282 |
| | Key Diagnostic Features | 282 |
| | Main Differential Diagnoses | 282 |
| 6.8 | Circumcaval Ureter (Retrocaval Ureter) | 283 |
| | Case 15 | 283 |
| | Key Diagnostic Features | 285 |
| 6.9 | Renal Artery Aneurysm | 285 |
| | Case 16 | 285 |
| | Case 17 | 286 |
| | Case 18 | 287 |
| | Key Diagnostic Features | 287 |
| 6.10 | Renal Arteriovenous Malformation | 288 |
| | Case 19 | 288 |
| | Case 20 | 289 |
| | Case 21 | 290 |
| | Key Diagnostic Features | 290 |
| 6.11 | Renal Vein Aneurysm | 291 |
| | Case 22 | 291 |
| | Key Diagnostic Features | 292 |
| 6.12 | Renal Vein Varix | 293 |
| | Case 23 | 293 |
| | Key Diagnostic Features | 295 |
| 6.13 | Renal Arterial Stenosis by Artherosclerosis | 295 |
| | Case 24 | 295 |
| | Case 25 | 296 |
| | Key Diagnostic Features | 296 |
| 6.14 | Fibromuscular Dysplasia | 296 |
| | Case 26 | 296 |
| | Case 27 | 297 |
| | Key Diagnostic Features | 297 |
| 6.15 | Polyarteritis Nodosa (PAN) | 298 |
| | Case 28 | 298 |
| | Case 29 | 299 |
| | Key Diagnostic Features | 299 |
| | Main Differential Diagnoses | 300 |
| 6.16 | Renal Infarct | 300 |
| | Case 30 | 300 |
| | Case 31 | 302 |
| | Case 32 | 302 |
| | Case 33 | 303 |
| | Key Diagnostic Features | 303 |
| | Main Differential Diagnoses | 303 |
| 6.17 | Renal Vein Thrombosis | 304 |
| | Case 34 | 304 |
| | Case 35 | 304 |
| | Key Diagnostic Features | 305 |

| | | |
|----------|---|------------|
| 6.18 | Inferior Vena Cava Thrombosis | 305 |
| | Case 36 | 305 |
| | Case 37 | 306 |
| | Key Diagnostic Features | 306 |
| 6.19 | Spontaneous Renal or Retroperitoneal Hemorrhage | 307 |
| | Case 38 | 307 |
| | Case 39 | 308 |
| | Key Diagnostic Features | 308 |
| | References | 309 |
| 7 | Retroperitoneal Diseases | 311 |
| 7.1 | Retroperitoneal Liposarcoma | 311 |
| | Case 1 | 311 |
| | Case 2 | 312 |
| | Key Diagnostic Features | 313 |
| | Main Differential Diagnoses | 313 |
| 7.2 | Malignant Fibrous Histiocytoma of the Retroperitoneum | 314 |
| | Case 3 | 314 |
| | Key Diagnostic Features | 314 |
| | Main Differential Diagnoses | 314 |
| 7.3 | Retroperitoneal Leiomyosarcoma | 315 |
| | Case 4 | 315 |
| | Key Diagnostic Features | 316 |
| 7.4 | Lymphoma With Retroperitoneal Involvement | 317 |
| | Case 5 | 317 |
| | Case 6 | 318 |
| | Key Diagnostic Features | 319 |
| | Main Differential Diagnoses | 319 |
| 7.5 | Retroperitoneal Lymph Node Metastasis | 320 |
| | Case 7 | 320 |
| | Case 8 | 320 |
| | Key Diagnostic Features | 320 |
| 7.6 | Castleman's Disease | 321 |
| | Case 9 | 321 |
| | Case 10 | 322 |
| | Key Diagnostic Features | 322 |
| | Main Differential Diagnosis | 322 |
| 7.7 | Retroperitoneal Schwannoma | 323 |
| | Case 11 | 323 |
| | Case 12 | 324 |
| | Key Diagnostic Features | 325 |
| | Main Differential Diagnosis | 325 |
| 7.8 | Retroperitoneal Neurofibroma | 326 |
| | Case 13 | 326 |
| | Key Diagnostic Features | 326 |
| 7.9 | Retroperitoneal Paraganglioma | 327 |
| | Case 14 | 327 |
| | Case 15 | 328 |
| | Key Diagnostic Features | 328 |
| 7.10 | Retroperitoneal Ganglioneuroma | 329 |
| | Case 16 | 329 |
| | Key Diagnostic Features | 330 |
| | Main Differential Diagnosis | 330 |

| | | |
|----------|---|------------|
| 7.11 | Retroperitoneal Mature Teratoma | 330 |
| | Case 17 | 330 |
| | Key Diagnostic Features | 331 |
| 7.12 | Retroperitoneal Lymphangioma | 331 |
| | Case 18 | 331 |
| | Case 19 | 332 |
| | Key Diagnostic Features | 332 |
| 7.13 | Angiomyolipoma in the Retroperitoneal Space | 333 |
| | Case 20 | 333 |
| | Case 21 | 334 |
| | Case 22 | 335 |
| | Key Diagnostic Features | 336 |
| | Main Differential Diagnoses | 336 |
| 7.14 | Retroperitoneal Fibrosis | 337 |
| | Case 23 | 337 |
| | Case 24 | 338 |
| | Key Diagnostic Features | 339 |
| 7.15 | Retroperitoneal Abscess | 339 |
| | Case 25 | 339 |
| | Case 26 | 341 |
| | Key Diagnostic Features | 341 |
| 7.16 | Retroperitoneal Hematoma | 342 |
| | Case 27 | 342 |
| | Case 28 | 343 |
| | Case 29 | 343 |
| | Key Diagnostic Features | 343 |
| 7.17 | Retroperitoneal Urinoma and Urine Extravasation | 344 |
| | Case 30 | 344 |
| | Case 31 | 345 |
| | Key Diagnostic Features | 346 |
| 7.18 | Psoas Pyogenic Abscess | 346 |
| | Case 32 | 346 |
| | Case 33 | 347 |
| | Key Diagnostic Features | 347 |
| 7.19 | Psoas Cold Abscess by Tuberculosis | 348 |
| | Case 34 | 348 |
| | Case 35 | 350 |
| | Key Diagnostic Features | 351 |
| 7.20 | Iliacus and Psoas Metastasis | 351 |
| | Case 36 | 351 |
| | Case 37 | 352 |
| | Case 38 | 352 |
| | Key Diagnostic Features | 353 |
| | References | 353 |
| 8 | Adrenal Gland | 355 |
| 8.1 | Adrenal Pseudotumor | 355 |
| | Case 1 | 355 |
| | Case 2 | 356 |
| | Case 3 | 356 |
| | Key Diagnostic Features | 357 |
| 8.2 | Adrenal Tuberculosis | 357 |
| | Case 4 | 357 |
| | Key Diagnostic Features | 358 |

| | | |
|------|---|-----|
| 8.3 | Adrenal Extramedullary Hematopoiesis | 358 |
| | Case 5 | 358 |
| | Key Diagnostic Features | 360 |
| 8.4 | Adrenal Hemorrhage | 360 |
| | Case 6 | 360 |
| | Key Diagnostic Features | 361 |
| 8.5 | Adrenal Cyst | 362 |
| | Case 7 | 362 |
| | Case 8 | 363 |
| | Case 9 | 364 |
| | Case 10 | 365 |
| | Case 11 | 365 |
| | Key Diagnostic Features | 366 |
| | Main Differential Diagnoses | 366 |
| 8.6 | Adrenal Hyperplasia | 366 |
| | Case 12 | 366 |
| | Case 13 | 367 |
| | Case 14 | 368 |
| | Key Diagnostic Features | 368 |
| | Main Differential Diagnoses | 368 |
| 8.7 | Adrenal Adenoma | 369 |
| | Case 15 | 369 |
| | Case 16 | 370 |
| | Case 17 | 371 |
| | Key Diagnostic Features | 371 |
| | Main Differential Diagnoses | 372 |
| 8.8 | Adrenal Aldosteronoma (Aldosterone-Producing Adenoma) | 372 |
| | Case 19 | 372 |
| | Case 20 | 373 |
| | Key Diagnostic Features | 374 |
| 8.9 | Adrenal Myelolipoma | 374 |
| | Case 21 | 374 |
| | Case 22 | 375 |
| | Key Diagnostic Features | 375 |
| 8.10 | Adrenal Ganglioneuroma | 376 |
| | Case 23 | 376 |
| | Case 24 | 376 |
| | Key Diagnostic Features | 377 |
| 8.11 | Adrenal Hemangioma | 377 |
| | Case 25 | 377 |
| | Key Diagnostic Features | 378 |
| 8.12 | Adrenal Pheochromocytoma | 379 |
| | Case 26 | 379 |
| | Case 27 | 380 |
| | Case 28 | 380 |
| | Key Diagnostic Features | 381 |
| | Main Differential Diagnoses | 381 |
| 8.13 | Adrenocortical Carcinoma | 382 |
| | Case 29 | 382 |
| | Case 30 | 383 |
| | Case 31 | 383 |
| | Key Diagnostic Features | 384 |
| | Main Differential Diagnoses | 384 |

| | | |
|----------|--|------------|
| 8.14 | Adrenal Metastasis | 384 |
| | Case 32 | 384 |
| | Case 33 | 385 |
| | Case 34 | 385 |
| | Key Diagnostic Features | 385 |
| 8.15 | Primary Adrenal Lymphoma | 386 |
| | Case 35 | 386 |
| | Key Diagnostic Features | 387 |
| 8.16 | Adrenal Neuroblastoma | 387 |
| | Case 36 | 387 |
| | Case 37 | 388 |
| | Case 38 | 389 |
| | Case 39 | 390 |
| | Key Diagnostic Features | 390 |
| | References | 390 |
| 9 | Male Reproductive System: Prostate Gland, Seminal Vesicles, and Scrotum | 391 |
| 9.1 | Benign Prostate Hyperplasia | 391 |
| | Case 1 | 391 |
| | Case 2 | 392 |
| | Case 3 | 393 |
| | Key Diagnostic Features | 393 |
| 9.2 | Prostate Tuberculosis | 394 |
| | Case 4 | 394 |
| | Key Diagnostic Features | 394 |
| 9.3 | Tuberculosis of the Seminal Vesicles | 395 |
| | Case 5 | 395 |
| | Key Diagnostic Features | 395 |
| 9.4 | TB Orchitis and Epididymitis | 396 |
| | Case 6 | 396 |
| | Key Diagnostic Features | 396 |
| 9.5 | Prostate Cancer Confined in the Prostate Gland | 397 |
| | Case 7 | 397 |
| | Case 8 | 397 |
| | Case 9 | 398 |
| | Key Diagnostic Features | 398 |
| | Main Differential Diagnoses | 398 |
| 9.6 | Prostate Cancer with Extracapsular Extension | 399 |
| | Case 10 | 399 |
| | Case 11 | 399 |
| | Case 12 | 400 |
| | Case 13 | 401 |
| | Key Diagnostic Features | 402 |
| 9.7 | Prostate Cancer with Seminal Vesicle Invasion | 403 |
| | Case 14 | 403 |
| | Case 15 | 404 |
| | Key Diagnostic Features | 404 |
| | Main Differential Diagnoses | 405 |
| 9.8 | Prostate Cancer with Bladder Invasion | 406 |
| | Case 16 | 406 |
| | Case 17 | 407 |
| | Key Diagnostic Features | 407 |
| | Main Differential Diagnoses | 407 |

| | | |
|------|--|-----|
| 9.9 | Prostate Cancer with Rectal Invasion | 408 |
| | Case 18 | 408 |
| | Case 19 | 409 |
| | Key Diagnostic Features | 409 |
| 9.10 | Prostate Cancer With Osteoblastic Metastasis | 410 |
| | Case 20 | 410 |
| | Case 21 | 411 |
| | Case 22 | 412 |
| | Key Diagnostic Features | 413 |
| 9.11 | Prostate Sarcoma | 414 |
| | Case 23 | 414 |
| | Case 24 | 415 |
| | Key Diagnostic Features | 416 |
| 9.12 | Testicular Hematoma | 416 |
| | Case 25 | 416 |
| | Key Diagnostic Features | 417 |
| 9.13 | Testicular Microlithiasis | 418 |
| | Case 26 | 418 |
| | Key Diagnostic Features | 418 |
| 9.14 | Testicular Seminomas | 418 |
| | Case 27 | 418 |
| | Case 28 | 419 |
| | Case 29 | 420 |
| | Key Diagnostic Features | 420 |
| 9.15 | Testicular Non-seminomatous Mixed Germ Cell Tumors | 420 |
| | Case 30 | 420 |
| | Case 31 | 421 |
| | Case 32 | 422 |
| | Key Diagnostic Features | 422 |
| 9.16 | Testicular Teratocarcinomas | 423 |
| | Case 33 | 423 |
| | Key Diagnostic Features | 424 |
| 9.17 | Testicular Embryonal Carcinomas | 424 |
| | Case 34 | 424 |
| | Case 35 | 425 |
| | Case 36 | 425 |
| | Key Diagnostic Features | 425 |
| 9.18 | Testicular Choriocarcinoma | 426 |
| | Case 37 | 426 |
| | Key Diagnostic Features | 427 |
| 9.19 | Testicular Lymphoma | 427 |
| | Case 38 | 427 |
| | Case 39 | 428 |
| | Key Diagnostic Features | 429 |
| 9.20 | Varicocele | 429 |
| | Case 40 | 429 |
| | Case 41 | 430 |
| | Key Diagnostic Features | 430 |
| 9.21 | Paratesticular Liposarcoma | 431 |
| | Case 42 | 431 |
| | Case 43 | 433 |
| | Key Diagnostic Features | 444 |

| | | |
|-----------|---|------------|
| 9.22 | Inguinal Hernia | 435 |
| | Case 44 | 435 |
| | Case 45 | 436 |
| | Case 46 | 437 |
| | Key Diagnostic Features | 438 |
| 9.23 | Penile Carcinoma | 439 |
| | Case 47 | 439 |
| | Case 48 | 439 |
| | Key Diagnostic Features | 440 |
| 9.24 | Fournier's Gangrene | 440 |
| | Case 49 | 440 |
| | Case 50 | 441 |
| | Key Diagnostic Features | 441 |
| | References | 442 |
| 10 | Female Reproductive System | 443 |
| 10.1 | Uterine Prolapse | 443 |
| | Case 1 | 443 |
| | Key Diagnostic Features | 444 |
| 10.2 | Uterine Myomas | 444 |
| | Case 2 | 444 |
| | Case 3 | 445 |
| | Case 4 | 445 |
| | Case 5 | 446 |
| | Case 6 | 446 |
| | Key Diagnostic Features | 447 |
| 10.3 | Adenomyosis | 447 |
| | Case 7 | 447 |
| | Key Diagnostic Features | 448 |
| 10.4 | Uterine Leiomyosarcomas | 449 |
| | Case 8 | 449 |
| | Key Diagnostic Features | 451 |
| 10.5 | Endometrial Carcinoma | 451 |
| | Case 9 | 451 |
| | Case 10 | 452 |
| | Case 11 | 453 |
| | Key Diagnostic Features | 453 |
| 10.6 | Uterine Lymphoma | 454 |
| | Case 12 | 454 |
| | Key Diagnostic Features | 454 |
| 10.7 | Cervical Carcinoma | 455 |
| | Case 13 | 455 |
| | Case 14 | 456 |
| | Case 15 | 457 |
| | Key Diagnostic Features | 458 |
| 10.8 | Ovarian Endometrioma | 458 |
| | Case 16 | 458 |
| | Key Diagnostic Features | 459 |
| | Main Differential Diagnoses | 459 |
| 10.9 | Paraovarian Cyst | 460 |
| | Case 17 | 460 |
| | Key Diagnostic Features | 460 |

| | | |
|-----------|--|------------|
| 10.10 | Tubo-ovarian Abscess and Pyosalpinx | 461 |
| | Case 18 | 461 |
| | Key Diagnostic Features | 461 |
| | Main Differential Diagnosis | 461 |
| 10.11 | Ovarian Serous and Mucinous Cystadenomas | 462 |
| | Case 19 | 462 |
| | Case 20 | 463 |
| | Key Diagnostic Features | 463 |
| 10.12 | Ovarian Mature Cystic Teratoma | 464 |
| | Case 21 | 464 |
| | Case 22 | 465 |
| | Key Diagnostic Features | 465 |
| 10.13 | Ovarian Carcinoma | 466 |
| | Case 23 | 466 |
| | Case 24 | 466 |
| | Key Diagnostic Features | 467 |
| 10.14 | Krukenberg Tumor | 468 |
| | Case 25 | 468 |
| | Key Diagnostic Features | 468 |
| 10.15 | Bartholin Cyst | 469 |
| | Case 26 | 469 |
| | Key Diagnostic Features | 469 |
| 10.16 | Vaginal Melanoma | 470 |
| | Case 27 | 470 |
| | Key Diagnostic Features | 470 |
| 10.17 | Vulval Carcinoma | 471 |
| | Key Diagnostic Features | 471 |
| | References | 472 |
| 11 | Injury, Post-interventional Disease, and Blunt Trauma | 473 |
| 11.1 | Ketamine Cystitis | 473 |
| | Case 1 | 473 |
| | Key Diagnostic Features | 474 |
| 11.2 | Flank Herniation After Nephrectomy | 475 |
| | Case 2 | 475 |
| | Key Diagnostic Features | 475 |
| 11.3 | Colocutaneous Fistula After Nephrectomy | 476 |
| | Case 3 | 476 |
| | Key Diagnostic Features | 476 |
| 11.4 | Urothelial Carcinomas of the Ureteral Stump | 477 |
| | Case 4 | 477 |
| | Case 5 | 478 |
| | Key Diagnostic Features | 478 |
| 11.5 | Renal Subcapsular Hematoma After Extracorporeal Shock Wave Lithotripsy (ESWL) | 479 |
| | Case 6 | 479 |
| | Case 7 | 479 |
| | Case 8 | 480 |
| | Key Diagnostic Features | 480 |
| 11.6 | Renal Vascular Injury After Surgery or Intervention | 480 |
| | Case 9 | 480 |
| | Case 10 | 481 |
| | Case 11 | 482 |
| | Key Diagnostic Features | 482 |

| | | |
|-------|---|-----|
| 11.7 | Urine Leakage from Renal Collecting System After Renal Surgery | 483 |
| | Case 12 | 483 |
| | Case 13 | 484 |
| | Key Diagnostic Features | 484 |
| 11.8 | Iatrogenic Ureteral Trauma | 485 |
| | Case 14 | 485 |
| | Case 15 | 486 |
| | Key Diagnostic Features | 486 |
| 11.9 | Stone of Allograft Ureter | 487 |
| | Case 16 | 487 |
| | Key Diagnostic Features | 487 |
| 11.10 | Bladder Rupture After Transurethral Resection of the Bladder Tumor (TURBT) | 488 |
| | Case 17 | 488 |
| | Case 18 | 488 |
| | Key Diagnostic Features | 488 |
| 11.11 | Irradiation Cystitis | 489 |
| | Case 19 | 489 |
| | Key Diagnostic Features | 489 |
| 11.12 | Urinary Stones in Ileal Conduit | 490 |
| | Case 20 | 490 |
| | Key Diagnostic Features | 491 |
| 11.13 | Vesicourethral Leak After Prostatectomy | 492 |
| | Case 21 | 492 |
| | Key Diagnostic Features | 492 |
| 11.14 | Vesicovaginal Fistula | 493 |
| | Case 22 | 493 |
| | Case 23 | 494 |
| | Key Diagnostic Features | 495 |
| 11.15 | Recurrent Cervical Cancer After Hysterectomy | 496 |
| | Case 24 | 496 |
| | Case 25 | 497 |
| | Key Diagnostic Features | 497 |
| 11.16 | Intrauterine Device (IUD) Migration | 498 |
| | Case 26 | 498 |
| | Key Diagnostic Features | 498 |
| 11.17 | Transurethral Resection of the Prostate (TURP) | 499 |
| | Case 27 | 499 |
| | Case 28 | 499 |
| | Key Diagnostic Features | 499 |
| 11.18 | Local Recurrence of Prostate Cancer After Radical Prostatectomy | 500 |
| | Case 29 | 500 |
| | Case 30 | 501 |
| | Key Diagnostic Features | 501 |
| 11.19 | Blunt Renal Injury | 502 |
| | Case 31 | 502 |
| | Case 32 | 502 |
| | Case 33 | 503 |
| | Case 34 | 503 |
| | Case 35 | 504 |
| | Case 36 | 504 |
| | Key Diagnostic Features | 505 |

- [read online How to Draw Anime & Game Characters, Volume 1: Basics for Beginners and Beyond](#)
- [click The Lazarus Machine \(Tweed & Nightingale Adventure, Book 1\) for free](#)
- [download online Feet on the Street: Rambles Around New Orleans \(Crown Journeys\)](#)
- [Cows for Kids, Cow Fun and Facts book](#)
- [Personality Politics?: The Role of Leader Evaluations in Democratic Elections online](#)

- <http://yachtwebsitedemo.com/books/How-to-Draw-Anime---Game-Characters--Volume-1--Basics-for-Beginners-and-Beyond.pdf>
- <http://www.satilik-kopek.com/library/Political-Communication-in-Britain--The-Leader-s-Debates--the-Campaign-and-the-Media-in-the-2010-General-Electi>
- <http://www.shreesaiexport.com/library/Bad-Bites--Donut-Shop-Mystery--Book-16-.pdf>
- <http://www.freightunlocked.co.uk/lib/Cows-for-Kids--Cow-Fun-and-Facts.pdf>
- <http://yachtwebsitedemo.com/books/Mao--A-Very-Short-Introduction--Very-Short-Introductions-.pdf>