

The Treatment of Cancer of Mouth and Pharynx

BY

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Treatment of cancer in the mouth and pharynx relied heavily on cautery and escharotics until 1858, when Virchow published "Pathology of Tumors" demonstrating the cellular origin of cancer, and, that abnormal and atypical growths were accounted for by cellular proliferation. He argued, therefore, that complete destruction was necessary to produce a complete cure.

Bilroth (1873) attempted to apply this principle in performing total laryngectomy and partial oesophagectomy on a patient with cancer of the larynx. Other surgeons were appalled by the mutilating effects of this type of surgery and its practice gradually fell into abeyance. Sir H. Butlin of St. Bartholomew's persisted with operative treatment around the turn of the century and although he obtained some good results, they were mainly disappointing. In 1906 the famous American surgeon, George Crile, wrote:

"Though signal advances have been made recently in many surgical problems, the treatment of cancer of the head and neck has, it would seem, never received the attention nor kept the pace of progress in other fields . . . The operative treatment is hampered by tradition and conventionality and the tragic ending of so large a proportion of these cases has held back lay and even professional confidence."

In review of a series of 4 500 autopsies he asserted that most cases of head and neck cancer had died from distant metastases. Therefore he was convinced of the necessity of performing a radical block dissection of the lymphatics of the neck. He adopted this procedure and showed in his small operative series that a patient who had a block dissection had a 25 per cent. better chance of living three years without disease, than one treated for the primary lesion alone.

In the early 20th century radium therapy was at the height of its popularity but enthusiasm moderated on the realisation of its dangers; and, it was replaced in the twenties by the 200 KV Roentgen Ray machine. This machine was initially used to apply a single tumour dose, but later Coutard's method of treating the patient with fractionated doses over a three-week period was almost universally adopted, as it produced fewer side effects.

Hayes Martin and others paved the way for the acceptance of the combined operation for tumours of mouth and pharynx, with their regional cervical node metastases. These extensive surgical procedures based on Virchow's work were feasible, due to progress in anaesthesia, the development of dermatomes and antibiotics, and the establishment of reliable blood banks which came with World War II. Thus it was possible to operate successfully on patients with carcinoma of the head and neck despite the fact that many were old, or, hitherto would have been considered poor surgical risks.

Radiotherapists then took up the running and in 1949 Baclesse extended the period of divided external radiation to six, eight and even ten weeks. In this way he claimed to avoid acute oedema and mucous membrane reactions and still obtain complete remission. Boschke, *et al.* (1950), advocated the usage of the then new discovery, supervoltage irradiation, which possessed superior powers of penetration. In addition, the better tolerance of both the skin and the mucus membranes permitted a more radical treatment course to be administered in a shorter time with less morbidity. In this connection it can be shown by a comparison of isodose curves that the maximum doses of the 250 KV unit and the CO-60 unit occur on the skin surface and four mms beneath the skin surface respectively. Finally in 1951, Wookey, *et al.*, reported on the use of a combination of radiotherapy and surgery in cancer of the mouth, and demonstrated the improved results obtained in this way. Others were encouraged to utilise this method, most notably the New York Memorial Hospital and the M. D. Anderson

Tumor Institute in Texas, and soon published their own series showing improved results.

While the Americans made these great strides, Europe slept, treating most of its patients with radiation. However, it has recently become apparent that some centres appreciate the need for both modalities in the treatment of this devastating disease. In these centres the use of both disciplines has opened wider fields of endeavour and many patients previously considered suitable for palliation only, are now being actively treated and salvaged.

Usually radiation is applied before surgery, to diminish the tumour size; thereby making operation less radical and improving the functional and cosmetic results. It lessens the chance of not removing a sufficiently wide region of normal tissue, as the surgeon is unable to determine the border of microscopic growth at operation. Field cancerisation refers to multiple foci of dyskeratosis and *in situ* cancer which are found on microscopic examination of the normal-looking mucous membrane around a squamous cell carcinoma. This may be responsible for many treatment failures and for the appearance of multiple separate cancers of the mouth.

Most cancers of this area are squamous cell carcinoma. Those of the posterior portion of the pharynx and oral cavity tend to be more anaplastic and aggressive in their clinical behaviour than those of the anterior oral cavity.

There are a number of limitations to the sole use of radiotherapy in the treatment of cancer of the mouth and pharynx.

1. It is generally ineffective in the treatment of adenocarcinoma, sarcoma and melanomata.
2. It is contraindicated for cancers overlying or invading bone because of the sequelae of osteoradionecrosis.
3. It cannot be used for recurrent cancer in an area previously exposed to heavy irradiation.
4. Precancerous lesions adjacent to a tumour are often incompletely eradicated and remain as a threat of further malignant change.
5. It is less effective than surgery in eradicating metastatic cervical node tumours.
6. Its morbidity is slightly higher than that of surgery.
7. Reconstructive procedures can be extremely difficult following heavy irradiation.
8. Post irradiation disease of skin and soft tissues and post irradiation osteogenic sarcoma of bone are possible complications in young patients.

Radiotherapy should be used mainly in the treatment of malignant lymphomas and in the management of certain selected squamous carcinoma, particularly those in relatively inaccessible parts of the mouth, e.g., in the soft palate where there is less functional disturbance following radiation than surgical excision. Radiation not only fails to control the more advanced cancers of the mouth and pharynx, but often fails to produce palliation. The reaction to the irradiation in the tumour and surrounding tissues, may increase the patient's misery.

The choice of irradiation or surgery for cancer, in different locations of the mouth and pharynx is often a controversial subject, and, depends on the histology of the tumour, its bulk, its accessibility and its encroachment on neighbouring structures, particularly bone. By and large it can be stated that radiotherapy should be the method of choice in the following locations:

- (i) Base of Tongue (oropharyngeal tongue);
- (ii) Soft Palate;
- (iii) Early or superficial lesions of the Buccal mucosa, or Tonsil.

Surgery should be employed in all other cases and, of course, operation is necessary should there be metastases to the regional neck nodes. A common mistake is to withhold surgery when it is indicated and resort to radiotherapy because of the age or general condition of the patient.

COMBINED IRRADIATION AND SURGERY

The radiotherapist and the surgeon should join forces in the management of malignant tumours arising in the mouth and pharynx. Being unable to recognise microscopic tumour extensions, the surgeon hesitates to remove large volumes of normal appearing tissue with the tumour, since this would add to the difficulties in rehabilitation of the patient; however, radiotherapy is least effective in the central bulky portion of the tumour where blood supply is often poor and necrosis often present, but the growing periphery has a high oxygen tension and may be controlled.

Suitable cancers are treated by external supervoltage radiation with a tumour dose not exceeding 6000 R. It is wise to mark the tumour extent beforehand by tattooing as a guide to later excision because irradiation produces so much shrinkage on occasions. After four weeks the patient is re-evaluated and surgery is carried out. This consists of excision of primary site and usually a radical neck dissection. Problems with wound healing are more common than in non-irradiated patients, but eventual healing will occur and the complications can be anticipated, and, minimised as experience accumulates.

There is no doubt that surgery is more feasible following supervoltage therapy than therapy in the 250 KV range. Far less successful has been the use of irradiation after surgery. Effective radiotherapy depends on good blood supply and adequate oxygenation of the tissue being treated. When these are not present, radiation will fail. This also explains why radiation is seldom effective in the control of proved recurrences after surgery.

SURGICAL TREATMENT

Melanomas, sarcomas, adenocarcinomas and most squamous cell carcinomas of the oral cavity are best managed surgically. Adequate local excision implying a wide excision of normal mucosa around the lesion and a deep excision of underlying tissues. The surgeon must be ever-mindful of the danger of spilling tumour cells into the wound. Following excision and before repair of the wound, thorough irrigation of the tissues with sterile normal saline is carried out. When the tumour adjoins or overlies bone the surgeon must not hesitate to resect an adequate amount of bone. Cautery was used extensively in the past for excision, but it caused delayed healing, discomfort, infection and often extensive scarring and distortional tissues. Excision with the scalpel followed by careful wound repairs accomplishes more adequate control of the neoplasm and better functional recovery.

Lesions in the anterior part of the mouth usually may be excised through the open mouth. Less accessible lesions require exposure by reflection of an upper cheek flap (Ferguson) or a flap formed by dividing the lower lip and skin of the chin in the midline. Occasionally the body of the mandible must be divided and retracted for access to a lesion in the base of the tongue or tonsil. Surgical treatment of small superficial malignant tumours is followed by minimal functional or cosmetic disturbances. Wide block resections necessitated for the control of more advanced infiltrating lesions result in disturbances in swallowing, speech and appearance which may be minor or severe. These difficulties are at their worst in the few weeks following surgery. A surprising degree of adaptation to the distorted anatomy with recovery of function will then occur in most patients.

The segment of tongue remaining after a hemiglossectomy will shift across the midline. Swallowing becomes more efficient and speech improves. While management of functional and cosmetic disturbances following extensive surgery can be a grave problem, it is far less troublesome than the task of caring for the patient with uncontrolled

intra-oral cancer. Most elderly patients will accept a moderate degree of external deformity or loss of control so long as they are comfortable and able to talk and eat. Patients who have cervical metastasis are best treated by radical neck dissection following completion of radiation therapy to the primary lesion. Some centres administer a tumour dose of 4 000 to 4 500 R over five to seven days. The neck dissection follows four to six weeks later. Other centres use 3 000 over five days and operate one week later.

The classic neck dissection extends from the inferior border of the mandible to the clavicle and from the midline of the neck anteriorly to the anterior border of the trapezius posteriorly. The following structures are removed:

- (i) The lymph nodes and fascia of the area dissected.
- (ii) Sternomastoid muscle.
- (iii) Internal Jugular vein.
- (iv) Omo hyoid muscle.
- (v) The accessory nerve.

The skin flaps are then replaced, drainage installed and moderate pressure dressings applied to the neck. Bilateral neck dissections are frequently carried out without any particular hazard, other than severe postoperative oedema which is not due to loss of both internal jugular veins, but to the loss of lymphatic channels. However, it rapidly subsides and returns to normal in approximately two months. Patients who undergo operations of this nature need tracheostomy and it should be performed before the main procedure.

The public and the profession are only awakening to the need for early diagnosis of cancer of the head and neck. Many are early accessible and more advanced lesions need both radiation and surgery to obtain the optimal results. To accomplish this, a closer liaison between the two specialities is needed. Too frequently the therapist and the surgeon are not fully cognisant of what can be accomplished by the others modality. By recognising and accepting the limitations and advantages of each modality the best may be achieved by both.

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