

Cancer of the Head and Neck



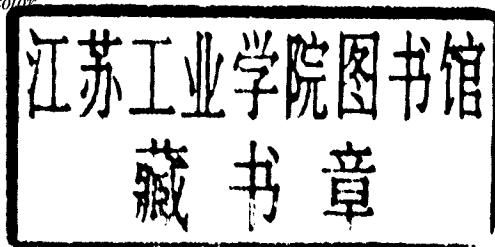
Stephan Ariyan, M.D.

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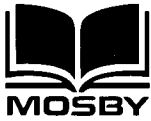
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This book is dedicated to my grandfather

Armenag K. Bedevian

who had the earliest influence on my childhood interest in becoming a "scientist." He was a botanist in charge of cotton experimentation and published his *Illustrated Polyglottic Dictionary of Plant Names* in 1936, listing over 3600 plants in eight languages. I remember very clearly visiting him as a 6- or 7-year-old during his retirement and watching him spend several hours each day working on his subsequent work, an encyclopedia of plants. Unfortunately, he died before he completed this monumental task, but he clearly impressed me with his joy of science and his pleasure in writing about his field.

I have taken the liberty of using a quote by Sir J. Sinclair from the inside cover of my grandfather's book:

He who introduces a new and useful seed,
plant or shrub into his district is a blessing and honour
to his Country.

This is appropriate to the success of any educator who wishes to pass on knowledge and encourage others to become teachers. My grandfather certainly had that lasting influence on me.

PREFACE

Cancers of the head and neck cover a vast number of possibilities in their presentation. As a result, their management may require surgical treatment, therapeutic radiation, or a combination of the two modalities, with or without adjuvant therapy. The ultimate goal of management should be cure, but in this approach, the responsible physician should also obtain the best functional and cosmetic results for the patient. In no other area of medicine does the "team approach" reach the significance it does in the care of the patient with head and neck cancer. These patients frequently have a number of medical problems that require the attention of a number of specialists.

This book is divided into two parts: General Principles and Clinical Management. Part One, Chapters 1 through 9, explores the basic concepts needed to gain understanding of the history, pathology, epidemiology, and biology of the head and neck; the cancers found there; and the mechanisms of treatment. The chapters in Part Two detail the specific anatomic regions involved and offer pertinent treatment information, including both surgical and radiotherapeutic modalities.

What sets this book apart from other ex-

cellent books on this subject is that each anatomic site is discussed separately and from the point of view of the surgeon and the radiotherapist within the same chapter. In this manner the reader can evaluate the two or more opinions on the management of a particular site at the same time, rather than searching back and forth between sections on extirpation, reconstruction, and irradiation.

This book was prompted by my experiences over the past 10 years in the management of these patients at Yale. The modifications and advances in the treatment of head and neck cancer in New Haven are a result of the excellent cooperation among all my colleagues. The presentations at various national and international meetings have afforded me the opportunity to meet a number of the authorities in our field. Understandably, any clinician's approach to treatment is modified over time by personal experiences, as well as experiences of colleagues. These various meetings have therefore been meaningful to each of us in the sharing of our experiences and our knowledge.

I believe it was natural for this book to be written to express all our philosophical approaches to the management of these pa-

tients. I say "philosophical" because all too often clinicians have different opinions regarding the treatment of a specific case, and the ultimate decision is based on the discussion of those various opinions. It is not surprising that there are some differences of opinion in the various chapters of this book, but each author was instructed to discuss the reasons behind the opinions. In the accomplishment of this, there has been

some overlap of material, but it is a necessary overlap that allows the authors to present their subjects properly.

It is my hope that the experiences of all the authors of this book will be relevant to the practice of the clinicians who read it, and will ultimately lead to a better quality of life for all of our patients.

Stephan Ariyan

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PART ONE

GENERAL PRINCIPLES

CHAPTER 1

HISTORICAL PERSPECTIVE

Stephan Ariyan

The diagnosis and treatment of head and neck cancers today have evolved from the extensive experience gained over the last century. Current techniques incorporate surgical, radiation, and chemotherapeutic methods into the multidisciplinary management philosophy to offer a comprehensive treatment plan for head and neck malignancies.

SURGERY

The first management approaches were surgical. These early surgical treatments were limited mostly to cancers of the larynx, with Billroth performing the first successful total laryngectomy for cancer on New Year's Eve, 1873.²² However, the mortality from hemorrhage, shock, infection, and pneumonia following these procedures exceeded 25% during the period between 1870 and 1880.²¹ In 1884 former president Ulysses S. Grant was found to have a cancer of the tonsil, metastatic to the cervical lymph nodes. The surgeons who examined him (J.H. Douglas, Henry B. Sands, and George F. Shrady) considered an operation to remove the cancer that would have required splitting the mandible in the midline, removing the entire tongue and a greater part of the soft palate with the tumor in the tonsil, and dissecting the submandibular nodes. Although the opera-

tion was considered mechanically feasible, in spite of the "close proximity and probable involvement of the tissues adjoining the large arteries and veins . . . , in the best interests of the distinguished patient the surgeons did not feel inclined to recommend the procedure. . . ."⁴¹

The inevitable complications of wound breakdown and sepsis led the surgeons of the early part of this century to devise two-stage operations for total laryngectomies.²⁶ In the United States Crile¹⁸ reported on his experience with 132 operations for cancer of the head and neck, noting that in 4500 autopsies of patients with cancer of the head and neck less than 1% had metastases to distant organs. He therefore advocated and designed the systematic operation for the radical block excision of the regional lymphatics in the neck. Patients with resection of both primary tumors and nodes had a 25% greater 3-year survival rate than those with resection of the primary lesion alone.

In England Butlin,¹⁵ in 100 cases of cancer of the tongue, not only resected the tongue, but sometimes also extended the operation to include a portion of the mandible and submaxillary lymph nodes, following the technique of Kocher.²⁵

In the late 1930s and early 1940s several significant advances in medicine

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permitted surgery to safely extend cancer operations and thereby achieve better cure rates. As antibacterial chemotherapy with sulfa drugs and later with antibiotics enjoyed greater use, wound infections and sepsis could be treated, permitting wounds to heal properly. The introduction of intravenous pentothal aided the induction of anesthesia. Inhalation anesthetics through the nasotracheal tube, which were first employed by Crile,¹⁷ also improved surgical conditions. Finally, the typing of human blood and the establishment of blood banks permitted the safe replacement of operative blood loss.

These landmark advances in medicine permitted the more radical "commando" operations devised by Martin²⁹ at Memorial Hospital in New York:

Such combination operations—resection of the primary lesion with the mandible and neck dissection (first begun in 1939) were being performed regularly in the Head and Neck Service of Memorial Hospital in 1942, the year of the Allied Commando raids in Dieppe. For want of a better designation, they were termed "Commandos" by the housestaff, and this generic term has persisted since in the form of "Commando floor of mouth," "Commando tongue," "Commando larynx," and so forth.

RADIATION

The rapid development of surgical treatment for head and neck cancers at the turn of the century was paralleled by simultaneous advances in the field of radiotherapy. Not long after Roentgen's discovery of the x-ray, this field expanded its capabilities from diagnosis to treatment. Unfortunately, specialists in both surgery and radiation failed to see the advantages of combining the two treatments.

In a 1909 report Butlin¹⁵ stated that he had seen two cases treated by the application of radium; the treatment of a cancer of the tongue was not successful, but a cancer of the buccal mucosa showed marked regression. Butlin felt this modality could be used for early lesions in the tongue and

oral cavity, but believed surgery would still be needed for the cancers metastatic to the lymph nodes in the neck. In the early years radium was used externally for cancer patients, and then interstitially as needles. Use was further improved by the dosage tables established by Paterson and Parker,^{36,37} which are still used by radiotherapists today.

In the 1920s the 200 kV x-ray machine was developed and was used therapeutically against cancer. However, the local complications from this treatment led Coutard¹⁶ to administer the radiation in divided doses over a period of 3 weeks; this became the accepted treatment, replacing single-dose techniques. Baclesse^{10,11} felt that the central tumor was more radioresistant and needed a higher dose than the periphery of the tumor and advocated an extension of the time for the treatment to 6, 8, or 10 weeks. These time-dose relationships were further elaborated on by Strandqvist⁴⁴ and finally led to the widespread acceptance of Paterson's treatment³⁵ using the optimal dose of 5500 rad delivered in divided doses over 5 weeks.

The development of the supervoltage machines further improved the course of patients treated with radiation therapy. These higher-energy photons spared the skin on the surface while treating the tumor within.¹⁴ Some centers combined surgical treatment with radiation therapy; results improved with experience at the Curie Institute in Paris,²⁷ at the Princess Margaret Hospital in Toronto,⁴⁷ and at the M.D. Anderson Hospital in Houston.²⁰ However, complications also increased as therapeutic approaches were hampered by the nature of the oral cavity, which has abundant, highly virulent, bacterial flora. Both aerobic and anaerobic species are present, with counts of from 10^7 to 10^8 /ml.^{33,39} Although the mortality from a routine neck dissection is low, it increases if an accompanying intraoral dissection is performed in continuity,^{12,18} allowing the development and spread of infection. The pa-

tient consequently has higher infection rates, flap slough, and fistula formation.^{23,24,48}

These complications led to the evaluation of the results of the combination of surgery with preoperative or postoperative radiation. A retrospective analysis at the M.D. Anderson Hospital demonstrated equal survival rates in both groups, but a lower complication rate among the patients treated with postoperative radiation.²⁸ In prospective randomized trials this advantage of postoperative radiation has appeared to persist for cancers at various sites in several reports.^{9,43,46} In addition, much higher doses of radiation can be administered postoperatively to both the primary tumor and regional lymphatics than if it is given preoperatively.

CHEMOTHERAPY

That chemotherapy could be used as an adjuvant to radiation therapy or surgery to improve the results has been an appealing concept and has stimulated investigations in patients with advanced primary tumors and regional nodal involvement.³² In particular, the clinical effectiveness of methotrexate in oropharyngeal cancers was demonstrated by Sullivan, Miller, and Sikes⁴⁵ in 1959. Although many chemotherapeutic agents and various combinations have been available over the years, randomized trials comparing combination chemotherapy to single-agent treatment have failed to show a superiority for polychemotherapy regimens in head and neck cancer, and methotrexate is still considered by many to be the most effective single agent for these cancers.¹³ Overall, the early reports on the chemotherapeutic approach have demonstrated conflicting data on the usefulness of chemotherapy as an adjuvant. Further well-controlled trials are necessary to evaluate the effects on various parameters.

MULTIDISCIPLINARY APPROACH

The simultaneous development of the various therapeutic modalities has made

close communication among specialists in this area of primary importance for the successful management of patients with head and neck cancers. It is therefore imperative that specialists in a range of disciplines evaluate the patient in a cooperative manner with collective opinions based on previous experiences with similar situations. Specialists at many medical centers have developed tumor boards for facilitating tumor evaluation and recommendations for treatment.

An example of a combined approach can be seen in the use of musculocutaneous flaps for head and neck cancers. Some remarkable achievements in reconstruction have been possible.* Advanced cases of cancer in the area of the skull base can now be resected with safety, reconstructed in one stage, and treated with large doses of postoperative radiation.^{5,8,40} The infections and tissue breakdown resulting from surgery following radiation failures can now be resected and covered with safe flaps that can bring a new blood supply to permit systemic antibiotics to reach the area and allow the wounds to heal.¹ As a result of these developments in reconstruction, patients with advanced cancer can now anticipate reasonable palliation.

SUMMARY

It is unfortunate, although understandable, that most of the studies of various modalities of treatment are retrospective analyses, for it is difficult to undertake a prospective clinical trial of cancer of the head and neck because of the number of variables. The treatment schedules vary from one institution to another, and even within the same institution the treatments vary within a short number of years. There is great variability in tumor sites and stages. With the TNM (tumor, node, metastasis) classification system, virtually hundreds of possible combinations exist between sites

*References 2, 4, 6, 7, 19, 30, 31, 34, 38.