

PREFACE

The book *Advancements in Cancer Research* focuses on selected areas of Oral and Maxillofacial Oncology, Radiation Oncology, Pediatric Oncology, and Hematological Oncology. The contents are primarily designed for clinicians, although basic scientists will also find considerable value.

Chapter 1 explores osteoradionecrosis of the jaws, a severe side effect observed in 2-22% of patients undergoing radiation therapy or concurrent chemoradiotherapy for head and neck cancers. There is currently no consensus on the precise diagnosis of this condition. The chapter enhances our understanding of its clinical and radiological features, presenting strategies for accurate diagnosis, with particular emphasis on radiological and nuclear medicine techniques.

Chapter 2 focuses on radiation-induced trismus, a debilitating consequence of radiotherapy in patients with head and neck cancers, which interferes with daily activities such as eating, speaking, chewing, and maintaining oral hygiene. This chapter elucidates current concepts, debates surrounding the definitions, and challenges encountered in managing this condition due to variations in these definitions.

Chapter 3 addresses quality of life as a significant concern arising from radiotherapy, which often leads to facial deformity, pain, fractures, devitalized bone, fistulas, dysesthesia or anesthesia, trismus, and difficulties in chewing and swallowing, along with localized or systemic infections. This chapter compiles data on the physical, social, and emotional effects of osteoradionecrosis of the jaws as determined by general or specific quality of life surveys of head and neck cancer.

Chapter 4 evaluates novel advances in the treatment of brain metastases, a condition observed in approximately 30% of solid tumor cases. Given the limited success rates of traditional surgery and whole brain radiotherapy, stereotactic radiosurgery has emerged as an alternative, either alone or in conjunction with other treatments. This chapter assesses the efficacy and safety of combining innovative immunotherapies with stereotactic radiosurgery. Chapter 5 further explores the topic of brain metastasis treatment advancements, providing evidence and rationale for the innovative use of preoperative stereotactic radiosurgery.

Chronic lymphocytic leukemia, the most prevalent leukemia in Western countries, is addressed in Chapter 6. Despite advancements in treatment, the condition remains incurable. The chapter examines recent studies that identify differences in the epigenetic and regulatory landscape and the potential of optical genome mapping to improve diagnostic and patient care practices.

Chapter 7 tackles the challenges and advances in treating neuroblastoma, an embryonal tumor more prevalent in infants that arises from pluripotent sympathetic cells known as neuroblasts. This chapter focuses on the heterogeneity of this pediatric neoplasm, with particular attention to putative cancer stem cells.

Multiple tooth loss, a common side effect of radiotherapy for head and neck cancers, is addressed in Chapter 8. Implant-supported dental prostheses have emerged as a reliable oral rehabilitation option for patients who have undergone

radiation therapy. This chapter offers a multidisciplinary perspective on the applications, ideal timing, and considerations of dental implants in patients with head and neck cancer.

Finally, Chapter 9 explores the significant contribution of tissue microarrays to the study of numerous tissue samples on a single slide. This technique has been adapted to single cells, evolving into cell microarrays with considerable potential for drug screening. The chapter discusses the main technical aspects of cell microarray construction, its benefits and limitations, and its potential applications in the screening and monitoring of phenotypic modifications and biomarkers in cancer cell lines under various therapeutic conditions.

I extend my deepest gratitude to all the contributing authors for their exceptional inputs and the time they have devoted to this book. The diverse topics covered in Oral and Maxillofacial Oncology, Radiation Oncology, Pediatric Oncology, and Hematological Oncology will provide a comprehensive resource for clinicians in their ongoing pursuit of improving cancer patient care. In addition, basic scientists will find a wealth of useful information, particularly in the realm of cell microarrays, to further their research in this ever-evolving field.

I sincerely hope this book serves as an enlightening guide, contributing significantly to our collective understanding of cancer research advancements and fueling further explorations and breakthroughs in the field.

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