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Editors

Tumors and Tumor-Like Lesions of Bone

Second Edition

 Springer

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The medical editors, Yong-Koo Park, Franco Bertoni, Eduardo Santini-Araujo and Ricardo K. Kalil

Besides our mentors and families, this second edition pays a special tribute to our coeditor and exceptional friend, Eduardo Hector Santini-Araujo, and to Romulo Cabrini, his lifetime friend and mentor, who both died during the revision of this second edition.

Our mentors

Fritz Schajowicz and David Dahlin, two giants of orthopedic pathology, stand behind us all.

K. Krishnan Unni, whose experience, knowledge, charisma, and leadership influenced all of us, being tireless and obstinate in his long-lasting support and incentive through several years.

To them, we would like to add those people who highly influenced our choices and development in pathology, especially R. L. Cabrini.

Our families

*Wife, Romina, and sons and daughters, Maria Gala, Martina, Julian, Pedro
Ferreol, and Margarita*

E. Santini-Araujo

*Wife, Angela, and daughter, sons, and stepsons, Luciana, Sergio, Marcelo,
Marcio, and Mateus*

R. K. Kalil

My beloved family

F. Bertoni

*My parents; wife, Dan-Young; son, Byung-Chul; and daughter, Ko-Un
To them, our endless love.*

Y-K Park

Foreword to the Second Edition

This new edition is devoted to the memory of Dr. Eduardo Santini Araujo (1953–2017).

The first edition of this book gained general acceptance among specialists in bone tumors and related lesions, representing as it did the continuity of the “classic” book on bone tumors edited by Fritz Schajowicz (*Histopathological Typing of Bone Tumors*, 1993), published by Springer Verlag, and became an indispensable tool for diagnostic histopathologists all over the world.

This new second edition, published only 4 years after the first, provides an updated text with a number of new topics and new chapters. It represents a complete renovation and extension of the former edition.

This new edition maintains the philosophy of its predecessor but has been adapted to meet the new challenges in the clinical and histological diagnosis of frequent and more particularly infrequent tumors, providing insights into therapeutic approaches and their prognostic outcome.

As was already indicated in the first edition, recent innovations in the clinical approach to bone tumors, thanks to the new diagnostic imaging techniques that complement conventional radiology with SCAN, PET, and MR, alone or in combination, have provided a much more precise diagnostic identification of each tumor entity. Furthermore, the microscopic phenotyping of tumors and tumor-like lesions is more efficient based upon the use of fine needle aspiration cytology, a technique that requires a profound knowledge of tissue at the histological level and a good understanding of bone tumor biology. Moreover, histopathology has been enhanced by new methodological techniques, such as electron microscopy and immunohistochemistry, offering the surgical pathologist unforeseen possibilities for more accurate differential diagnosis of borderline lesions or doubtful histological tumor types.

Nevertheless, the handling of bone tumors still requires a high degree of specialization for all those involved in this pathology, as well as demanding cooperation between all specialists.

Bone tumors are not exclusively age-based, nor particularly anatomically related; thus, pediatric and adult orthopedists are frequently involved in simultaneous consultations, which is also the case for radiologists and oncologists. This affects the surgical pathologist who needs highly specific training in the field and a case-by-case analysis of each patient in close cooperation with their clinical colleagues. In this setting, one of the major aims of the present book is to provide the informative doctrine needed for this end.

This new edition maintains the philosophy of the first edition, and, since time is precious for everyone especially when trying to acquire new knowledge in a particular field or looking for a precise diagnosis, clearly explained concepts in a short, readable, informative format are required. This approach has been followed by each author, thus providing a clear structure to each chapter. Long academic case discussions and details on etiopathological analysis are avoided, compiling concise information on the most up-to-date publications available.

Of course, no book today can cover all the available literature on a given field or for a particular tumor type but should, as in this new edition of the book on bone tumors, contain the most relevant data to facilitate the best practical clinical handling of the patient’s pathology.

The present book aims to cover the main topics with a dynamic approach to the diagnosis of bone tumors, placing the histopathologist at the center of the game, performing both cytology and histology, and working in close cooperation with the radiologist and the orthopedic surgeon. Nevertheless, the clinical orthopedist and oncologist need to be aware of the difficulty of some cases in which the true nature of the process is unpredictable or the final diagnosis cannot be established with absolute precision. Therefore, each chapter provides clues for the differential diagnosis to help in clarifying the tumor type.

Currently, new advances in the molecular biology of cancer are attracting particular attention, particularly in bone disease and bone tumors. Updated information has been included in this new edition with particular attention devoted to this field and the practical applications oriented toward differential diagnosis and prognosis. This is a completely new field, not generally covered by other books on bone tumors.

This new edition coincides with the passing away of one of its main editors, Dr. Eduardo Santini-Araujo, who was the soul of the book from the very beginning. Even when affected with a metastatic carcinoma, he continued with the revision of this second edition, which was finished only a few days before his death. Dr. Ricardo Kalil fulfilled the task of completing this new version, accompanying his dear friend Eduardo on his deathbed.

The present book is the collaborative cooperation by numerous highly distinguished bone and osteoarticular pathologists, under the outstanding guidance of the four main editors: the late Dr. Eduardo Santini-Araujo (Argentina), together with Ricardo K. Kalil (Brazil), Franco Bertoni (Italy), and Yong-Koo Park (Republic of Korea). All are well known in their fields and their multiple contributions to the literature of bone pathology reinforce the high quality not only of their own chapters but also of the ample selection of coauthors heading each chapter. Many of these authors are leaders in their fields, and they provide seminal and novel information in a clear and practical format in which not only high-quality histological images exemplify each chapter but also excellent renewed diagnostic illustrations complement the comprehensive overview of the patient pathology in which major clinical insights are also provided.

Special thanks go to all colleagues, editors, and individual authors for having agreed to continue participating in this new edition, adding their admirable expertise to the work. In this context, we wish to extend our warmest appreciation to them.

Once again, our appreciation for the task performed in this new edition by Springer in maintaining the high quality of the book and also in accepting the additional costs involved in producing the comprehensive iconography considered necessary by all four editors to attain the level of excellence and utility of this book.

December 2018

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Preface to the First Edition

The overall intention of this book is to provide day-to-day assistance in tumors and tumor-like lesions of bone, for general surgical pathologists, radiologists, and orthopedic surgeons, with practical image diagnosis, histopathological and molecular diagnosis, and basic therapeutic guidelines.

Our main objective is to provide the essential information that any orthopedic surgeon, radiologist, and surgical pathologist, whether general or specialized, in practice or training, needs for evaluating a patient with a lesion in the area of orthopedic pathology.

The philosophy of the book is to offer generous coverage of epidemiology, clinical features, radiology, pathology, and differential diagnosis not only for the distribution of the statistical average of the lesion's features but also to illustrate the standard deviations, including the clues in the images and histopathology needed to arrive at a sharp differential diagnosis.

To achieve this goal, we gathered a selected team of the more experienced and knowledgeable people in this field in the world, in pathology, imaging diagnosis, and oncologic orthopedic surgery, and who, generously, made available their unsurpassed expertise in order to make this a most valuable tool for the practical diagnosis of tumors and tumor-like lesions of the bone.

Buenos Aires, Argentina
São Paulo, SP, Brazil
Bologna, Italy
Seoul, Republic of Korea

Eduardo Santini-Araujo
Ricardo K. Kalil
Franco Bertoni
Yong-Koo Park

Preface to the Second Edition

In this second edition, some new and important improvements were made, and we point out the inclusion of a new section on joint tumors. Also, new collaborators add exceptional quality to the book, with some chapters, like the vascular tumors section, having been completely rewritten. With few exceptions, all other chapters were updated, especially with respect to new genetic developments.

New chapters include the clinical approach to bone and joint tumors and, owing to the importance of osteosarcoma to this field, the clinical oncologic approach to this frequent malignant tumor.

Due to the scarcity of new publications on tumors of the jaws, we had initially included a new and complete section dedicated to this field, but, owing to the passing away of its main author, Prof. Romulo Cabrini, taking with him his massive knowledge in the field, we decided to cancel it.

The task of editing this edition was made harder by the passing away of another important author and medical editor, Prof. Eduardo Santini-Araujo, in the middle of the work of editing. Fortunately, for the remaining editors, he was able to review and update all the chapters under his personal authorship in time. Nevertheless, the absence of his energetic figure and exceptional drive was deeply felt in the final effort to finish this second edition.

Also fortunate was to count on the extremely competent job of the Springer editing team led by Lee Klein, whom we thank for the permanent availability and advice during the making of this edition.

São Paulo, SP, Brazil
Bologna, Italy
Seoul, Republic of Korea

Ricardo K. Kalil
Franco Bertoni
Yong-Koo Park

Contents

Part I Introduction

1 Practical Approach to the Diagnosis of Bone Tumors	3
Eduardo Zambrano and K. Krishnan Unni	
1.1 Clinical Features	3
1.2 Roentgenographic Findings	3
1.3 Classification	3
1.3.1 Classification Scheme	3
1.4 Gross Examination	5
1.5 Grading and Staging	7
Suggested Reading	7
2 Special Clinical Aspects of Certain Bone Tumors and Tumor-Like Lesions	9
Francisco Azzato and Silvia Ferrandini	
2.1 Introduction	9
2.2 Reason for Consultation	9
2.3 The Tumor	9
2.3.1 Age of Presentation	9
2.3.2 Tumor Location	9
2.3.3 Tumor Behavior	10
2.4 Complementary Tests	10
2.4.1 CT Scans	10
2.4.2 MRI	10
2.4.3 Bone Scan	11
2.4.4 PET/CT	11
2.4.5 Angiography	11
2.4.6 Laboratory Tests	11
2.5 Preneoplastic Lesions	11
Suggested Reading	11
3 An Imaging Approach to Bone Tumors	13
Darlene M. Holden, Hakan Ilaslan, and Murali Sundaram	
3.1 Imaging Modalities	14
3.1.1 Radiographs	14
3.1.2 Computed Tomography	15
3.1.3 Magnetic Resonance Imaging	15
3.1.4 Bone Scintigraphy	16
3.1.5 Positron Emission Tomography–Computed Tomography	16
3.1.6 Positron Emission Tomography–Magnetic Resonance Imaging	16
3.2 Imaging for Staging and Biopsy	16
3.2.1 Staging	16
3.2.2 Image-Guided Biopsy	16
3.2.3 Image-Guided Treatments	17

3.3	Characteristically Benign Lesions	17
3.3.1	Nonossifying Fibroma	18
3.3.2	Fibrous Dysplasia.	18
3.3.3	Enchondroma.	20
3.3.4	Paget's Disease.	21
3.4	Osteogenic Lesions	26
3.4.1	Osteoid Osteoma	26
3.4.2	Osteblastoma	29
3.4.3	Osteosarcoma.	29
3.5	Cartilage Tumors	36
3.5.1	Osteochondroma	36
3.5.2	Periosteal Chondroma	39
3.5.3	Chondroblastoma	39
3.5.4	Chondromyxoid Fibroma.	41
3.5.5	Chondrosarcoma	41
3.5.6	Dedifferentiated Chondrosarcoma	44
3.5.7	Periosteal Chondrosarcoma	44
3.6	Notochordal Tumors	44
3.6.1	Chordoma.	44
3.6.2	Benign Notochordal Cell Tumor	46
3.7	Ewing Sarcoma	47
3.8	Malignant Fibrohistiocytic Tumor	47
3.9	Osteoclastic Giant Cell–Rich Tumors	49
3.9.1	Giant Cell Tumor	49
3.9.2	Giant Cell Reparative Granuloma	50
3.10	Miscellaneous Tumors	50
3.10.1	Unicameral Bone Cyst.	50
3.10.2	Aneurysmal Bone Cyst	51
3.10.3	Langerhans Cell Histiocytosis	52
3.10.4	Adamantinoma.	53
3.10.5	Osteofibrous Dysplasia	55
3.10.6	Bizarre Parosteal Osteochondromatous Proliferation	56
	References.	57
4	Methods of Bone Biopsy	61
	Eduardo Santini-Araujo, Isabela W. da Cunha, Blas Dios, Rómulo L. Cabrini, and Ricardo K. Kalil	
4.1	Introduction	61
4.2	Surgical Biopsy	61
4.2.1	Intraoperative Biopsy.	62
4.2.2	Paraffin-Embedded Sections	62
4.3	Needle Biopsy (Fine Needle or Trocar Biopsy).	62
4.3.1	Types of Devices	62
4.3.2	Anesthesia and Imaging.	62
4.3.3	Fine Needle Aspiration Biopsy	62
4.3.4	Core Needle Biopsy	65
4.3.5	Coaxial Technique	65
4.3.6	Accuracy and Advantages of Percutaneous Needle Biopsy.	65
4.4	Biopsy for Molecular Studies	68
4.5	Tomographic Classification of Bone Lesions for Planning of CT-Guided Needle Biopsy	70
4.6	Important Concepts and Conclusions	77
	References.	77

5 Basic and Ancillary Techniques in Bone Pathology	79
Kiyong Na and Yong-Koo Park	
5.1 Basic Technique	79
5.2 Histochemistry	79
5.3 Electron Microscopy	79
5.4 Flow Cytometry	80
5.5 Histomorphometry of Undecalcified Bone	80
5.6 Immunohistochemistry	80
5.7 Karyotyping	81
5.8 Blotting	82
5.8.1 Southern Blot	82
5.8.2 Northern Blot	82
5.8.3 Western Blot	82
5.8.4 Dot Blot	82
5.9 Polymerase Chain Reaction (PCR) and Real-Time PCR	83
5.9.1 PCR	83
5.9.2 Real-Time PCR	84
5.10 In Situ Hybridization	84
5.10.1 Fluorescence In Situ Hybridization (FISH)	84
5.10.2 Chromogenic In Situ Hybridization (CISH)	85
5.10.3 Silver In Situ Hybridization (SISH)	86
5.11 Comparative Genomic Hybridization and Chromothripsis	86
5.11.1 Comparative Genomic Hybridization	86
5.11.2 Chromothripsis	86
5.12 DNA Microarray	87
5.12.1 Application of Microarray	87
5.13 Next Generation Sequencing (NGS)	88
Reference	88
6 Grading and Staging	91
Kiyong Na and Yong-Koo Park	
6.1 Grading of Bone Tumors	91
6.1.1 Osteosarcoma	91
6.1.2 Chondrosarcoma	91
6.1.3 Other Bone Tumors	91
6.2 Staging of Musculoskeletal Neoplasms	92
Suggested Reading	93
7 Systemic Treatment of Conventional High-Grade Osteosarcoma	95
Celso Abdon Lopes de Mello	
7.1 Introduction	95
7.2 Preoperative Versus Postoperative Chemotherapy	95
7.3 Alternative Postoperative Chemotherapy for Poor Response	96
7.4 Intensification of Preoperative Chemotherapy Regimens	97
7.5 Systemic Therapy for Older Patients	98
7.6 Treatment for Relapsed Disease	99
Suggested Reading	100
8 Surgical Treatment of Tumors and Tumor-Like Lesions of Bone	103
Brian E. Walczak, Peter S. Rose, Joel M. Post, and Franklin H. Sim	
8.1 Introduction	103
8.2 Biopsy	103
8.3 Amputation (Limb-Sacrificing Surgery)	104
8.4 Limb Salvage (Limb-Sparing Resection)	105
8.4.1 Surgical Margins	105

8.5	Special Considerations	110
8.5.1	Pelvic Lesions	110
8.5.2	Spine Lesions	114
8.5.3	Shoulder Girdle Lesions	116
8.5.4	Periarticular Lesions	116
8.6	Conclusions	118
	References	118

Part II Bone-forming Tumors

9	Medullary Osteoma	123
	Liliana G. Olvi, Gustavo M. Lembo, Eduardo Santini-Araujo, and Ricardo K. Kalil	
9.1	Definition	123
9.2	Synonyms	123
9.3	Etiology	123
9.4	Epidemiology	123
9.5	Sites of Involvement	123
9.6	Clinical Symptoms and Signs	123
9.7	Imaging Features	123
9.7.1	Radiographic Features	123
9.7.2	CT Features	124
9.7.3	MRI Features	124
9.7.4	Bone Scan Features	129
9.8	Imaging Differential Diagnosis (for Large Lesions)	129
9.9	Pathology	129
9.9.1	Gross Features	129
9.9.2	Histological Features	129
9.9.3	Pathologic Differential Diagnosis	129
9.10	Prognosis	129
9.11	Treatment	130
	Suggested Reading	130
10	Parosteal Osteoma	131
	Liliana G. Olvi, Gustavo M. Lembo, Eduardo Santini-Araujo, and Ricardo K. Kalil	
10.1	Definition	131
10.2	Synonyms	131
10.3	Etiology	131
10.4	Epidemiology	131
10.5	Sites of Involvement	131
10.6	Clinical Symptoms and Signs	131
10.7	Imaging Features	132
10.7.1	Radiographic Features	132
10.7.2	CT Features	133
10.7.3	MRI Features	135
10.7.4	Bone Scan Features	135
10.8	Imaging Differential Diagnosis	135
10.9	Pathology	136
10.9.1	Gross Features	136
10.9.2	Histological Features	136
10.9.3	Pathologic Differential Diagnosis	136
10.10	Prognosis	137
10.11	Treatment	137
	Suggested Reading	137

11 Osteoid Osteoma	139
Liliana G. Olvi, Gustavo M. Lembo, Eduardo Santini-Araujo, and Ricardo K. Kalil	
11.1 Definition	139
11.2 Synonyms	139
11.3 Etiology	139
11.4 Epidemiology	139
11.5 Sites of Involvement	139
11.6 Clinical Symptoms and Signs	139
11.7 Imaging Features	140
11.7.1 Radiographic Features	140
11.7.2 CT Features	141
11.7.3 MRI Features	141
11.7.4 Bone Scan Features	144
11.8 Imaging Differential Diagnosis	144
11.9 Pathology	145
11.9.1 Gross Features	145
11.9.2 Histological Features	145
11.9.3 Pathologic Differential Diagnosis	149
11.9.4 Ancillary Techniques	151
11.10 Prognosis	151
11.11 Treatment	151
Suggested Reading	160
12 Osteoblastoma	161
Liliana G. Olvi, Gustavo M. Lembo, Osvaldo Velan, Eduardo Santini-Araujo, and Ricardo K. Kalil	
12.1 Definition	161
12.2 Synonyms	161
12.3 Etiology	161
12.4 Epidemiology	161
12.5 Sites of Involvement	161
12.6 Clinical Symptoms and Signs	161
12.7 Imaging Features	162
12.7.1 Radiographic Features	162
12.7.2 CT Features	162
12.7.3 MRI Features	162
12.7.4 Bone Scan Features	162
12.8 Imaging Differential Diagnosis	164
12.9 Pathology	165
12.9.1 Gross Features	165
12.9.2 Histological Features	165
12.9.3 Pathologic Differential Diagnosis	172
12.9.4 Genetics	180
12.10 Prognosis	180
12.11 Treatment	181
Suggested Reading	181
13 Conventional Central Osteosarcoma	183
Franco Bertoni, Jodi M. Carter, and Patrizia Bacchini	
13.1 Conventional Central Osteosarcoma	183
13.1.1 Definition	183
13.1.2 Synonyms	183
13.1.3 Etiology	183
13.1.4 Clinical Features	183

13.1.5	Image Diagnosis	184
13.1.6	Pathology	186
13.1.7	Prognosis	202
13.1.8	Treatment	203
13.2	Low-Grade Central Osteosarcoma (LGCOS)	205
13.2.1	Definition	205
13.2.2	Etiology	205
13.2.3	Clinical Features	205
13.2.4	Image Diagnosis	205
13.2.5	Pathology	206
13.2.6	Prognosis	209
13.2.7	Treatment	209
	Suggested Reading	209
14	Osteosarcoma of the Jaws	211
	María L. Paparella and Rómulo L. Cabrini	
14.1	Definition	211
14.2	Synonyms	211
14.3	Etiology	211
14.4	Epidemiology	211
14.5	Sites of Involvement	211
14.6	Clinical Symptoms and Signs	211
14.7	Imaging Features	211
14.8	Pathology	213
14.8.1	Gross Features	213
14.8.2	Histopathological Features	213
14.9	Pathological Differential Diagnosis	213
14.10	Prognosis	215
14.11	Treatment	216
	Suggested Reading	221
15	Parosteal Osteosarcoma	223
	Carrie Y. Inwards and Doris E. Wenger	
15.1	Definition	223
15.2	Synonyms	223
15.3	Etiology	223
15.4	Epidemiology	223
15.5	Sites of Involvement	223
15.6	Clinical Signs and Symptoms	223
15.7	Imaging Features	223
15.7.1	Radiographic Features	223
15.7.2	CT Features	223
15.7.3	MRI Features	225
15.7.4	Bone Scan Features	225
15.8	Imaging Differential Diagnosis	225
15.9	Pathology	227
15.9.1	Gross Features	227
15.9.2	Histological Features	227
15.10	Pathologic Differential Diagnosis	230
15.11	Ancillary Studies	230
15.11.1	Immunohistochemistry	230
15.11.2	Genetics	230
15.12	Prognosis	230
15.13	Treatment	230
	Suggested Reading	230

16 Periosteal Osteosarcoma	233
Carrie Y. Inwards and Doris E. Wenger	
16.1 Definition	233
16.2 Synonyms	233
16.3 Etiology	233
16.4 Epidemiology	233
16.5 Sites of Involvement	233
16.6 Clinical Signs and Symptoms	233
16.7 Imaging Features	233
16.7.1 Radiographic Features	233
16.7.2 CT Features	234
16.7.3 MRI Features	234
16.7.4 Bone Scan Features	235
16.8 Imaging Differential Diagnosis	235
16.9 Pathology	236
16.9.1 Gross Features	236
16.9.2 Histological Features	236
16.10 Pathologic Differential Diagnosis	238
16.11 Ancillary Studies	238
16.11.1 Genetics	238
16.12 Prognosis	238
16.13 Treatment	238
Suggested Reading	239
17 High-Grade Surface Osteosarcoma	241
Carrie Y. Inwards and Doris E. Wenger	
17.1 Definition	241
17.2 Synonyms	241
17.3 Etiology	241
17.4 Clinical Features	241
17.4.1 Epidemiology	241
17.4.2 Sex	241
17.4.3 Age	241
17.4.4 Sites of Involvement	241
17.4.5 Clinical Signs and Symptoms	241
17.5 Image Diagnosis	241
17.5.1 Radiographic Features	241
17.5.2 CT Features	241
17.5.3 MRI Features	243
17.5.4 Bone Scan	243
17.6 Imaging Differential Diagnosis	243
17.7 Pathology	243
17.7.1 Gross Features	243
17.7.2 Histological Features	243
17.7.3 Histologic Differential Diagnosis	243
17.8 Genetics	244
17.9 Prognosis	244
17.10 Treatment	244
Suggested Reading	244
Part III Cartilage-forming Tumors	
18 Enchondroma	247
Kiyong Na and Yong-Koo Park	
18.1 Definition	247
18.2 Synonyms	247

18.3	Etiology	247
18.4	Epidemiology	247
18.5	Sites of Involvement	247
18.6	Clinical Symptoms and Signs	247
18.7	Imaging Features	247
18.7.1	Radiographic Features	247
18.7.2	CT Features	248
18.7.3	MRI Features	248
18.8	Imaging Differential Diagnosis	248
18.9	Pathology	249
18.9.1	Gross Features	249
18.9.2	Histological Features	250
18.9.3	Pathologic Differential Diagnosis	250
18.9.4	Ancillary Techniques	251
18.10	Prognosis	254
18.11	Treatment	254
	Suggested Reading	254
19	Multiple Enchondromatosis (Ollier's Disease)	257
	Kiyong Na and Yong-Koo Park	
19.1	Definition	257
19.2	Synonyms	257
19.3	Etiology	257
19.4	Epidemiology	257
19.5	Sites of Involvement	257
19.6	Clinical Symptoms and Signs	257
19.7	Imaging Features	257
19.8	Imaging Differential Diagnosis	260
19.9	Pathology	260
19.9.1	Gross Features	260
19.9.2	Histological Features	260
19.9.3	Pathologic Differential Diagnosis	260
19.9.4	Ancillary Techniques	260
19.10	Prognosis	261
19.11	Treatment	261
	Suggested Reading	265
20	Periosteal Chondroma	267
	Kiyong Na and Yong-Koo Park	
20.1	Definition	267
20.2	Synonyms	267
20.3	Etiology	267
20.4	Epidemiology	267
20.5	Sites of Involvement	267
20.6	Clinical Symptoms and Signs	267
20.7	Imaging Features	267
20.7.1	Radiographic Features	267
20.7.2	CT Features	267
20.7.3	MRI Features	268
20.8	Imaging Differential Diagnosis	268
20.9	Pathology	268
20.9.1	Gross Features	268
20.9.2	Histological Features	269
20.9.3	Pathologic Differential Diagnosis	271
20.9.4	Ancillary Techniques	272

20.10	Prognosis	272
20.11	Treatment	272
	Suggested Reading	272
21	Osteochondroma	273
	Kiyong Na and Yong-Koo Park	
21.1	Definition	273
21.2	Synonyms	273
21.3	Etiology	273
21.4	Epidemiology	273
21.5	Sites of Involvement	273
21.6	Clinical Symptoms and Signs	273
21.7	Imaging Features	274
21.8	Imaging Differential Diagnosis	275
21.9	Pathology	276
21.9.1	Gross Features	276
21.9.2	Histological Features	276
21.9.3	Pathologic Differential Diagnosis	278
21.9.4	Ancillary Techniques	278
21.10	Prognosis	278
21.11	Treatment	282
	Suggested Reading	282
22	Multiple Osteochondromatosis	283
	Kiyong Na and Yong-Koo Park	
22.1	Definition	283
22.2	Synonyms	283
22.3	Etiology	283
22.4	Epidemiology	283
22.5	Sites of Involvement	283
22.6	Clinical Symptoms and Signs	283
22.7	Imaging Features	284
22.8	Pathology	284
22.8.1	Gross and Histologic Features	284
22.8.2	Ancillary Techniques	284
22.9	Prognosis	285
22.10	Treatment	285
	Suggested Reading	292
23	Chondroblastoma	293
	Kiyong Na and Yong-Koo Park	
23.1	Definition	293
23.2	Synonyms	293
23.3	Etiology	293
23.4	Epidemiology	293
23.5	Sites of Involvement	293
23.6	Clinical Symptoms and Signs	294
23.7	Imaging Features	294
23.7.1	Radiographic Features	294
23.7.2	CT Features	294
23.7.3	MRI Features	295
23.8	Imaging Differential Diagnosis	295
23.9	Pathology	295
23.9.1	Gross Features	295
23.9.2	Histological Features	295

23.9.3	Pathologic Differential Diagnosis	297
23.9.4	Ancillary Techniques	298
23.10	Prognosis	302
23.11	Treatment	302
	Suggested Reading	302
24	Chondromyxoid Fibroma	305
	Kiyong Na and Yong-Koo Park	
24.1	Definition	305
24.2	Synonyms	305
24.3	Epidemiology	305
24.4	Sites of Involvement	305
24.5	Clinical Symptoms and Signs	305
24.6	Imaging Features	305
24.6.1	Radiographic Features	305
24.6.2	CT Features	306
24.6.3	MRI Features	308
24.7	Imaging Differential Diagnosis	308
24.8	Pathology	308
24.8.1	Gross Features	308
24.8.2	Histological Features	309
24.8.3	Pathology Differential Diagnosis	310
24.8.4	Ancillary Techniques	313
24.9	Prognosis	314
24.10	Treatment	314
	Suggested Reading	314
25	Chondrosarcoma	317
	Sergio Piña-Oviedo, Jae Y. Ro, and Alberto G. Ayala	
25.1	Primary Chondrosarcoma	318
25.1.1	Conventional Intramedullary Chondrosarcoma	318
25.1.2	Periosteal (Juxtacortical) Chondrosarcoma	339
25.2	Secondary Chondrosarcoma	342
25.2.1	Secondary Peripheral Chondrosarcoma	342
25.2.2	Secondary Central Chondrosarcoma	347
	References	348
26	Chondrosarcoma Variants	353
	Kiyong Na and Yong-Koo Park	
26.1	Dedifferentiated Chondrosarcoma	353
26.1.1	Definition	353
26.1.2	Etiology	353
26.1.3	Epidemiology	353
26.1.4	Sites of Involvement	353
26.1.5	Clinical Symptoms and Signs	353
26.1.6	Imaging Features	354
26.1.7	Imaging Differential Diagnosis	354
26.1.8	Pathology	354
26.1.9	Pathologic Differential Diagnosis	354
26.1.10	Ancillary Techniques	357
26.1.11	Prognosis	360
26.1.12	Treatment	360
26.2	Mesenchymal Chondrosarcoma	360
26.2.1	Definition	360
26.2.2	Etiology	360

26.2.3	Epidemiology	360
26.2.4	Sites of Involvement	360
26.2.5	Clinical Symptoms and Signs	360
26.2.6	Imaging Features	360
26.2.7	Imaging Differential Diagnosis	361
26.2.8	Pathology	361
26.2.9	Pathologic Differential Diagnosis	361
26.2.10	Ancillary Techniques	362
26.2.11	Prognosis	363
26.2.12	Treatment	364
26.3	Clear Cell Chondrosarcoma	364
26.3.1	Definition	365
26.3.2	Etiology	365
26.3.3	Epidemiology	365
26.3.4	Sites of Involvement	365
26.3.5	Clinical Symptoms and Signs	365
26.3.6	Imaging Features	366
26.3.7	Imaging Differential Diagnosis	366
26.3.8	Pathology	367
26.3.9	Pathologic Differential Diagnosis	368
26.3.10	Ancillary Techniques	368
26.3.11	Prognosis	372
26.3.12	Treatment	372
	References	374
Part IV Giant Cell Tumor		
27	Giant Cell Tumor of Bone	381
	Ricardo K. Kalil and Fernanda Amary	
27.1	Definition	381
27.2	Synonyms	381
27.3	Etiology	381
27.4	Epidemiology	381
27.5	Sites of Involvement	381
27.6	Clinical Symptoms and Signs	382
27.7	Image Diagnosis	382
27.7.1	Radiographic Features	382
27.7.2	CT Features	383
27.7.3	MRI Features	383
27.7.4	Image Differential Diagnosis	383
27.8	Pathology	384
27.8.1	Gross Features	384
27.8.2	Histological Features	385
27.8.3	Pathology Differential Diagnosis	386
27.8.4	Ancillary Techniques	387
27.9	Prognosis	388
27.10	Treatment	389
	Suggested Reading	396
Part V Round Cell Tumors		
28	Ewing's Sarcoma Family of Tumors	401
	Isidro Machado and Antonio Llombart-Bosch	
28.1	Definition	401
28.2	Synonyms	401

28.3	Etiology	401
28.4	Epidemiology	401
28.5	Sites of Involvement	401
28.6	Clinical Symptoms and Signs	401
28.7	Imaging Features	402
	28.7.1 Radiographic Features	402
	28.7.2 CT Features	402
	28.7.3 MRI Features	402
	28.7.4 Bone Scan	403
28.8	Imaging Differential Diagnosis	403
28.9	Pathology	403
	28.9.1 Gross Features	403
	28.9.2 Histological Features	403
28.10	Ancillary Techniques	404
	28.10.1 Immunohistochemistry	404
	28.10.2 Ultrastructure	404
	28.10.3 Molecular Biology	405
28.11	Pathologic Differential Diagnosis	405
28.12	Prognosis	414
28.13	Treatment	414
	Suggested Reading	414
29	Lymphoma of Bone	417
	S. Fiona Bonar	
29.1	Definition	417
29.2	Synonyms	417
29.3	Etiology	417
29.4	Epidemiology	417
29.5	Sites of Involvement	417
29.6	Clinical Signs and Symptoms	417
29.7	Imaging Features	418
	29.7.1 Radiographic Features	418
	29.7.2 CT, PET, and Bone Scan Findings	421
	29.7.3 MRI Features	421
29.8	Imaging Differential Diagnosis	426
29.9	Pathology	427
	29.9.1 Gross Features	427
	29.9.2 Histopathology	428
	29.9.3 Cytological Findings	431
	29.9.4 Ancillary Techniques	431
	29.9.5 Pathological Differential Diagnosis	434
29.10	Prognosis	437
29.11	Treatment	437
	Suggested Reading	437
30	Myeloma	439
	Michael J. Klein	
30.1	Definition	439
30.2	Synonyms	439
30.3	Etiology	439
30.4	Epidemiology	440
30.5	Sites of Involvement	440
30.6	Clinical Symptoms and Signs	440
30.7	Imaging Diagnosis	440
	30.7.1 Radiographic Features	440

30.7.2	CT Features	440
30.7.3	MRI Features	440
30.8	Imaging Differential Diagnosis	441
30.9	Pathology	441
30.9.1	Gross Features	441
30.9.2	Histologic Features.	442
30.9.3	Pathologic Differential Diagnosis	443
30.10	Prognosis	444
30.11	Treatment	444
	Suggested Reading	448
Part VI Fibrous Tumors		
31	Desmoplastic Fibroma of Bone	451
	Ricardo K. Kalil	
31.1	Definition	451
31.2	Synonyms.	451
31.3	Etiology	451
31.4	Epidemiology.	451
31.5	Sites of Involvement.	451
31.6	Clinical Symptoms and Signs	451
31.7	Imaging Features	451
31.7.1	Radiographic Features	451
31.7.2	CT Features	451
31.7.3	MRI Features	452
31.8	Imaging Differential Diagnosis	452
31.9	Pathology	453
31.9.1	Gross Features	453
31.9.2	Histological Features	453
31.10	Pathologic Differential Diagnosis	456
31.11	Ancillary Techniques	456
31.11.1	Genetics	456
31.12	Prognosis	456
31.13	Treatment	456
	Suggested Reading	456
32	Fibrosarcoma of Bone.	459
	Ricardo K. Kalil	
32.1	Definition	459
32.2	Synonyms.	459
32.3	Etiology	459
32.4	Epidemiology.	459
32.5	Sites of Involvement.	459
32.6	Clinical Symptoms and Signs	459
32.7	Imaging Features	459
32.7.1	Radiographic and CT Features.	459
32.8	Imaging Differential Diagnosis	460
32.9	Pathology	461
32.9.1	Gross Features	461
32.9.2	Histological Features	461
32.10	Pathologic Differential Diagnosis	462
32.11	Ancillary Techniques	462
32.11.1	Genetics	462
32.12	Prognosis	463
32.13	Treatment	463
	Suggested Reading	463

Part VII Tumors of Undetermined Origin

33 Benign Fibrous Histiocytoma of Bone	467
Ricardo K. Kalil	
33.1 Definition	467
33.2 Synonyms	467
33.3 Etiology	467
33.4 Epidemiology	467
33.5 Sites of Involvement	467
33.6 Clinical Symptoms and Signs	467
33.7 Imaging Features	467
33.7.1 Radiographic Features	467
33.7.2 CT Features	467
33.7.3 MRI Features	468
33.8 Imaging Differential Diagnosis	468
33.9 Pathology	468
33.9.1 Gross Features	468
33.9.2 Histological Features	468
33.10 Pathologic Differential Diagnosis	470
33.11 Prognosis	471
33.12 Treatment	471
Suggested Reading	471
34 Undifferentiated Pleomorphic Sarcoma of Bone	473
Ricardo K. Kalil	
34.1 Definition	473
34.2 Synonyms	473
34.3 Etiology	473
34.4 Epidemiology	473
34.5 Sites of Involvement	473
34.6 Clinical Symptoms and Signs	473
34.7 Imaging Features	473
34.7.1 Radiographic and CT Features	473
34.7.2 MRI Features	474
34.7.3 Bone Scan	474
34.8 Imaging Differential Diagnosis	474
34.9 Pathology	475
34.9.1 Gross Features	475
34.9.2 Histological Features	476
34.10 Pathology Differential Diagnosis	478
34.11 Ancillary Techniques	479
34.11.1 Genetics	479
34.12 Prognosis	479
34.13 Treatment	479
Suggested Reading	479
Part VIII Vascular Tumors	
35 Conventional Hemangioma and Lymphangioma	483
Yaxia Zhang and Andrew E. Rosenberg	
35.1 Definition	483
35.2 Variants	483
35.3 Etiology	483
35.4 Epidemiology	483
35.5 Sites of Involvement	483

35.6	Clinical Symptoms and Signs	483
35.7	Imaging Features	484
35.7.1	Radiographic Features	484
35.7.2	CT Features	484
35.7.3	MRI Features	484
35.8	Pathology	484
35.8.1	Gross Features	484
35.8.2	Histological Features	484
35.9	Ancillary Techniques	484
35.9.1	Immunohistochemistry	484
35.9.2	Genetics	484
35.10	Pathologic Differential Diagnosis	484
35.11	Prognosis	484
35.12	Treatment	484
	Suggested Reading	496
36	Epithelioid Hemangioma	497
	Yaxia Zhang and Andrew E. Rosenberg	
36.1	Definition	497
36.2	Epidemiology	497
36.3	Sites of Involvement	497
36.4	Clinical Signs and Symptoms	497
36.5	Imaging Features	497
36.5.1	Radiographic Features	497
36.5.2	CT Features	497
36.5.3	MRI Features	497
36.6	Imaging Differential Diagnosis	498
36.7	Pathology	498
36.7.1	Gross Features	498
36.7.2	Microscopic Features	498
36.8	Pathology Differential Diagnosis	499
36.9	Ancillary Methods	499
36.9.1	Immunohistochemistry	499
36.9.2	Ultrastructure	499
36.9.3	Genetics	499
36.10	Prognosis	502
36.11	Treatment	502
	Suggested Reading	503
37	Glomus Tumor	505
	Yaxia Zhang and Andrew E. Rosenberg	
37.1	Definition	505
37.2	Synonyms	505
37.3	Variants	505
37.4	Etiology	505
37.5	Epidemiology	505
37.6	Sites of Involvement	505
37.7	Clinical Symptoms and Signs	505
37.8	Imaging Features	505
37.8.1	Radiographic Features	505
37.8.2	CT Features	506
37.8.3	MRI Features	506
37.9	Imaging Differential Diagnosis	506
37.10	Pathology	507

37.10.1	Gross Features	507
37.10.2	Histological Features	507
37.11	Ancillary Methods	508
37.11.1	Immunohistochemistry	508
37.11.2	Genetics	508
37.12	Prognosis	508
37.13	Treatment	508
	Suggested Reading	510
38	Epithelioid Hemangioendothelioma	511
	Yaxia Zhang and Andrew E. Rosenberg	
38.1	Definition	511
38.2	Epidemiology	511
38.3	Sites of Involvement	511
38.4	Clinical Signs and Symptoms	511
38.5	Imaging Features	511
38.5.1	Radiographic and CT Features	511
38.5.2	MRI Features	511
38.6	Pathology	512
38.6.1	Gross Features	512
38.6.2	Microscopic Features	512
38.7	Ancillary Methods	512
38.7.1	Immunohistochemistry	512
38.7.2	Ultrastructure	516
38.7.3	Genetics	516
38.8	Differential Diagnosis	517
38.9	Prognosis	517
38.10	Treatment	517
	Suggested Reading	517
39	Angiosarcoma	519
	Yaxia Zhang and Andrew E. Rosenberg	
39.1	Definition	519
39.2	Synonyms	519
39.3	Etiology	519
39.4	Epidemiology	519
39.5	Sites of Involvement	519
39.6	Clinical Symptoms and Signs	519
39.7	Imaging Features	519
39.8	Imaging Differential Diagnosis	520
39.9	Pathology	520
39.9.1	Gross Features	520
39.9.2	Histopathological Features	520
39.10	Pathology Differential Diagnosis	522
39.11	Ancillary Methods	522
39.11.1	Immunohistochemistry	522
39.11.2	Genetics	522
39.12	Prognosis	522
39.13	Treatment	523
	Suggested Reading	523
Part IX Adamantinoma		
40	Adamantinoma	527
	Edward McCarthy	
40.1	Definition	527
40.2	Etiology	527

Contents

Part I Introduction

1 Practical Approach to the Diagnosis of Bone Tumors	3
Eduardo Zambrano and K. Krishnan Unni	
1.1 Clinical Features	3
1.2 Roentgenographic Findings	3
1.3 Classification	3
1.3.1 Classification Scheme	3
1.4 Gross Examination	5
1.5 Grading and Staging	7
Suggested Reading	7
2 Special Clinical Aspects of Certain Bone Tumors and Tumor-Like Lesions	9
Francisco Azzato and Silvia Ferrandini	
2.1 Introduction	9
2.2 Reason for Consultation	9
2.3 The Tumor	9
2.3.1 Age of Presentation	9
2.3.2 Tumor Location	9
2.3.3 Tumor Behavior	10
2.4 Complementary Tests	10
2.4.1 CT Scans	10
2.4.2 MRI	10
2.4.3 Bone Scan	11
2.4.4 PET/CT	11
2.4.5 Angiography	11
2.4.6 Laboratory Tests	11
2.5 Preneoplastic Lesions	11
Suggested Reading	11
3 An Imaging Approach to Bone Tumors	13
Darlene M. Holden, Hakan Ilaslan, and Murali Sundaram	
3.1 Imaging Modalities	14
3.1.1 Radiographs	14
3.1.2 Computed Tomography	15
3.1.3 Magnetic Resonance Imaging	15
3.1.4 Bone Scintigraphy	16
3.1.5 Positron Emission Tomography–Computed Tomography	16
3.1.6 Positron Emission Tomography–Magnetic Resonance Imaging	16
3.2 Imaging for Staging and Biopsy	16
3.2.1 Staging	16
3.2.2 Image-Guided Biopsy	16
3.2.3 Image-Guided Treatments	17

3.3	Characteristically Benign Lesions	17
3.3.1	Nonossifying Fibroma	18
3.3.2	Fibrous Dysplasia.	18
3.3.3	Enchondroma.	20
3.3.4	Paget's Disease.	21
3.4	Osteogenic Lesions	26
3.4.1	Osteoid Osteoma	26
3.4.2	Osteblastoma	29
3.4.3	Osteosarcoma.	29
3.5	Cartilage Tumors	36
3.5.1	Osteochondroma	36
3.5.2	Periosteal Chondroma	39
3.5.3	Chondroblastoma	39
3.5.4	Chondromyxoid Fibroma.	41
3.5.5	Chondrosarcoma	41
3.5.6	Dedifferentiated Chondrosarcoma	44
3.5.7	Periosteal Chondrosarcoma	44
3.6	Notochordal Tumors	44
3.6.1	Chordoma.	44
3.6.2	Benign Notochordal Cell Tumor	46
3.7	Ewing Sarcoma	47
3.8	Malignant Fibrohistiocytic Tumor	47
3.9	Osteoclastic Giant Cell–Rich Tumors	49
3.9.1	Giant Cell Tumor	49
3.9.2	Giant Cell Reparative Granuloma	50
3.10	Miscellaneous Tumors	50
3.10.1	Unicameral Bone Cyst.	50
3.10.2	Aneurysmal Bone Cyst	51
3.10.3	Langerhans Cell Histiocytosis	52
3.10.4	Adamantinoma.	53
3.10.5	Osteofibrous Dysplasia	55
3.10.6	Bizarre Parosteal Osteochondromatous Proliferation	56
	References.	57
4	Methods of Bone Biopsy	61
	Eduardo Santini-Araujo, Isabela W. da Cunha, Blas Dios, Rómulo L. Cabrini, and Ricardo K. Kalil	
4.1	Introduction	61
4.2	Surgical Biopsy	61
4.2.1	Intraoperative Biopsy.	62
4.2.2	Paraffin-Embedded Sections	62
4.3	Needle Biopsy (Fine Needle or Trocar Biopsy).	62
4.3.1	Types of Devices	62
4.3.2	Anesthesia and Imaging.	62
4.3.3	Fine Needle Aspiration Biopsy	62
4.3.4	Core Needle Biopsy	65
4.3.5	Coaxial Technique	65
4.3.6	Accuracy and Advantages of Percutaneous Needle Biopsy.	65
4.4	Biopsy for Molecular Studies	68
4.5	Tomographic Classification of Bone Lesions for Planning of CT-Guided Needle Biopsy	70
4.6	Important Concepts and Conclusions	77
	References.	77

5 Basic and Ancillary Techniques in Bone Pathology	79
Kiyong Na and Yong-Koo Park	
5.1 Basic Technique	79
5.2 Histochemistry	79
5.3 Electron Microscopy	79
5.4 Flow Cytometry	80
5.5 Histomorphometry of Undecalcified Bone	80
5.6 Immunohistochemistry	80
5.7 Karyotyping	81
5.8 Blotting	82
5.8.1 Southern Blot	82
5.8.2 Northern Blot	82
5.8.3 Western Blot	82
5.8.4 Dot Blot	82
5.9 Polymerase Chain Reaction (PCR) and Real-Time PCR	83
5.9.1 PCR	83
5.9.2 Real-Time PCR	84
5.10 In Situ Hybridization	84
5.10.1 Fluorescence In Situ Hybridization (FISH)	84
5.10.2 Chromogenic In Situ Hybridization (CISH)	85
5.10.3 Silver In Situ Hybridization (SISH)	86
5.11 Comparative Genomic Hybridization and Chromothripsis	86
5.11.1 Comparative Genomic Hybridization	86
5.11.2 Chromothripsis	86
5.12 DNA Microarray	87
5.12.1 Application of Microarray	87
5.13 Next Generation Sequencing (NGS)	88
Reference	88
6 Grading and Staging	91
Kiyong Na and Yong-Koo Park	
6.1 Grading of Bone Tumors	91
6.1.1 Osteosarcoma	91
6.1.2 Chondrosarcoma	91
6.1.3 Other Bone Tumors	91
6.2 Staging of Musculoskeletal Neoplasms	92
Suggested Reading	93
7 Systemic Treatment of Conventional High-Grade Osteosarcoma	95
Celso Abdon Lopes de Mello	
7.1 Introduction	95
7.2 Preoperative Versus Postoperative Chemotherapy	95
7.3 Alternative Postoperative Chemotherapy for Poor Response	96
7.4 Intensification of Preoperative Chemotherapy Regimens	97
7.5 Systemic Therapy for Older Patients	98
7.6 Treatment for Relapsed Disease	99
Suggested Reading	100
8 Surgical Treatment of Tumors and Tumor-Like Lesions of Bone	103
Brian E. Walczak, Peter S. Rose, Joel M. Post, and Franklin H. Sim	
8.1 Introduction	103
8.2 Biopsy	103
8.3 Amputation (Limb-Sacrificing Surgery)	104
8.4 Limb Salvage (Limb-Sparing Resection)	105
8.4.1 Surgical Margins	105

8.5	Special Considerations	110
8.5.1	Pelvic Lesions	110
8.5.2	Spine Lesions	114
8.5.3	Shoulder Girdle Lesions	116
8.5.4	Periarticular Lesions	116
8.6	Conclusions	118
	References	118

Part II Bone-forming Tumors

9	Medullary Osteoma	123
	Liliana G. Olvi, Gustavo M. Lembo, Eduardo Santini-Araujo, and Ricardo K. Kalil	
9.1	Definition	123
9.2	Synonyms	123
9.3	Etiology	123
9.4	Epidemiology	123
9.5	Sites of Involvement	123
9.6	Clinical Symptoms and Signs	123
9.7	Imaging Features	123
9.7.1	Radiographic Features	123
9.7.2	CT Features	124
9.7.3	MRI Features	124
9.7.4	Bone Scan Features	129
9.8	Imaging Differential Diagnosis (for Large Lesions)	129
9.9	Pathology	129
9.9.1	Gross Features	129
9.9.2	Histological Features	129
9.9.3	Pathologic Differential Diagnosis	129
9.10	Prognosis	129
9.11	Treatment	130
	Suggested Reading	130
10	Parosteal Osteoma	131
	Liliana G. Olvi, Gustavo M. Lembo, Eduardo Santini-Araujo, and Ricardo K. Kalil	
10.1	Definition	131
10.2	Synonyms	131
10.3	Etiology	131
10.4	Epidemiology	131
10.5	Sites of Involvement	131
10.6	Clinical Symptoms and Signs	131
10.7	Imaging Features	132
10.7.1	Radiographic Features	132
10.7.2	CT Features	133
10.7.3	MRI Features	135
10.7.4	Bone Scan Features	135
10.8	Imaging Differential Diagnosis	135
10.9	Pathology	136
10.9.1	Gross Features	136
10.9.2	Histological Features	136
10.9.3	Pathologic Differential Diagnosis	136
10.10	Prognosis	137
10.11	Treatment	137
	Suggested Reading	137

11	Osteoid Osteoma	139
	Liliana G. Olvi, Gustavo M. Lembo, Eduardo Santini-Araujo, and Ricardo K. Kalil	
11.1	Definition	139
11.2	Synonyms	139
11.3	Etiology	139
11.4	Epidemiology	139
11.5	Sites of Involvement	139
11.6	Clinical Symptoms and Signs	139
11.7	Imaging Features	140
11.7.1	Radiographic Features	140
11.7.2	CT Features	141
11.7.3	MRI Features	141
11.7.4	Bone Scan Features	144
11.8	Imaging Differential Diagnosis	144
11.9	Pathology	145
11.9.1	Gross Features	145
11.9.2	Histological Features	145
11.9.3	Pathologic Differential Diagnosis	149
11.9.4	Ancillary Techniques	151
11.10	Prognosis	151
11.11	Treatment	151
	Suggested Reading	160
12	Osteoblastoma	161
	Liliana G. Olvi, Gustavo M. Lembo, Osvaldo Velan, Eduardo Santini-Araujo, and Ricardo K. Kalil	
12.1	Definition	161
12.2	Synonyms	161
12.3	Etiology	161
12.4	Epidemiology	161
12.5	Sites of Involvement	161
12.6	Clinical Symptoms and Signs	161
12.7	Imaging Features	162
12.7.1	Radiographic Features	162
12.7.2	CT Features	162
12.7.3	MRI Features	162
12.7.4	Bone Scan Features	162
12.8	Imaging Differential Diagnosis	164
12.9	Pathology	165
12.9.1	Gross Features	165
12.9.2	Histological Features	165
12.9.3	Pathologic Differential Diagnosis	172
12.9.4	Genetics	180
12.10	Prognosis	180
12.11	Treatment	181
	Suggested Reading	181
13	Conventional Central Osteosarcoma	183
	Franco Bertoni, Jodi M. Carter, and Patrizia Bacchini	
13.1	Conventional Central Osteosarcoma	183
13.1.1	Definition	183
13.1.2	Synonyms	183
13.1.3	Etiology	183
13.1.4	Clinical Features	183

13.1.5	Image Diagnosis	184
13.1.6	Pathology	186
13.1.7	Prognosis	202
13.1.8	Treatment	203
13.2	Low-Grade Central Osteosarcoma (LGCOS)	205
13.2.1	Definition	205
13.2.2	Etiology	205
13.2.3	Clinical Features	205
13.2.4	Image Diagnosis	205
13.2.5	Pathology	206
13.2.6	Prognosis	209
13.2.7	Treatment	209
	Suggested Reading	209
14	Osteosarcoma of the Jaws	211
	María L. Paparella and Rómulo L. Cabrini	
14.1	Definition	211
14.2	Synonyms	211
14.3	Etiology	211
14.4	Epidemiology	211
14.5	Sites of Involvement	211
14.6	Clinical Symptoms and Signs	211
14.7	Imaging Features	211
14.8	Pathology	213
14.8.1	Gross Features	213
14.8.2	Histopathological Features	213
14.9	Pathological Differential Diagnosis	213
14.10	Prognosis	215
14.11	Treatment	216
	Suggested Reading	221
15	Parosteal Osteosarcoma	223
	Carrie Y. Inwards and Doris E. Wenger	
15.1	Definition	223
15.2	Synonyms	223
15.3	Etiology	223
15.4	Epidemiology	223
15.5	Sites of Involvement	223
15.6	Clinical Signs and Symptoms	223
15.7	Imaging Features	223
15.7.1	Radiographic Features	223
15.7.2	CT Features	223
15.7.3	MRI Features	225
15.7.4	Bone Scan Features	225
15.8	Imaging Differential Diagnosis	225
15.9	Pathology	227
15.9.1	Gross Features	227
15.9.2	Histological Features	227
15.10	Pathologic Differential Diagnosis	230
15.11	Ancillary Studies	230
15.11.1	Immunohistochemistry	230
15.11.2	Genetics	230
15.12	Prognosis	230
15.13	Treatment	230
	Suggested Reading	230

16 Periosteal Osteosarcoma	233
Carrie Y. Inwards and Doris E. Wenger	
16.1 Definition	233
16.2 Synonyms	233
16.3 Etiology	233
16.4 Epidemiology	233
16.5 Sites of Involvement	233
16.6 Clinical Signs and Symptoms	233
16.7 Imaging Features	233
16.7.1 Radiographic Features	233
16.7.2 CT Features	234
16.7.3 MRI Features	234
16.7.4 Bone Scan Features	235
16.8 Imaging Differential Diagnosis	235
16.9 Pathology	236
16.9.1 Gross Features	236
16.9.2 Histological Features	236
16.10 Pathologic Differential Diagnosis	238
16.11 Ancillary Studies	238
16.11.1 Genetics	238
16.12 Prognosis	238
16.13 Treatment	238
Suggested Reading	239
17 High-Grade Surface Osteosarcoma	241
Carrie Y. Inwards and Doris E. Wenger	
17.1 Definition	241
17.2 Synonyms	241
17.3 Etiology	241
17.4 Clinical Features	241
17.4.1 Epidemiology	241
17.4.2 Sex	241
17.4.3 Age	241
17.4.4 Sites of Involvement	241
17.4.5 Clinical Signs and Symptoms	241
17.5 Image Diagnosis	241
17.5.1 Radiographic Features	241
17.5.2 CT Features	241
17.5.3 MRI Features	243
17.5.4 Bone Scan	243
17.6 Imaging Differential Diagnosis	243
17.7 Pathology	243
17.7.1 Gross Features	243
17.7.2 Histological Features	243
17.7.3 Histologic Differential Diagnosis	243
17.8 Genetics	244
17.9 Prognosis	244
17.10 Treatment	244
Suggested Reading	244
Part III Cartilage-forming Tumors	
18 Enchondroma	247
Kiyong Na and Yong-Koo Park	
18.1 Definition	247
18.2 Synonyms	247

18.3	Etiology	247
18.4	Epidemiology	247
18.5	Sites of Involvement	247
18.6	Clinical Symptoms and Signs	247
18.7	Imaging Features	247
18.7.1	Radiographic Features	247
18.7.2	CT Features	248
18.7.3	MRI Features	248
18.8	Imaging Differential Diagnosis	248
18.9	Pathology	249
18.9.1	Gross Features	249
18.9.2	Histological Features	250
18.9.3	Pathologic Differential Diagnosis	250
18.9.4	Ancillary Techniques	251
18.10	Prognosis	254
18.11	Treatment	254
	Suggested Reading	254
19	Multiple Enchondromatosis (Ollier's Disease)	257
	Kiyong Na and Yong-Koo Park	
19.1	Definition	257
19.2	Synonyms	257
19.3	Etiology	257
19.4	Epidemiology	257
19.5	Sites of Involvement	257
19.6	Clinical Symptoms and Signs	257
19.7	Imaging Features	257
19.8	Imaging Differential Diagnosis	260
19.9	Pathology	260
19.9.1	Gross Features	260
19.9.2	Histological Features	260
19.9.3	Pathologic Differential Diagnosis	260
19.9.4	Ancillary Techniques	260
19.10	Prognosis	261
19.11	Treatment	261
	Suggested Reading	265
20	Periosteal Chondroma	267
	Kiyong Na and Yong-Koo Park	
20.1	Definition	267
20.2	Synonyms	267
20.3	Etiology	267
20.4	Epidemiology	267
20.5	Sites of Involvement	267
20.6	Clinical Symptoms and Signs	267
20.7	Imaging Features	267
20.7.1	Radiographic Features	267
20.7.2	CT Features	267
20.7.3	MRI Features	268
20.8	Imaging Differential Diagnosis	268
20.9	Pathology	268
20.9.1	Gross Features	268
20.9.2	Histological Features	269
20.9.3	Pathologic Differential Diagnosis	271
20.9.4	Ancillary Techniques	272

20.10	Prognosis	272
20.11	Treatment	272
	Suggested Reading	272
21	Osteochondroma	273
	Kiyong Na and Yong-Koo Park	
21.1	Definition	273
21.2	Synonyms	273
21.3	Etiology	273
21.4	Epidemiology	273
21.5	Sites of Involvement	273
21.6	Clinical Symptoms and Signs	273
21.7	Imaging Features	274
21.8	Imaging Differential Diagnosis	275
21.9	Pathology	276
21.9.1	Gross Features	276
21.9.2	Histological Features	276
21.9.3	Pathologic Differential Diagnosis	278
21.9.4	Ancillary Techniques	278
21.10	Prognosis	278
21.11	Treatment	282
	Suggested Reading	282
22	Multiple Osteochondromatosis	283
	Kiyong Na and Yong-Koo Park	
22.1	Definition	283
22.2	Synonyms	283
22.3	Etiology	283
22.4	Epidemiology	283
22.5	Sites of Involvement	283
22.6	Clinical Symptoms and Signs	283
22.7	Imaging Features	284
22.8	Pathology	284
22.8.1	Gross and Histologic Features	284
22.8.2	Ancillary Techniques	284
22.9	Prognosis	285
22.10	Treatment	285
	Suggested Reading	292
23	Chondroblastoma	293
	Kiyong Na and Yong-Koo Park	
23.1	Definition	293
23.2	Synonyms	293
23.3	Etiology	293
23.4	Epidemiology	293
23.5	Sites of Involvement	293
23.6	Clinical Symptoms and Signs	294
23.7	Imaging Features	294
23.7.1	Radiographic Features	294
23.7.2	CT Features	294
23.7.3	MRI Features	295
23.8	Imaging Differential Diagnosis	295
23.9	Pathology	295
23.9.1	Gross Features	295
23.9.2	Histological Features	295

23.9.3	Pathologic Differential Diagnosis	297
23.9.4	Ancillary Techniques	298
23.10	Prognosis	302
23.11	Treatment	302
	Suggested Reading	302
24	Chondromyxoid Fibroma	305
	Kiyong Na and Yong-Koo Park	
24.1	Definition	305
24.2	Synonyms	305
24.3	Epidemiology	305
24.4	Sites of Involvement	305
24.5	Clinical Symptoms and Signs	305
24.6	Imaging Features	305
24.6.1	Radiographic Features	305
24.6.2	CT Features	306
24.6.3	MRI Features	308
24.7	Imaging Differential Diagnosis	308
24.8	Pathology	308
24.8.1	Gross Features	308
24.8.2	Histological Features	309
24.8.3	Pathology Differential Diagnosis	310
24.8.4	Ancillary Techniques	313
24.9	Prognosis	314
24.10	Treatment	314
	Suggested Reading	314
25	Chondrosarcoma	317
	Sergio Piña-Oviedo, Jae Y. Ro, and Alberto G. Ayala	
25.1	Primary Chondrosarcoma	318
25.1.1	Conventional Intramedullary Chondrosarcoma	318
25.1.2	Periosteal (Juxtacortical) Chondrosarcoma	339
25.2	Secondary Chondrosarcoma	342
25.2.1	Secondary Peripheral Chondrosarcoma	342
25.2.2	Secondary Central Chondrosarcoma	347
	References	348
26	Chondrosarcoma Variants	353
	Kiyong Na and Yong-Koo Park	
26.1	Dedifferentiated Chondrosarcoma	353
26.1.1	Definition	353
26.1.2	Etiology	353
26.1.3	Epidemiology	353
26.1.4	Sites of Involvement	353
26.1.5	Clinical Symptoms and Signs	353
26.1.6	Imaging Features	354
26.1.7	Imaging Differential Diagnosis	354
26.1.8	Pathology	354
26.1.9	Pathologic Differential Diagnosis	354
26.1.10	Ancillary Techniques	357
26.1.11	Prognosis	360
26.1.12	Treatment	360
26.2	Mesenchymal Chondrosarcoma	360
26.2.1	Definition	360
26.2.2	Etiology	360

26.2.3	Epidemiology	360
26.2.4	Sites of Involvement	360
26.2.5	Clinical Symptoms and Signs	360
26.2.6	Imaging Features	360
26.2.7	Imaging Differential Diagnosis	361
26.2.8	Pathology	361
26.2.9	Pathologic Differential Diagnosis	361
26.2.10	Ancillary Techniques	362
26.2.11	Prognosis	363
26.2.12	Treatment	364
26.3	Clear Cell Chondrosarcoma	364
26.3.1	Definition	365
26.3.2	Etiology	365
26.3.3	Epidemiology	365
26.3.4	Sites of Involvement	365
26.3.5	Clinical Symptoms and Signs	365
26.3.6	Imaging Features	366
26.3.7	Imaging Differential Diagnosis	366
26.3.8	Pathology	367
26.3.9	Pathologic Differential Diagnosis	368
26.3.10	Ancillary Techniques	368
26.3.11	Prognosis	372
26.3.12	Treatment	372
	References	374
Part IV Giant Cell Tumor		
27	Giant Cell Tumor of Bone	381
	Ricardo K. Kalil and Fernanda Amary	
27.1	Definition	381
27.2	Synonyms	381
27.3	Etiology	381
27.4	Epidemiology	381
27.5	Sites of Involvement	381
27.6	Clinical Symptoms and Signs	382
27.7	Image Diagnosis	382
27.7.1	Radiographic Features	382
27.7.2	CT Features	383
27.7.3	MRI Features	383
27.7.4	Image Differential Diagnosis	383
27.8	Pathology	384
27.8.1	Gross Features	384
27.8.2	Histological Features	385
27.8.3	Pathology Differential Diagnosis	386
27.8.4	Ancillary Techniques	387
27.9	Prognosis	388
27.10	Treatment	389
	Suggested Reading	396
Part V Round Cell Tumors		
28	Ewing's Sarcoma Family of Tumors	401
	Isidro Machado and Antonio Llombart-Bosch	
28.1	Definition	401
28.2	Synonyms	401

28.3	Etiology	401
28.4	Epidemiology	401
28.5	Sites of Involvement	401
28.6	Clinical Symptoms and Signs	401
28.7	Imaging Features	402
	28.7.1 Radiographic Features	402
	28.7.2 CT Features	402
	28.7.3 MRI Features	402
	28.7.4 Bone Scan	403
28.8	Imaging Differential Diagnosis	403
28.9	Pathology	403
	28.9.1 Gross Features	403
	28.9.2 Histological Features	403
28.10	Ancillary Techniques	404
	28.10.1 Immunohistochemistry	404
	28.10.2 Ultrastructure	404
	28.10.3 Molecular Biology	405
28.11	Pathologic Differential Diagnosis	405
28.12	Prognosis	414
28.13	Treatment	414
	Suggested Reading	414
29	Lymphoma of Bone	417
	S. Fiona Bonar	
29.1	Definition	417
29.2	Synonyms	417
29.3	Etiology	417
29.4	Epidemiology	417
29.5	Sites of Involvement	417
29.6	Clinical Signs and Symptoms	417
29.7	Imaging Features	418
	29.7.1 Radiographic Features	418
	29.7.2 CT, PET, and Bone Scan Findings	421
	29.7.3 MRI Features	421
29.8	Imaging Differential Diagnosis	426
29.9	Pathology	427
	29.9.1 Gross Features	427
	29.9.2 Histopathology	428
	29.9.3 Cytological Findings	431
	29.9.4 Ancillary Techniques	431
	29.9.5 Pathological Differential Diagnosis	434
29.10	Prognosis	437
29.11	Treatment	437
	Suggested Reading	437
30	Myeloma	439
	Michael J. Klein	
30.1	Definition	439
30.2	Synonyms	439
30.3	Etiology	439
30.4	Epidemiology	440
30.5	Sites of Involvement	440
30.6	Clinical Symptoms and Signs	440
30.7	Imaging Diagnosis	440
	30.7.1 Radiographic Features	440

30.7.2	CT Features	440
30.7.3	MRI Features	440
30.8	Imaging Differential Diagnosis	441
30.9	Pathology	441
30.9.1	Gross Features	441
30.9.2	Histologic Features	442
30.9.3	Pathologic Differential Diagnosis	443
30.10	Prognosis	444
30.11	Treatment	444
	Suggested Reading	448
Part VI Fibrous Tumors		
31	Desmoplastic Fibroma of Bone	451
	Ricardo K. Kalil	
31.1	Definition	451
31.2	Synonyms	451
31.3	Etiology	451
31.4	Epidemiology	451
31.5	Sites of Involvement	451
31.6	Clinical Symptoms and Signs	451
31.7	Imaging Features	451
31.7.1	Radiographic Features	451
31.7.2	CT Features	451
31.7.3	MRI Features	452
31.8	Imaging Differential Diagnosis	452
31.9	Pathology	453
31.9.1	Gross Features	453
31.9.2	Histological Features	453
31.10	Pathologic Differential Diagnosis	456
31.11	Ancillary Techniques	456
31.11.1	Genetics	456
31.12	Prognosis	456
31.13	Treatment	456
	Suggested Reading	456
32	Fibrosarcoma of Bone	459
	Ricardo K. Kalil	
32.1	Definition	459
32.2	Synonyms	459
32.3	Etiology	459
32.4	Epidemiology	459
32.5	Sites of Involvement	459
32.6	Clinical Symptoms and Signs	459
32.7	Imaging Features	459
32.7.1	Radiographic and CT Features	459
32.8	Imaging Differential Diagnosis	460
32.9	Pathology	461
32.9.1	Gross Features	461
32.9.2	Histological Features	461
32.10	Pathologic Differential Diagnosis	462
32.11	Ancillary Techniques	462
32.11.1	Genetics	462
32.12	Prognosis	463
32.13	Treatment	463
	Suggested Reading	463

Part VII Tumors of Undetermined Origin

33 Benign Fibrous Histiocytoma of Bone	467
Ricardo K. Kalil	
33.1 Definition	467
33.2 Synonyms	467
33.3 Etiology	467
33.4 Epidemiology	467
33.5 Sites of Involvement	467
33.6 Clinical Symptoms and Signs	467
33.7 Imaging Features	467
33.7.1 Radiographic Features	467
33.7.2 CT Features	467
33.7.3 MRI Features	468
33.8 Imaging Differential Diagnosis	468
33.9 Pathology	468
33.9.1 Gross Features	468
33.9.2 Histological Features	468
33.10 Pathologic Differential Diagnosis	470
33.11 Prognosis	471
33.12 Treatment	471
Suggested Reading	471
34 Undifferentiated Pleomorphic Sarcoma of Bone	473
Ricardo K. Kalil	
34.1 Definition	473
34.2 Synonyms	473
34.3 Etiology	473
34.4 Epidemiology	473
34.5 Sites of Involvement	473
34.6 Clinical Symptoms and Signs	473
34.7 Imaging Features	473
34.7.1 Radiographic and CT Features	473
34.7.2 MRI Features	474
34.7.3 Bone Scan	474
34.8 Imaging Differential Diagnosis	474
34.9 Pathology	475
34.9.1 Gross Features	475
34.9.2 Histological Features	476
34.10 Pathology Differential Diagnosis	478
34.11 Ancillary Techniques	479
34.11.1 Genetics	479
34.12 Prognosis	479
34.13 Treatment	479
Suggested Reading	479
Part VIII Vascular Tumors	
35 Conventional Hemangioma and Lymphangioma	483
Yaxia Zhang and Andrew E. Rosenberg	
35.1 Definition	483
35.2 Variants	483
35.3 Etiology	483
35.4 Epidemiology	483
35.5 Sites of Involvement	483

35.6	Clinical Symptoms and Signs	483
35.7	Imaging Features	484
35.7.1	Radiographic Features	484
35.7.2	CT Features	484
35.7.3	MRI Features	484
35.8	Pathology	484
35.8.1	Gross Features	484
35.8.2	Histological Features	484
35.9	Ancillary Techniques	484
35.9.1	Immunohistochemistry	484
35.9.2	Genetics	484
35.10	Pathologic Differential Diagnosis	484
35.11	Prognosis	484
35.12	Treatment	484
	Suggested Reading	496
36	Epithelioid Hemangioma	497
	Yaxia Zhang and Andrew E. Rosenberg	
36.1	Definition	497
36.2	Epidemiology	497
36.3	Sites of Involvement	497
36.4	Clinical Signs and Symptoms	497
36.5	Imaging Features	497
36.5.1	Radiographic Features	497
36.5.2	CT Features	497
36.5.3	MRI Features	497
36.6	Imaging Differential Diagnosis	498
36.7	Pathology	498
36.7.1	Gross Features	498
36.7.2	Microscopic Features	498
36.8	Pathology Differential Diagnosis	499
36.9	Ancillary Methods	499
36.9.1	Immunohistochemistry	499
36.9.2	Ultrastructure	499
36.9.3	Genetics	499
36.10	Prognosis	502
36.11	Treatment	502
	Suggested Reading	503
37	Glomus Tumor	505
	Yaxia Zhang and Andrew E. Rosenberg	
37.1	Definition	505
37.2	Synonyms	505
37.3	Variants	505
37.4	Etiology	505
37.5	Epidemiology	505
37.6	Sites of Involvement	505
37.7	Clinical Symptoms and Signs	505
37.8	Imaging Features	505
37.8.1	Radiographic Features	505
37.8.2	CT Features	506
37.8.3	MRI Features	506
37.9	Imaging Differential Diagnosis	506
37.10	Pathology	507

37.10.1	Gross Features	507
37.10.2	Histological Features	507
37.11	Ancillary Methods	508
37.11.1	Immunohistochemistry	508
37.11.2	Genetics	508
37.12	Prognosis	508
37.13	Treatment	508
	Suggested Reading	510
38	Epithelioid Hemangioendothelioma	511
	Yaxia Zhang and Andrew E. Rosenberg	
38.1	Definition	511
38.2	Epidemiology	511
38.3	Sites of Involvement	511
38.4	Clinical Signs and Symptoms	511
38.5	Imaging Features	511
38.5.1	Radiographic and CT Features	511
38.5.2	MRI Features	511
38.6	Pathology	512
38.6.1	Gross Features	512
38.6.2	Microscopic Features	512
38.7	Ancillary Methods	512
38.7.1	Immunohistochemistry	512
38.7.2	Ultrastructure	516
38.7.3	Genetics	516
38.8	Differential Diagnosis	517
38.9	Prognosis	517
38.10	Treatment	517
	Suggested Reading	517
39	Angiosarcoma	519
	Yaxia Zhang and Andrew E. Rosenberg	
39.1	Definition	519
39.2	Synonyms	519
39.3	Etiology	519
39.4	Epidemiology	519
39.5	Sites of Involvement	519
39.6	Clinical Symptoms and Signs	519
39.7	Imaging Features	519
39.8	Imaging Differential Diagnosis	520
39.9	Pathology	520
39.9.1	Gross Features	520
39.9.2	Histopathological Features	520
39.10	Pathology Differential Diagnosis	522
39.11	Ancillary Methods	522
39.11.1	Immunohistochemistry	522
39.11.2	Genetics	522
39.12	Prognosis	522
39.13	Treatment	523
	Suggested Reading	523
Part IX Adamantinoma		
40	Adamantinoma	527
	Edward McCarthy	
40.1	Definition	527
40.2	Etiology	527

40.3	Clinical Features	527
40.3.1	Sites of Involvement	527
40.3.2	Epidemiology	527
40.3.3	Clinical Signs and Symptoms	527
40.4	Image Diagnosis	527
40.4.1	Radiologic Features	527
40.4.2	MRI Features	527
40.4.3	Image Differential Diagnosis	527
40.5	Pathology	527
40.5.1	Pathologic Differential Diagnosis	529
40.6	Treatment and Prognosis	529
	Suggested Reading	530
Part X Notochordal Tumors		
41	Benign Notochordal Cell Tumor	533
	Yasuaki Nakashima	
41.1	Definition	533
41.2	Synonyms	533
41.3	Etiology	533
41.4	Epidemiology	533
41.5	Sites of Involvement	533
41.6	Clinical Symptoms and Signs	533
41.7	Imaging Features	533
41.7.1	Radiographic Features	533
41.7.2	CT Features	534
41.7.3	MRI Features	534
41.7.4	Bone Scan Features	534
41.8	Imaging Differential Diagnosis	534
41.9	Pathology	537
41.9.1	Gross Features	537
41.9.2	Histological Features	537
41.10	Pathologic Differential Diagnosis	538
41.11	Ancillary Methods	539
41.11.1	Immunohistochemistry	539
41.11.2	Genetics	539
41.12	Prognosis	539
41.13	Treatment	539
	Suggested Reading	541
42	Chordoma	543
	Yasuaki Nakashima	
42.1	Definition	543
42.2	Etiology	543
42.3	Epidemiology	543
42.4	Sites of Involvement	543
42.5	Clinical Symptoms and Signs	543
42.6	Imaging Features	545
42.6.1	Radiographic Features	545
42.6.2	CT Features	545
42.6.3	MRI Features	545
42.6.4	Bone Scan Features	545
42.7	Imaging Differential Diagnosis	545
42.8	Pathology	550
42.8.1	Gross Features	550
42.8.2	Histological Features	551

42.9	Pathologic Differential Diagnosis	554
42.10	Ancillary Techniques	559
42.10.1	Immunohistochemistry	559
42.10.2	Genetics	559
42.11	Prognosis	559
42.12	Treatment	559
	Suggested Reading	559

Part XI Leiomyosarcoma

43	Leiomyosarcoma of Bone	565
	Ricardo K. Kalil	
43.1	Definition	565
43.2	Etiology	565
43.3	Epidemiology	565
43.4	Sites of Involvement	565
43.5	Clinical Symptoms and Signs	565
43.6	Imaging Features	565
43.6.1	Radiographic Features	565
43.6.2	CT and MRI Features	565
43.7	Imaging Differential Diagnosis	565
43.8	Pathology	566
43.8.1	Gross Features	566
43.8.2	Histological Features	566
43.9	Pathologic Differential Diagnosis	566
43.10	Ancillary Techniques	566
43.10.1	Genetics	567
43.11	Prognosis	567
43.12	Treatment	567
	Suggested Reading	567

Part XII Adipocytic Tumors

44	Lipoma of Bone	571
	Ricardo K. Kalil	
44.1	Definition	571
44.2	Etiology	571
44.3	Epidemiology	571
44.4	Sites of Involvement	571
44.5	Clinical Symptoms and Signs	571
44.6	Imaging Features	571
44.6.1	Radiographic Features	571
44.6.2	CT and MRI Features	571
44.7	Imaging Differential Diagnosis	571
44.8	Pathology	572
44.8.1	Gross Features	572
44.8.2	Histological Features	574
44.9	Pathologic Differential Diagnosis	574
44.10	Genetics	574
44.11	Prognosis	574
44.12	Treatment	574
	Suggested Reading	575
45	Liposarcoma of Bone	577
	Ricardo K. Kalil	
45.1	Definition	577
45.2	Etiology	577

45.3	Epidemiology	577
45.4	Sites of Involvement	577
45.5	Clinical Symptoms and Signs	577
45.6	Imaging Features	577
45.7	Imaging Differential Diagnosis	578
45.8	Pathology	578
45.8.1	Gross Features	578
45.8.2	Histological Features	578
45.9	Pathologic Differential Diagnosis	579
45.10	Ancillary Techniques	579
45.10.1	Genetics	579
45.11	Prognosis	579
45.12	Treatment	579
	Suggested Reading	580
 Part XIII Neurogenic Tumors		
46	Schwannoma of Bone	583
	Ricardo K. Kalil	
46.1	Definition	583
46.2	Synonyms	583
46.3	Etiology	583
46.4	Epidemiology	583
46.5	Sites of Involvement	583
46.6	Clinical Symptoms and Signs	583
46.7	Imaging Features	583
46.8	Imaging Differential Diagnosis	584
46.9	Pathology	584
46.9.1	Gross Features	584
46.9.2	Histological Features	584
46.10	Pathologic Differential Diagnosis	584
46.11	Ancillary Techniques	584
46.11.1	Genetics	586
46.12	Prognosis	586
46.13	Treatment	586
	Suggested Reading	586
47	Neurofibroma of Bone	587
	Ricardo K. Kalil	
47.1	Definition	587
47.2	Etiology	587
47.3	Epidemiology	587
47.4	Sites of Involvement	587
47.5	Clinical Symptoms and Signs	587
47.6	Imaging Features	587
47.7	Imaging Differential Diagnosis	587
47.8	Pathology	588
47.8.1	Gross Features	588
47.8.2	Histological Features	588
47.9	Pathologic Differential Diagnosis	588
47.10	Ancillary Techniques	588
47.10.1	Genetics	588
47.11	Prognosis	588
47.12	Treatment	588
	Suggested Reading	588

Part XIV Phosphaturic Mesenchymal Tumor

48 Phosphaturic Mesenchymal Tumor	591
Kiyong Na, Yong-Koo Park, and Ricardo K. Kalil	
48.1 Definition	591
48.2 Etiology	591
48.3 Epidemiology	591
48.4 Sites of Involvement	591
48.5 Clinical Symptoms and Signs	592
48.6 Imaging Features	592
48.6.1 Radiographic Features	592
48.6.2 MRI Features	592
48.6.3 Bone Scan	592
48.7 Imaging Differential Diagnosis	593
48.8 Pathology	593
48.8.1 Gross Features	593
48.8.2 Histological Features	593
48.9 Pathologic Differential Diagnosis	595
48.10 Ancillary Techniques	597
48.10.1 Genetics	598
48.11 Prognosis	598
48.12 Treatment	599
Suggested Reading	599

Part XV Metastatic Carcinoma Involving Bone

49 Metastatic Bone Carcinoma	603
Patrizia Bacchini and Franco Bertoni	
49.1 Definition	603
49.2 Etiology	603
49.3 Epidemiology	603
49.4 Sites of Involvement	603
49.5 Symptoms	603
49.6 Image Diagnosis	603
49.7 Pathology	604
49.7.1 Gross Features	604
49.7.2 Histologic Features	604
49.7.3 Pathological Differential Diagnosis	604
49.7.4 Ancillary Techniques	604
49.8 Prognosis	609
49.9 Treatment	609
Suggested Reading	609

**Part XVI Tumor-like Lesions and Other Conditions
That Simulate Primary Bone Tumors**

50 Simple Bone Cyst	613
Liliana G. Olvi, Gustavo M. Lembo, Osvaldo Velan, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
50.1 Definition	613
50.2 Synonyms	613
50.3 Etiology	613
50.4 Epidemiology	613
50.5 Sites of Involvement	613
50.6 Clinical Symptoms and Signs	615

50.7	Imaging Features	615
50.7.1	Radiographic Features	615
50.7.2	CT Features	618
50.7.3	MRI Features	618
50.7.4	Bone Scan Features	619
50.8	Imaging Differential Diagnosis	619
50.9	Pathology	621
50.9.1	Gross Features	621
50.9.2	Histological Features	621
50.10	Pathologic Differential Diagnosis	622
50.11	Ancillary Techniques	624
50.11.1	Genetics	624
50.12	Prognosis	624
50.13	Treatment	627
	Suggested Reading	629
51	Aneurysmal Bone Cyst	631
	Liliana G. Olvi, Gustavo M. Lembo, Osvaldo Velan, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
51.1	Definition	631
51.1.1	Variants	631
51.2	Synonyms	631
51.3	Etiology	631
51.4	Epidemiology	631
51.5	Sites of Involvement	631
51.6	Clinical Symptoms and Signs	632
51.7	Imaging Features	632
51.7.1	Radiographic Features	632
51.7.2	CT Features	632
51.7.3	MRI Features	632
51.7.4	Bone Scan Features	632
51.8	Imaging Differential Diagnosis	632
51.9	Pathology	633
51.9.1	Gross Features	633
51.9.2	Histological Features	633
51.10	Pathologic Differential Diagnosis	633
51.11	Ancillary Techniques	634
51.11.1	Genetics	634
51.12	Prognosis	634
51.13	Treatment	634
	Suggested Reading	677
52	Juxta-Articular Bone Cyst	679
	Liliana G. Olvi, Gustavo M. Lembo, Osvaldo Velan, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
52.1	Definition	679
52.2	Synonyms	679
52.3	Etiology	679
52.4	Epidemiology	679
52.5	Sites of Involvement	679
52.6	Clinical Symptoms and Signs	679
52.7	Imaging Features	680
52.7.1	Radiographic Features	680
52.7.2	CT Features	680

52.7.3	MRI Features	680
52.7.4	Bone Scan Features	680
52.8	Imaging Differential Diagnosis	680
52.9	Pathology	692
52.9.1	Gross Features	692
52.9.2	Histological Features	692
52.10	Pathologic Differential Diagnosis	693
52.11	Prognosis	693
52.12	Treatment	693
	Suggested Reading	693
53	Epidermoid Bone Cyst	695
	Liliana G. Olvi, Maria L. Gonzalez, Osvaldo Velan, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
53.1	Definition	695
53.2	Synonyms.	695
53.3	Etiology	695
53.4	Epidemiology.	695
53.5	Sites of Involvement.	695
53.6	Clinical Symptoms and Signs	695
53.7	Imaging Features	695
53.7.1	Radiographic Features	695
53.7.2	CT Features	697
53.7.3	MRI Features	697
53.8	Imaging Differential Diagnosis	697
53.9	Pathology	698
53.9.1	Gross Features	698
53.9.2	Histological Features	698
53.10	Pathologic Differential Diagnosis	699
53.11	Prognosis	699
53.12	Treatment	699
	Suggested Reading	699
54	Metaphyseal Fibrous Defect.	701
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
54.1	Definition	701
54.2	Synonyms.	701
54.3	Etiology	701
54.4	Epidemiology.	701
54.5	Sites of Involvement.	701
54.6	Clinical Symptoms and Signs	701
54.7	Imaging Features	702
54.7.1	Radiographic Features	702
54.7.2	CT Features	711
54.7.3	MRI Features	711
54.7.4	Bone Scan Features	711
54.8	Imaging Differential Diagnosis	711
54.9	Pathology	712
54.9.1	Gross Features	712
54.9.2	Histological Features	712
54.10	Pathologic Differential Diagnosis	713
54.11	Prognosis	717
54.12	Treatment	717
	Suggested Reading	717

55	Periosteal Desmoid	719
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
55.1	Definition	719
55.2	Synonyms	719
55.3	Etiology	719
55.4	Epidemiology	719
55.5	Sites of Involvement	719
55.6	Clinical Symptoms and Signs	719
55.7	Imaging Features	719
55.7.1	Radiographic, CT, and MRI Features	719
55.8	Imaging Differential Diagnosis	719
55.9	Pathology	719
55.9.1	Gross Features	719
55.9.2	Histological Features	720
55.10	Pathologic Differential Diagnosis	720
55.11	Prognosis	720
55.12	Treatment	720
	Suggested Reading	722
56	Fibrous Dysplasia	723
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
56.1	Definition	723
56.2	Etiology	723
56.3	Epidemiology	723
56.4	Sites of Involvement	723
56.5	Clinical Symptoms and Signs	723
56.6	Imaging Features	724
56.6.1	Radiographic Features	724
56.6.2	CT Features	724
56.6.3	MRI Features	726
56.6.4	Bone Scan Features	726
56.6.5	Positron Emission Tomography (PET) Scan	726
56.7	Imaging Differential Diagnosis	726
56.8	Pathology	741
56.8.1	Gross Features	741
56.8.2	Histological Features	742
56.9	Pathologic Differential Diagnosis	745
56.10	Ancillary Techniques	753
56.10.1	Genetics	753
56.11	Prognosis	753
56.12	Treatment	753
	Suggested Reading	753
57	Osteofibrous Dysplasia	755
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
57.1	Definition	755
57.2	Etiology	755
57.3	Epidemiology	755
57.4	Sites of Involvement	755
57.5	Clinical Symptoms and Signs	755
57.6	Imaging Features	755
57.6.1	Radiographic Features	755
57.6.2	MRI Features	755
57.6.3	Bone Scan Features	755

57.7	Imaging Differential Diagnosis	755
57.8	Pathology	756
57.8.1	Gross Features	756
57.8.2	Histological Features	756
57.9	Pathologic Differential Diagnosis	757
57.10	Ancillary Techniques	758
57.10.1	Genetic Findings	758
57.11	Prognosis	758
57.12	Treatment	758
	Suggested Reading	761
58	Myositis Ossificans	763
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
58.1	Definition	763
58.2	Synonym	763
58.3	Etiology	763
58.4	Epidemiology	763
58.5	Sites	763
58.6	Clinical Symptoms and Signs	763
58.7	Imaging Features	764
58.7.1	Radiographic Features	764
58.7.2	CT Features	769
58.7.3	MRI Features	769
58.7.4	Bone Scan Features	769
58.8	Imaging Differential Diagnosis	769
58.9	Pathology	769
58.9.1	Gross Features	769
58.9.2	Histological Features	769
58.10	Pathologic Differential Diagnosis	771
58.11	Ancillary Techniques	774
58.11.1	Genetics	774
58.12	Prognosis	774
58.13	Treatment	774
	Suggested Reading	775
59	Giant Cell Reparative Granuloma	777
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
59.1	Definition	777
59.2	Synonyms	777
59.3	Etiology	777
59.4	Epidemiology	777
59.5	Sites of Involvement	777
59.6	Clinical Symptoms and Signs	777
59.7	Imaging Features	777
59.7.1	Radiographic Features	777
59.7.2	CT Features	778
59.7.3	MRI Features	778
59.8	Imaging Differential Diagnosis	778
59.9	Pathology	778
59.9.1	Gross Features	778
59.9.2	Histological Features	778
59.10	Pathologic Differential Diagnosis	780
59.11	Ancillary Techniques	782
59.11.1	Genetics	782

59.12	Prognosis	782
59.13	Treatment	782
	Suggested Reading	782
60	Central Giant Cell Granuloma of the Jaws	785
	María L. Paparella and Rómulo L. Cabrini	
60.1	Definition	785
60.2	Synonyms	785
60.3	Clinical Features	785
60.3.1	Etiology	785
60.4	Epidemiology	785
60.4.1	Sex	785
60.4.2	Age	785
60.4.3	Sites of Involvement	785
60.4.4	Clinical Symptoms and Signs	785
60.4.5	Image Diagnosis	785
60.5	Pathology	786
60.5.1	Histopathological Features	786
60.6	Prognosis	787
60.7	Treatment	787
61	Langerhans Cell Histiocytosis	789
	Ricardo K. Kalil	
61.1	Definition	789
61.2	Synonyms	789
61.3	Etiology	789
61.4	Epidemiology	789
61.5	Sites of Involvement	789
61.6	Clinical Symptoms and Signs	789
61.7	Imaging Features	790
61.7.1	Radiographic and CT Features	790
61.7.2	MRI Features	790
61.8	Imaging Differential Diagnosis	790
61.9	Pathology	792
61.9.1	Gross Features	792
61.9.2	Microscopic Features	792
61.10	Pathologic Differential Diagnosis	794
61.11	Ancillary Techniques	794
61.11.1	Immunohistochemistry	794
61.11.2	Ultrastructure	794
61.11.3	Genetics	794
61.12	Prognosis	794
61.13	Treatment	794
	Suggested Reading	795
62	“Brown Tumor” of Hyperparathyroidism	797
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
62.1	Definition	797
62.2	Synonyms	797
62.3	Etiology	797
62.4	Epidemiology	797
62.5	Sites of Involvement	797
62.6	Clinical Symptoms and Signs	797

62.7	Imaging Features	798
62.7.1	Radiographic Features	798
62.7.2	CT Features	801
62.7.3	MRI Features	801
62.7.4	Bone Scan Features	801
62.8	Imaging Differential Diagnosis	801
62.9	Pathology	802
62.9.1	Gross Features	802
62.9.2	Histological Features	802
62.10	Pathologic Differential Diagnosis	804
62.11	Prognosis	805
62.12	Treatment	805
	Suggested Reading	805
63	Avulsion Injury	807
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
63.1	Definition	807
63.2	Synonyms	807
63.3	Etiology	807
63.4	Epidemiology	807
63.5	Sites of Involvement	807
63.6	Clinical Symptoms and Signs	807
63.7	Imaging Features	807
63.7.1	Radiographic and CT Features	807
63.7.2	Bone Scan Features	808
63.8	Imaging Differential Diagnosis	808
63.9	Pathology	808
63.9.1	Gross Features	808
63.9.2	Histological Features	809
63.10	Pathologic Differential Diagnosis	809
63.11	Prognosis	810
63.12	Treatment	810
	Suggested Reading	810
64	Bizarre Parosteal Osteochondromatous Proliferation	811
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
64.1	Definition	811
64.2	Synonym	811
64.3	Etiology	811
64.4	Epidemiology	811
64.5	Sites of Involvement	811
64.6	Clinical Symptoms and Signs	811
64.7	Imaging Features	811
64.7.1	Radiographic and CT Features	811
64.7.2	MRI Features	811
64.8	Imaging Differential Diagnosis	812
64.9	Pathology	812
64.9.1	Gross Features	812
64.9.2	Histological Features	814
64.10	Pathologic Differential Diagnosis	815
64.11	Genetics	819
64.12	Prognosis	819
64.13	Treatment	819
	Suggested Reading	819

65	Fibro-Osseous Pseudotumor of Digits	821
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
65.1	Definition	821
65.2	Synonyms	821
65.3	Epidemiology	821
65.4	Sites of Involvement	821
65.5	Clinical Symptoms and Signs	821
65.6	Imaging Features	821
65.6.1	Radiographic and CT Features	821
65.6.2	MRI Features	821
65.6.3	Bone Scan Features	821
65.7	Imaging Differential Diagnosis	821
65.8	Pathology	822
65.8.1	Gross Features	822
65.8.2	Histological Features	822
65.9	Pathologic Differential Diagnosis	822
65.10	Prognosis	823
65.11	Treatment	823
	Suggested Reading	824
66	Subungueal Exostosis	825
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
66.1	Definition	825
66.2	Etiology	825
66.3	Epidemiology	825
66.4	Sites of Involvement	825
66.5	Clinical Symptoms and Signs	825
66.6	Imaging Features	825
66.6.1	Radiographic Features	825
66.7	Imaging Differential Diagnosis	825
66.8	Pathology	826
66.8.1	Gross Features	826
66.8.2	Histological Features	826
66.9	Pathologic Differential Diagnosis	826
66.10	Genetics	828
66.11	Prognosis	828
66.12	Treatment	828
	Suggested Reading	828
67	Stress Fracture	829
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
67.1	Definition	829
67.2	Synonyms	829
67.3	Etiology	829
67.4	Epidemiology	829
67.5	Sites of Involvement	829
67.6	Clinical Symptoms and Signs	829
67.7	Imaging Features	829
67.7.1	Radiographic Features	829
67.7.2	CT Features	829

67.7.3	MRI Features	830
67.7.4	Bone Scan Features	830
67.8	Imaging Differential Diagnosis	830
67.9	Pathology	832
67.9.1	Gross Features	832
67.9.2	Histological Features	832
67.10	Pathologic Differential Diagnosis	832
67.11	Prognosis	832
67.12	Treatment	832
	Suggested Reading	833
68	Bone Infarct	835
	Liliana G. Olvi, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
68.1	Definition	835
68.2	Synonyms.	835
68.3	Etiology	835
68.4	Sites of Involvement.	835
68.5	Clinical Symptoms and Signs	835
68.6	Imaging Features	835
68.6.1	Radiographic and CT Features.	835
68.6.2	MRI Features	837
68.6.3	Bone Scan Features	837
68.7	Imaging Differential Diagnosis	837
68.8	Pathology	839
68.8.1	Gross Features	839
68.8.2	Histological Features	839
68.9	Pathologic Differential Diagnosis	843
68.10	Prognosis	843
68.11	Treatment	843
	Suggested Reading	849
69	Paget's Disease of Bone, and Sarcoma Complicating Paget's Disease	851
	Liliana G. Olvi, Maria L. Gonzalez, Isabela W. da Cunha, Eduardo Santini-Araujo, and Ricardo K. Kalil	
69.1	Definition	851
69.2	Synonyms.	851
69.3	Etiology	851
69.4	Epidemiology.	851
69.5	Sites of Involvement.	852
69.6	Clinical Symptoms and Signs	852
69.7	Imaging Features	852
69.7.1	Radiographic Features	852
69.7.2	CT Features	860
69.7.3	MRI Features	860
69.7.4	Bone Scan Features	862
69.8	Imaging Differential Diagnosis	862
69.9	Pathology	863
69.9.1	Gross Features	863
69.9.2	Histological Features	863
69.10	Pathologic Differential Diagnosis	868
69.11	Ancillary Techniques	869
69.12	Prognosis	869
69.13	Treatment	869
	Suggested Reading	870

70 Gaucher Disease	871
Michael J. Klein	
70.1 Definition	871
70.2 Synonyms	871
70.3 Etiology	871
70.4 Epidemiology	871
70.5 Sites of Involvement	871
70.6 Clinical Symptoms and Signs	872
70.7 Imaging Features	872
70.7.1 Radiographic Features	872
70.7.2 MRI Features	872
70.8 Imaging Differential Diagnosis	872
70.9 Pathology	874
70.9.1 Gross Features	874
70.9.2 Histological Features	874
70.9.3 Pathologic Differential Diagnosis	876
70.10 Ancillary Techniques: Genetics	876
70.11 Prognosis	876
70.12 Treatment	876
Suggested Reading	878
71 Gout	879
Michael J. Klein	
71.1 Definition	879
71.2 Synonyms	879
71.3 Etiology	879
71.4 Epidemiology	879
71.5 Sites of Involvement	879
71.6 Clinical Symptoms and Signs	880
71.7 Imaging Features	880
71.7.1 Radiographic Features	880
71.7.2 CT Features	881
71.7.3 MRI Features	881
71.8 Imaging Differential Diagnosis	881
71.9 Pathology	881
71.9.1 Gross Features	881
71.9.2 Histological Features	881
71.9.3 Pathologic Differential Diagnosis	883
71.10 Prognosis	886
71.11 Treatment	886
Suggested Reading	887
72 Osteomyelitis	889
Michael J. Klein	
72.1 Definition	889
72.2 Synonyms	889
72.3 Etiology	889
72.4 Epidemiology	889
72.5 Sites of Involvement	889
72.6 Clinical Symptoms and Signs	890
72.7 Imaging Features	890
72.7.1 Radiographic Features	890
72.7.2 Bone Scan	890
72.7.3 CT Features	890
72.7.4 MRI Features	890

72.8	Imaging Differential Diagnosis	890
72.9	Pathology	891
72.9.1	Pathophysiology	891
72.9.2	Gross Features	893
72.9.3	Histological Features	894
72.9.4	Pathologic Differential Diagnosis	894
72.10	Prognosis	896
72.11	Treatment	900
	Suggested Reading	900
73	Amyloidosis in Bone	901
	Edward McCarthy	
73.1	Definition	901
73.2	Etiology	901
73.3	Clinical Features of Amyloidosis in Patients with Plasma Cell Dyscrasia	901
73.3.1	Epidemiology	901
73.4	Clinical Features	901
73.4.1	Sites of Involvement	901
73.4.2	Epidemiology	901
73.4.3	Radiographic Features	901
73.5	Image Differential Diagnosis	902
73.6	Pathology	902
73.6.1	Histologic Features	902
73.6.2	Treatment and Prognosis	903
73.7	Clinical Features of Amyloidosis in Patients with Chronic Renal Failure	903
73.7.1	Epidemiology	903
73.7.2	Sites of Involvement	903
73.8	Image Diagnosis	903
73.8.1	Radiographic Features	903
73.8.2	MRI Features	903
73.8.3	Image Differential Diagnosis	903
73.8.4	Pathologic Features	903
73.9	Treatment and Prognosis	903
	Suggested Reading	903
74	Mastocytosis	905
	S. Fiona Bonar and Edward McCarthy	
74.1	Definition	905
74.2	General Features	905
74.2.1	Classification (WHO 2017)	905
74.3	Synonyms	905
74.4	Etiology	905
74.5	Epidemiology	906
74.6	Sites of Involvement	906
74.7	Clinical Signs and Symptoms	906
74.8	Image Diagnosis	907
74.8.1	CT Features	908
74.8.2	MRI Features	908
74.8.3	Bone Scan	908
74.8.4	Image Differential Diagnosis	908
74.9	Pathology	909
74.9.1	Gross Features	909
74.9.2	Histological Features	909

74.9.3	Ancillary Techniques	910
74.9.4	Pathological Differential Diagnosis	913
74.10	Prognosis	913
74.11	Treatment	913
	Further Reading	914
75	Erdheim-Chester Disease	915
	Edward McCarthy	
75.1	Definition	915
75.2	Synonyms	915
75.3	Etiology	915
75.4	Clinical Features	915
75.4.1	Epidemiology	915
75.4.2	Sites of Involvement	915
75.4.3	Clinical Symptoms and Signs	915
75.5	Image Diagnosis	915
75.5.1	Radiographic Features	915
75.6	Image Differential Diagnosis	915
75.7	Pathology	915
75.7.1	Pathologic Differential Diagnosis	917
	Suggested Reading	917
76	Rosai-Dorfman Disease	919
	Edward McCarthy	
76.1	Definition	919
76.2	Synonyms	919
76.3	Clinical Features	919
76.3.1	Epidemiology	919
76.3.2	Sites of Involvement	919
76.3.3	Clinical Signs and Symptoms	919
76.4	Image Diagnosis	919
76.4.1	Radiographic Features	919
76.4.2	Image Differential Diagnosis	919
76.5	Pathology	919
76.5.1	Pathologic Differential Diagnosis	920
76.6	Treatment and Prognosis	920
	Suggested Reading	921
77	Transient Osteoporosis	923
	Edward McCarthy	
77.1	Definition	923
77.2	Synonyms	923
77.3	Etiology	923
77.4	Clinical Features	923
77.4.1	Sites of Involvement	923
77.4.2	Clinical Signs and Symptoms	923
77.5	Image Diagnosis	923
77.5.1	Radiologic Features	923
77.6	Image Differential Diagnosis	923
77.7	Pathologic Features	924
77.8	Pathologic Differential Diagnosis	924
77.9	Prognosis	924
77.10	Treatment	924
77.11	Images	925
	Suggested Reading	925

78	Traumatic Osteolysis	927
	Edward McCarthy	
78.1	Definition	927
78.2	Synonyms	927
78.3	Etiology	927
78.4	Clinical Features	927
	78.4.1 Epidemiology	927
	78.4.2 Sites of Involvement	927
78.5	Clinical Symptoms and Signs	927
78.6	Image Diagnosis	927
	78.6.1 Radiographic Features	927
	78.6.2 MRI Features	927
78.7	Image Differential Diagnosis	928
78.8	Pathology	928
	78.8.1 Histologic Features	928
78.9	Pathologic Differential Diagnosis	929
78.10	Treatment	929
	Suggested Reading	929
79	Chest Wall Hamartoma	931
	Ricardo K. Kalil	
79.1	Definition	931
79.2	Synonyms	931
79.3	Etiology	931
79.4	Epidemiology	931
79.5	Sites of Involvement	931
79.6	Clinical Symptoms and Signs	931
79.7	Imaging Features	931
	79.7.1 Radiographic Features	931
	79.7.2 CT and MRI Features	931
79.8	Imaging Differential Diagnosis	932
79.9	Pathology	932
	79.9.1 Gross Features	932
	79.9.2 Histological Features	932
79.10	Pathologic Differential Diagnosis	933
79.11	Genetics	933
79.12	Prognosis	933
79.13	Treatment	934
	Suggested Reading	934
Part XVII Tumors and Tumor-like Lesions of Joints		
80	Synovial Chondroma	937
	Eduardo Santini-Araujo and Ricardo K. Kalil	
80.1	Definition	937
80.2	Synonyms	937
80.3	Etiology	937
80.4	Epidemiology	937
80.5	Sites of Involvement	937
80.6	Clinical Symptoms and Signs	937
80.7	Imaging Features	937
	80.7.1 Radiographic and CT Features	937
	80.7.2 MRI Features	937

80.8	Imaging Differential Diagnosis	938
80.9	Pathology	938
80.9.1	Gross Features	938
80.9.2	Histological Features	938
80.10	Pathologic Differential Diagnosis	939
80.11	Ancillary Techniques	939
80.11.1	Genetics	939
80.12	Prognosis	939
80.13	Treatment	939
	Suggested Reading	939
81	Chondrosarcoma of the Synovium	941
	Franco Bertoni, Patrizia Bacchini, and Ricardo K. Kalil	
81.1	Definition	941
81.2	Synonyms.	941
81.3	Etiology	941
81.4	Epidemiology.	941
81.5	Sites of Involvement.	941
81.6	Clinical Symptoms and Signs	941
81.7	Imaging Features	942
81.8	Imaging Differential Diagnosis	942
81.9	Pathology	943
81.9.1	Gross Features	943
81.9.2	Histologic Features.	943
81.10	Pathologic Differential Diagnosis	944
81.11	Ancillary Methods	945
81.12	Prognosis	945
81.13	Treatment.	945
	References.	945
82	Synovial Chondromatosis.	947
	Eduardo Santini-Araujo and Ricardo K. Kalil	
82.1	Definition	947
82.2	Synonyms.	947
82.3	Etiology	947
82.4	Epidemiology.	947
82.5	Sites of Involvement.	947
82.6	Clinical Symptoms and Signs	947
82.7	Imaging Features	948
82.7.1	Radiographic Features	948
82.7.2	CT Features	950
82.7.3	MRI Features	950
82.8	Imaging Differential Diagnosis	950
82.9	Pathology	951
82.9.1	Gross Features	951
82.9.2	Histological Features	952
82.10	Pathologic Differential Diagnosis	953
82.11	Ancillary Techniques	953
82.11.1	Genetics	953
82.12	Prognosis	953
82.13	Treatment.	953
	Suggested Reading	958

83	Synovial Lipoma	959
	Eduardo Santini-Araujo and Ricardo K. Kalil	
83.1	Definition	959
83.2	Etiology	959
83.3	Epidemiology	959
83.4	Sites of Involvement	959
83.5	Clinical Symptoms and Signs	959
83.6	Imaging Features	959
	83.6.1 Radiographic Features	959
	83.6.2 CT Features	959
	83.6.3 MRI Features	959
83.7	Imaging Differential Diagnosis	959
83.8	Pathology	960
	83.8.1 Gross Features	960
	83.8.2 Histological Features	960
83.9	Pathologic Differential Diagnosis	960
83.10	Prognosis	960
83.11	Treatment	960
	Suggested Reading	960
84	Synovial Lipomatosis	963
	Eduardo Santini-Araujo and Ricardo K. Kalil	
84.1	Definition	963
84.2	Synonyms	963
84.3	Etiology	963
84.4	Epidemiology	963
84.5	Sites of Involvement	963
84.6	Clinical Symptoms and Signs	963
84.7	Imaging Features	963
	84.7.1 Radiography and CT Features	963
	84.7.2 MRI Features	963
84.8	Imaging Differential Diagnosis	965
84.9	Pathology	965
	84.9.1 Gross Features	965
	84.9.2 Histological Features	965
84.10	Pathologic Differential Diagnosis	965
84.11	Prognosis	966
84.12	Treatment	966
	Suggested Reading	966
85	Synovial Vascular Tumors	967
	Yaxia Zhang and Andrew E. Rosenberg	
85.1	Definition	967
85.2	Synonyms	967
85.3	Etiology	967
85.4	Epidemiology	967
85.5	Sites of Involvement	967
85.6	Clinical Symptoms and Signs	967
85.7	Imaging Features	967
	85.7.1 Radiographic Features	967
	85.7.2 MRI Features	968
85.8	Pathology	968
	85.8.1 Gross Features	968
	85.8.2 Histological Features	968

85.9	Differential Diagnosis	969
85.10	Ancillary Techniques	969
85.11	Prognosis	969
85.12	Treatment	969
	Suggested Reading	971
86	Synovial Sarcoma	973
	Liliana G. Olvi, Maria L. Gonzalez, Blas Dios, and Ricardo K. Kalil	
86.1	Definition	973
86.2	Synonyms	973
86.3	Etiology	973
86.4	Epidemiology	973
86.5	Sites of Involvement	973
86.6	Clinical Symptoms and Signs	973
86.7	Imaging Features	975
	86.7.1 Radiography and CT Features	975
	86.7.2 MRI Features	975
86.8	Imaging Differential Diagnosis	975
86.9	Pathology	975
	86.9.1 Gross Features	975
	86.9.2 Histological Features	977
86.10	Pathologic Differential Diagnosis	979
86.11	Ancillary Techniques	980
	86.11.1 Immunohistochemistry	980
	86.11.2 Genetics	982
	86.11.3 Transmission Electron Microscopy	984
86.12	Prognosis	984
86.13	Treatment	984
	Suggested Reading	987
87	Giant Cell Tumor of Tendon Sheath: Localized and Diffuse Types	989
	Liliana G. Olvi, Eduardo Santini-Araujo, and Ricardo K. Kalil	
87.1	Giant Cell Tumor of Tendon Sheath, Localized Type	989
	87.1.1 Definition	989
	87.1.2 Synonyms	989
	87.1.3 Etiology	989
	87.1.4 Epidemiology	989
	87.1.5 Sites of Involvement	989
	87.1.6 Clinical Symptoms and Signs	989
	87.1.7 Imaging Features	989
	87.1.8 Imaging Differential Diagnosis	990
	87.1.9 Pathology	990
	87.1.10 Pathologic Differential Diagnosis	992
	87.1.11 Ancillary Techniques: Genetics	993
	87.1.12 Prognosis	993
	87.1.13 Treatment	993
87.2	Giant Cell Tumor of Tendon Sheath, Diffuse Type	993
	87.2.1 Definition	993
	87.2.2 Synonyms	993
	87.2.3 Etiology	993
	87.2.4 Epidemiology	993
	87.2.5 Sites of Involvement	993
	87.2.6 Clinical Symptoms and Signs	993
	87.2.7 Imaging Features	993

87.2.8	Imaging Differential Diagnosis	994
87.2.9	Pathology	994
87.2.10	Pathologic Differential Diagnosis	997
87.2.11	Ancillary Techniques: Genetics	997
87.2.12	Prognosis	997
87.2.13	Treatment	997
	Suggested Reading	999
88	Hoffa's Disease	1001
	Ricardo K. Kalil and Eduardo Santini-Araujo	
88.1	Definition	1001
88.2	Synonyms.	1001
88.3	Etiology	1001
88.4	Epidemiology.	1001
88.5	Sites of Involvement.	1001
88.6	Clinical Symptoms and Signs	1001
88.7	Imaging Features	1001
88.7.1	Radiographic and CT Features.	1001
88.7.2	MRI Features	1001
88.8	Pathology	1001
88.8.1	Gross Features	1001
88.8.2	Histological Features	1001
88.9	Prognosis	1002
88.10	Treatment	1002
	Suggested Reading	1002