RATIONAL THERAPY FOR CANCER OF THE LOWER LIP

ELLIS FISCHEL, M.D.

(From the Surgical Service of the Barnard Free Skin and Cancer Hospital, St. Louis, Missouri)

During recent years such a controversy has arisen over proper therapeutic measures to be applied to patients suffering from cancer of the lower lip that it appears pertinent to review the subject in the light of experience gained through twenty-five years in the surgical service of a specialized cancer institution.

The attitude of the general surgeon to the treatment of cancer is best expressed by the biblical quotation, "If thine eye offend thee, pluck it out." If the cancer is out, *thoroughly out*, it cannot kill the patient. This is certainly sound logic, and has stood the test of centuries of surgical practice and thought. But today there is much discussion on two main issues of the subject: should the cancer be destroyed *in situ*, with the conservation of normal tissue, or should normal tissue and cancer be removed together, and, if so, how much normal tissue?

These are difficult problems when applied to individual cases. In a theoretical sense, the ideal operation for the cure of cancer involves the removal of the primary growth with all of the lymphatic vessels and lymph glands which adjoin it, the operation to be performed at one stage and all tissue removed *en bloc*. Such operations have been devised and more or less standardized for cancer of the breast, the uterus, the penis, all extremities, the tongue, and the lower lip. But, however good and logical, from the point of view of eradication of the disease, all these "standard" operations may be, in cancer of the breast alone is radical removal universally accepted as the best method of treatment. Other more rational methods meet the demands for the remaining accessible locations. It is my desire to place before you the present status of such rational methods as applied to cancer of the lower lip.

Whether we accept the embolic theory of dissemination of cancer cells by migration through lymphatic channels or the permeation theory of Handley (8), no study of the individual
cancer patient can disregard a consideration of the possible invasion of lymph vessels and lymph glands which lead from the affected region. The rôle of the lymphatic vessels is clearly that of highways along or through which cancer cells either are carried, suspended in fluid, or are "pushed" or "jammed" by aggregations of cells seeking an outlet along the line of least resistance. The rôle of the lymph glands is not so clear; they may be filters or way stations at which the procession of wandering cancer cells is caught or retarded, or they may be areas of great fertility in which the cancer cell finds conditions especially suitable for growth and proliferation. I subscribe to the former hypothesis and consider the lymph gland as a protection against widespread dissemination.

In the lower lip the course of the lymph vessels which drain all the tissues of the lip is well known (Fig. 1). Also, the lymph glands, which are fairly constant and readily accessible, are known (Fig. 2). The removal or destruction of the entire lower lip, together with the removal of all the lymph-bearing tissue to and with the first bulwark of protecting lymph glands, is anatomically

---

**Fig. 1. Superficial Lymphatic Vessels and Glands Which Drain the Lips (after Porier and Cuneo)**

Note the interlacing immediately beneath the vermilion border and the long distance the vessels course in the superficial fascia before they dip toward the deep structures.
possible and physiologically does no great harm to the patient. Therefore, theoretically at least, under ideal conditions of standardized adequate surgery and complete cooperation of the patient, no one should die of cancer of the lower lip. But we are far from reaching this ideal. A cursory glance at the voluminous literature of the past ten years must lead anyone to the conclusion that there is perfect chaos in the mind of the medical profession as to what constitutes "adequate" treatment of this condition. X-rays, radium, electro-coagulation, electro-desiccation, V-excision, cautery excision, as applied to the primary lesion, all have their warm advocates. Many series of cases have been reported with astounding percentages of "cures" of the primary lesion, and some equally astounding when "metastases" were present. By far the greatest
number of these reports show such an inadequate knowledge of what cancer of the lower lip really is, that the critic must feel that the reporter is carried away by his enthusiasm for a new therapeutic agent, rather than guided by a careful scientific analysis of his cases.

To add to the confusion, Broders (4), through his masterly pathological study, injected a new issue into the treatment of cancer in general, and cancer of the lower lip in particular, by his method of "grading" carcinoma and by showing the close relationship between grading, treatment, and prognosis. The surgeon has been left gasping at the sudden and concentrated onslaught by radiologist, electrotherapist, dermatologist, and, finally, pathologist, upon a domain peculiarly his own. Perhaps, for the most part, he has been relieved to feel that his responsibility has been lessened and that others should be permitted to treat this disease. This, however, is a deplorable state of affairs, for cancer is today primarily a surgical disease, and the surgeon must assume full responsibility for its proper treatment.

What then is the rational treatment of cancer of the lower lip? Obviously, any method which will totally destroy the primary lesion and will remove, or inhibit, the growth of metastases.

Until the advent of the x-ray, surgical removal of the primary lesion and more or less thorough surgical removal of the lymph-bearing tissue of the neck was the only rational therapy. Dowd, Grant, J. Collins Warren, of America, and Kocher, Butlin, and Cheatle, of the European surgeons, made valuable contributions to the subject. Finally, Stewart (16), in 1910, devised an operation which satisfied all the postulates of the ideal, namely, removal at one stage of the primary lesion, wide of its margin, together with all the immediately concerned lymph vessels and glands. Plastic repair of the lip was accomplished at the same sitting, all without submitting the patient to too great risk of operative death. Stewart took cognizance of the fact that the lymphatics of the lip lie in the skin and superficial fascia to the lower margins of the mandible, and that the V-excision was frequently followed by recurrence in the apex of the "V". Dowd, Grant, Warren, and Cheatle, also, had been aware of this danger, but Stewart's operation is the only one which makes such recurrence deep in the skin of the chin practically impossible. In 1923, Leighton (9) again drew attention to this danger of the V-excision; but, due possibly to the fact that cases are seen earlier and biopsy is more and more necessary for diagnostic purposes, the V-excision has
again come into vogue, in spite of Sistrunk's (14) figures showing 11 local recurrences in 98 cases in which the lymph glands were not involved.

It was early recognized that x-ray had a curative value in the treatment of cancer of the skin. It was used by operators, good, bad, and indifferent, on all kinds of skin lesions, many of which were supposed to be cancer but were not; though many basal-cell cancers were undoubtedly cured. Skin cancers having been cured with x-ray, tumors of all kinds were subjected to its influence. Metastatic lymph glands were attacked with enthusiasm, and we soon began to hear about the cancer cells in a lymph node either disappearing or becoming surrounded by a fibrous sheath wherein they lay alive, it is true, but “arrested” and “harmless”! All the while less and less was said about the efficacy of the x-ray when applied to the primary squamous-cell carcinoma of the lip, a part of the anatomy most readily accessible, with no vital structures anywhere near. Yet we are asked to believe that x-ray treatment of the cervical metastases from cancer of the lip, either already present or suspected, is more efficacious than block removal!

Without the desire to enter into a lengthy discussion as to the varying susceptibility of different types of malignant tumor cells to radiation, for the purpose of this paper, which concerns itself purely with squamous-cell carcinoma of the lower lip, we may state as an accepted fact, that the efficacy of radiation either from x-ray or radium is dependent upon a difference in the reaction to radiation between normal cells and cancer cells. Cancer cells can be destroyed by a quantity of radiation which will not quite destroy normal cells. Living tissue offers considerable resistance to the penetration of effective radiation; therefore, in order to obtain an effective destructive “dose” to cancer deep in the tissues, the surface or skin dose must be increased beyond the point of normal tissue tolerance. True, several different portals of entry may be used, but then all the tissues in the immediate neighborhood of the tumor will receive the benefit of the accumulated cross-fire dose, and the squamous-cell carcinoma metastasis is so nearly normal tissue, in its susceptibility to radiation, that it is impossible to destroy the one without irreparable damage to the other. I have observed and have referred many cases of metastatic carcinoma of the cervical lymph nodes to competent radiologists for treatment, but I have never seen or heard of a case in which such metastases, proved to be carcinoma by incon-
trovertible microscopic evidence, disappeared, or were arrested, or in which life was prolonged following x-ray radiation.

At the meeting of the American Radiological Society in Chicago, in December 1928, during the discussion of the value of x-ray in the treatment of carcinoma of the breast, I made the same statement in reference to metastatic nodes from cancer of the breast. My remarks met with many protests. It was gratifying, therefore, to learn that Douglas Quick (12), as recently as April 1929, stated he had not seen complete regression of squamous-cell carcinoma secondary in the nodes, from external radiation alone. It is to be emphasized that these remarks apply to proved metastases and not to glands which are palpably or even visibly enlarged. There is no infallible method by which the presence of carcinoma in lymph nodes can be determined. Positive findings by a competent pathologist give reasonable assurance that cancer is present. Negative findings do not mean there are no cancer cells present, and even with serial sections of all enlarged glands (a procedure manifestly impracticable for any considerable group of cases) a very small nest of cancer cells might be overlooked. Careful examinations of lymph nodes which were palpably enlarged at the time of their operative removal have repeatedly shown more negative findings for carcinoma than positive. This has certainly been true of the material available at the Barnard Free Skin and Cancer Hospital (20 per cent positive). It is equally true that occasional cases are seen which later develop metastasis, even though non-palpable glands removed at operation failed to show metastasis and the primary lesion remains cured. Personally, I believe that the occurrence of such cases is prīma facie evidence that the resection of the lymph-bearing tissue of the neck has not been technically correct. I am not in sympathy with Shedden (13) and others who believe that more radical block dissections are not to be done as a routine measure. Statistics, which invariably show 10 to 40 per cent more “cures” for cases in which block dissections have been done, even though no cancer was found on microscopic examination, than parallel groups in which no neck dissection was done, are convincing enough. Crossed metastases are not uncommon. The first network of glands and lymph vessels which prevents deep metastases can be thoroughly removed without great difficulty, a death-rate practically nil, and very slight resultant deformity. As a general working principle in the treatment of cancer, especially cancer of
the lip, I believe the patients' chances of cure are from 50 to 75 per cent greater if the operative procedure can be planned to keep a step ahead instead of running after the cancer.

My remarks thus far have concerned themselves largely with the problem of the lymph glands. The primary lesion of the lip itself presents no great problem. Any method of treatment which totally removes all the involved tissue is a rational one. Cosmetic appearance, as the result of thorough local removal, should never be a consideration. Plastic procedures are available for the restoration of any amount of lost tissue, and a recurrent carcinoma will in a short time thoroughly mutilate the best cosmetic result.

Carcinoma of the lip differs from carcinoma on other skin or mucous membranes only in the direction and spread of its tributary lymph vessels. It should be remembered that the vessels which drain the skin of this region run downward and outward for a considerable distance in the skin and superficial fascia. The V-excision should be limited, therefore, to growths 15 mm. or less in extent and the apex of the V should be as far distant from the growth as the linear extent of the excised lip.

I do not believe that this or that method of treatment can be described dogmatically as the "best." The local manifestations of the disease are so varied, and effective removal of the local lesion can present so many problems, that the surgeon should be familiar with the possibilities and limitations of a number of agents of destruction. But we should always remember that cancer of the lip is a surgical disease, and that the amount of cancer-bearing tissue to be destroyed is the same, regardless of the method employed in its destruction. As a working hypothesis, which is subject to variation to meet other than routine problems, my own plan is as follows: Growths up to 15 mm. in diameter are excised by V-excision 1 cm. beyond the palpable margin, with the apex of the V 2 to 3 cm. below the vermilion border. Larger growths are treated by radium element in tubes which completely surround the growth on its upper and lateral margins, and extend downward on the skin to form a triangle of varying extent. Growths which have had previous unsuccessful treatment (my own or others) are treated by the Stewart type of operation, taking the whole lip if necessary, along with the glands. Growths at or near the angle of the mouth are excised in triangular or quadrilateral form, using a portion of the upper lip for immediate plastic repair (Figs. 9, 10, 11). There are a few cases which, even though far advanced
locally, show no evidence of metastasis, and appear to offer some chance, if not of cure, at least of palliation. If these cases are conscientiously "cleaned up" by radium, electric cautery, high-frequency current or (and I prefer this method) the old-fashioned soldering iron, it is truly remarkable how much can be accomplished. The case which presents a large fungus-like growth, and is too toxic or debilitated for a general anesthetic, is well adapted for the use of radium emanation implants in gold seeds, first introduced by Failla. The use of radium in these cases has one great drawback. The defect left by the removal of the tumor is usually quite large and requires extensive plastic repair. Radium causes so much damage to neighboring normal tissue that plastic procedures after its use are especially difficult (Figs. 12, 13, 14).

How are the lymphatic structures which drain the lip best removed? By reference to Fig. 2, it can be seen that there are seven regions which may be considered as possible harborers of metastatic cancer cells. These are the lower parotid regions, both submaxillary regions in their entirety (including a gland on the deep surface of the submaxillary salivary glands which lies along the mesial or lingual aspect of the body of the mandible), the submental regions, and the region along the facial vessels just above the lower border of the mandible. I have already called attention to the fact that the lymph vessels course downward very superficially; the superficial fascia, therefore, should be removed with the glands. The depth of the removal is the surface of the sternocleidomastoid, the digastric, the mylohyoid, the hyoglossus, and the geniohyoid muscles.

The technic which I have evolved is, briefly, as follows: After the patient is anesthetized (ether by drop method, no special apparatus employed), the table is tilted upward 45 degrees, and the patient's head is hyperextended. Preparation of the field of operation includes painting both shoulders with tincture of iodine. The following points are scratched on the skin to locate the skin incision: both mastoid processes, finger's breadth below each angle of the jaw and the body of the hyoid bone. The patient is now draped. The operation proper is divided into steps, as follows.

First Step: The skin incision (which is one recommended by Kocher) is carried only through the skin, which is immediately undercut on its upper margin and raised as a flap well above the margin of the lower jaw. This flap is so thin that the hairs of the beard (in men) appear on its under surface and it contains no blood vessels which require clamping. The vessels in the super-
ficial fascia, however, are quite numerous, and after these are clamped by hemostats they are immediately ligated in order to leave a clear field. (Fig. 3.)

Second Step: The patient’s head is turned sharply to the left, the line of the initial skin incision is deepened to the deep cervical fascia, and the anterior border of the right sternocleidomastoid muscle is exposed. Anteriorly, this deepening is carried well beyond the midline. Many large veins are encountered, but these can almost invariably be identified and cut between clamps, so that very little blood is lost. The incision is carried slightly upward along the sternocleidomastoid muscle. Then, by working forward, the facial vein is identified, doubly clamped, and cut, and both ends are ligated. We are now beneath the deep fascia; the posterior belly of the digastric muscle is in view, and the deep fascia can easily be raised from the digastric tendon and its anterior belly and the right mylohyoid muscle. An identifying clamp is placed upon the deep fascia as it splits to form the capsule of the submaxillary gland, and this part of the field of operation is temporarily abandoned. (Fig. 4.)

Third Step: Beginning at the upper and outer limits of the incision over the sternocleidomastoid muscle, the parotid gland will in all probability have already been encountered. The

---

**Figure 3**

**Figure 4**

**Figure 3. First Step in Operation for Removal of Possible Metastasis to the Lymphatic System of the Neck: Skin Incision Carried Only through the Thickness of the Skin**

**Figure 4. Second Step: Deepening of the Line of Incision through the Platysma Myoides Muscle and Superficial Fascia to the Deep Fascia**
incision is carried upward as far as the reflected skin flap will allow and then swung forward toward the angle of the jaw. It is not hard to identify the facial artery and vein approximately one-half inch anterior to the angle of the jaw. After these are clamped and cut and the upper ends are ligated, the remainder of this step is rapidly completed by raising the fascia from the lower portion of the masseter muscle and freely exposing the periosteum of the mandible from the angle to beyond the midline. (If the Stewart operation is to be performed, this incision is carried only as far forward as the vertical skin incision. See below.) (Fig. 5.)

We have now circumscribed on three sides all the tissues to be removed from the right side of the neck. There remain their deep attachments, chief of which is the facial artery.

**Fourth Step:** The preceding step has so loosened the tissues that, by grasping the identifying forceps previously placed in the cut edge of the deep fascia, the submaxillary salivary gland can be elevated and pulled forward. A few passes of the handle of the knife made between the posterior belly of the digastric muscle
and the submaxillary gland will readily expose the facial artery. This vessel is clamped as close to its entrance into the submaxillary gland as possible and cut, and its proximal end is doubly ligated. Now there is nothing but loose areolar tissue, small arteries and veins, and Wharton’s duct attaching the mass of tissue to the muscles. The dissection of the right side is completed from the parotid tissue toward the midline, but no attempt is made to clean the submental triangle at this stage, although the right half of the mylohyoid muscle is exposed. (Fig. 6.)

Fifth Step: After making sure that there is no bleeding from the wound on the right side of the neck, the operative team changes sides and, with the patient’s head now sharply turned to the right, the dissection of the left side is carried out in similar manner to the right. The final step in the removal of tissue is the cleaning of the submental triangle. This is carried out after the tissues are raised toward the midline. With an assistant spreading the two sides out, wing fashion, and at the same time pulling upward, it is a simple matter to clean the space between the anterior bellies of the digastric muscles. The last attachments of the ablated tissue are at the symphysis. (Fig. 7.)
If the Stewart operation is to be performed, a towel wrung out of cyanide of mercury solution is placed over the exposed muscles, the glands and areolar tissue are laid upon this, and all drapes are removed from the patient's face. The anesthetic is stopped and the field of operation on face, lip, and chin prepared. Incisions which have previously been indicated by scratch marks are now carried downward and slightly outward at a safe distance from the margins of the growth on the lip until they meet the neck incision. The full thickness of the lip and all the tissues of the chin, to the periosteum, are included within the vertical incisions and, as the tissues are raised from the periosteum of the chin, the whole block of tissue which contains the primary lesion, a wide margin of lip, skin and mucous membrane of the lip, skin and subcutaneous tissue of the chin, with all the draining lymph channels and glands, comes away in one intact mass. As stated before, this is one of the few ideal operations for the operative removal of cancer. The repair of the resultant defect in the lip and chin, though tedious, is not especially difficult and can ordinarily be completed before the patient recovers from the anesthetic. The cosmetic and functional results are fairly satisfactory. (Fig. 8.)

Following the neck dissection, the wound is rather loosely closed with interrupted sutures. Iodoform-gauze packs are placed in the large spaces left by removal of the submaxillary salivary glands, and rubber-dam drains are sewed into the lateral angles

Fig. 8. Cosmetic Result after Stewart Operation
RATIONAL THERAPY FOR CANCER OF THE LOWER LIP 1333

of the wound to carry off saliva from the cut surface of the parotid glands. These should be left in place until there is no more drainage—usually seven to ten days.

I have described the above operation in detail because I believe that such a removal of tissue, if carried out in every case of squamous-cell cancer of the lower lip, will be followed by a much larger percentage of "cures" than is ordinarily obtained. It is attended by very little operative risk. The shock entailed is not as great as that which follows the radical amputation of the breast. The chief risks are damage to the hypoglossal nerve as it courses across the submaxillary space on the surface of the hyoglossus muscle, damage to the lingual branch of the fifth nerve which lies high in the submaxillary triangle, and infection of the wound, with possible secondary hemorrhage from the facial artery. The operation might be objected to on the ground that the cervical branch of the seventh nerve, which supplies the depressor anguli oris muscle, must necessarily be severed. When one angle of the mouth droops, due to the paralysis of this muscle, the deformity is quite noticeable; but when both sides are equally affected, the deformity and lack of function of the muscles are negligible.

If microscopic examination of the lymph nodes fails to show the presence of carcinoma, and the primary lesion of the lip has been effectively dealt with, the patient has from 90 to 100 per cent chance of being cured of carcinoma. Sistrunk (14) shows 90 per cent and Bloodgood (2) claims 100 per cent cures in cases in which

Figs. 9 and 10. Tumor in Left Angle of Mouth, Removed under Local Anesthetic

Scar lines show the size of the flap from upper lip and cheek swung to replace the defect left by wide removal of tissue containing the carcinoma.
the primary lesion could be excised by V-excision without a plastic repair of the lip. Our cases at Barnard Free Skin and Cancer Hospital, regardless of the size of the primary lesion, show 88 per cent cures of five years or longer, where excised lymph nodes fail to show metastases.

When metastases are already present, the prognosis is entirely different. Statistics showing the percentage of operative cures in such cases will be very misleading, for surgeons will necessarily differ in their opinions as to what constitutes an "operable" case. A number of our cases which were still considered operable had metastases adherent to the periosteum or had already invaded the skin in the submaxillary or submental regions. I do not regard such cases as necessarily hopeless, but believe that they require more extensive surgery. In fact, if metastases exist, either macroscopic or microscopic, in the submental, submaxillary, or parotid lymph nodes, the next more centrally located lymph-bearing tissue must be removed. My plan is as follows.

If the metastasis is located definitely to one side of the midline, a block dissection from the clavicle to the mastoid process is performed. The removed tissue includes the deep fascia from the midline to the anterior border of the trapezius muscle and from the clavicle to the skull; the entire sternocleidomastoid muscle, the deep jugular vein with the most important chain of lymphatic glands which nearly surround it, the suprACLAVICULAR areolar and gland tissue, and the glands which lie between the jugular vein
and the posterior belly of the digastric muscle. If the submental group of glands is involved, this procedure is carried out on both sides of the neck, including removal of both internal jugular veins, the operations being performed at an interval of several weeks.

Figs. 12 and 13. Apparently a Hopeless Case of Fungating Squamous-cell Carcinoma (Grade III) Treated with Radium Emanations in "Seeds"
The post-radiation result is shown in the picture to the right.

Fig. 14. After-repair in Case Shown in Figs. 12 and 13, to Make Mouth Water-tight
Appearance five years after treatment.

Since these massive block dissections to remove lymphatic tissue from the deeper planes of the neck are common to the treatment of cervical metastases from primary foci located in many different regions, the details of the operative technic will be omitted from this article. Suffice it to state that complete surgical removal of
the ordinary channels for the passage of lymph from the lip to the mediastinum is a technical possibility with a very low operative mortality. True, the resultant deformity is considerable and, in some cases, the paralysis of the trapezius muscle is a handicap. But these are not major considerations when the alternative is uncured carcinoma.

Since Broders (4) first contributed his classical study of the histologic picture of squamous-cell carcinoma of the lower lip in reference to the clinical course of the disease, no discussion of the subject is complete unless it contains some reference to "grading." We have adopted Broders' classification not only for carcinoma of the lip, but for all malignant tumors. Burrows graded sixty cases and found the percentage of cases in each grade closely approximating those in Broders' series. Recently L. H. Jorstad, now in charge of the pathological laboratory of the Barnard Free Skin and Cancer Hospital, regraded all the lip cases in which the material is available. We had hoped that grading would simplify the cancer problem as a whole and cancer of the lip in particular. It has disappointed us in two ways: Cases which were Grade I, and apparently did not need neck dissection, showed up with metastases. Also, we have been able to show at least two different "grades" in the same tumor. It follows, therefore, that metastases may be of a different grade than the primary lesion.

These difficulties have been encountered by others (17). I cannot quite agree with MacCarty (10), who says: "A very good piece of scientific observation has been spoiled by the clinicians." I believe that Broders' work has stimulated widespread interest in tumor morphology, both among surgeons and pathologists, and has given us a readily understood and brief terminology for "highly differentiated" tumor cells (Grade I), tumor cells "more (Grade II) or less (Grade III) differentiated," and "undifferentiated" tumor cells (Grade IV). I do not believe that as yet the histologic form of either the primary tumor or the metastases should influence the plan of surgical treatment. Broders' classification has not changed prognosis. This has been the same since Virchow's time, namely, the more highly differentiated the tumor cells, the better the prognosis; the less differentiated, the worse the prognosis. But no matter what the histologic grade may be, I believe that every patient who has a surgically removable carcinoma of the lower lip should be given the benefit of most thorough local destruction of
the tumor, followed by an equally thorough neck dissection. The relative malignancy of the tumor is beyond our control, but the adequacy of the surgery, upon which the final result will depend in approximately 75 per cent of all cases, is entirely the responsibility of the surgeon.

Bibliography