SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY

February 2nd, 1945

President—C. GILL-CAREY, F.R.C.S.Ed.

Discussion on Treatment of Carcinoma of the Larynx

E. D. D. DAVIS: *A review of 40 cases of laryngofissure for early intrinsic carcinoma of the larynx.*—This review has been undertaken to ascertain: (1) the features of those cases which are suitable for a successful laryngofissure; (2) the value of some modifications and details of the technique of the operation; (3) the results of the operation particularly in comparison with radium implantation, radiotherapy and complete laryngectomy.

It is recognized that the earlier the diagnosis the better and more lasting is the result of excision by laryngofissure.

The cases in which the growth is hard, keratinized and more or less limited to the middle or anterior third of the vocal cord are most suitable for excision by laryngofissure. The commonest site for an intrinsic epithelioma of the larynx is the vocal cord and the growth tends to extend horizontally to the anterior or posterior commissure. It may burrow under the surface of the cord. A few cases commence in the subglottic area usually near the anterior commissure and then involve the vocal cord. A slight extension upwards on to the ventricular band or into the ventricle does not make it unsuitable for successful excision. If the growth has extended to the subglottic area, the posterior commissure or across the anterior commissure with fixation of the cord it cannot be completely excised by laryngofissure. It must be remembered that the upper surface of the growth only is seen by the laryngoscopic mirror but any extension to the subglottic area though hidden can be suspected if there is any stridor, obstruction or fixation of the cord. It happens on a very few occasions that during the operation when the growth is thoroughly exposed it is found that the growth is more extensive than expected.

Gordon New of the Mayo Clinic has stated that cases which have had a laryngofissure are not such good cases for a subsequent complete laryngectomy but there is no objection to an exploratory operation by laryngofissure if there is considerable doubt as to its suitability. Direct laryngoscopy should be used in doubtful cases.

The large majority of epitheliomata can be diagnosed accurately without a biopsy. A biopsy of value demands that an adequate piece of the growth has been removed from the right place and presents a definite histological picture.

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

Even then it is necessary to exclude tuberculosis and syphilis. It is in cases of obscure tuberculosis when the sputum is absent and when physical signs cannot be detected that a biopsy is necessary. The Mayo Clinic surgeons place considerable reliance on Broders' classification of malignancy by the histology of the section. Class 1 is comparatively benign and does not metastasize. Class 4 is very malignant. New records that all Class 4 cases found in 44 patients, in which the growth recurred after laryngectomy, died. 72 per cent. of StClair Thomson's Grade 4 cases recurred. Colledge and I have noticed that the surface of the section may be Class 1 but another and deeper part of the section may be Class 3 or 4. It is difficult even for the expert to be reasonably sure of his classification. Moreover a larger piece than can be obtained for biopsy is essential for an accurate classification. Most of my cases free from recurrence have been of the epidermal type with cell nests and probably Grade 1.

The anæsthesia I prefer is chloroform and ether administered by a soft small intratracheal tube. At the Mayo Clinic local anæsthesia is preferred. Five drops of a solution of cocaine injected with a hypodermic syringe through the cricothyroid membrane before splitting the thyroid cartilage results in a tranquil operation.

The isthmus of the thyroid gland was divided in all the cases so as to expose the trachea and to facilitate a tracheotomy should it be necessary. Tracheotomy has been avoided in the last 6 of the 40 cases and I now find that tracheotomy is undesirable and unnecessary. The intratracheal tube is completely reliable. As soon as the larynx has been opened the trachea is sealed by packing ribbon gauze around the intratracheal tube. This tube does not obscure the area of operation. It lies snugly on the posterior commissure and is not in any way cumbersome.

In the remaining 34 cases the tracheotomy tube was removed before the patient left the operating table and it was never necessary to replace it.

It is essential to see that the wound is absolutely dry before the larynx is closed. Oozing is arrested by a small button electrode with the weakest possible diathermy (shortest spark gap) or by the usual method of touching the artery forceps with a diathermy electrode. Those cases in which the growth was excised by the diathermy needle appeared to me to be more septic later and took longer to heal so I have given up excision by diathermy and use the knife or scissors. New seals the laryngeal wound lightly with a small button electrode with the weakest diathermy current to be effective. Some surgeons found it necessary to use a stitch ligature for the small arytenoid artery. Hajek and J. S. Fraser packed the larynx with gauze to prevent hæmorrhage. The packing was removed the next day. This method is not recommended.

Division of the body of the hyoid bone adopted by New to allow the larynx to be drawn up into the wound and to facilitate access is unnecessary in my experience. Division of the hyoid bone causes pain and discomfort with the movement of the tongue on swallowing.

The saw, a rough surgical instrument, was not used at any time to divide the thyroid cartilage. There was never any difficulty in dividing the cartilage with the knife and Irwin Moore's shears.

I prefer to denude the thyroid alæ by dissecting off the soft tissues and growth *en bloc* and not to remove the alæ. The thyroid cartilage is a barrier

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

to the spread of the growth. There has been no disadvantage when the thyroid alæ have been removed.

At the end of the operation the thyroid alæ are accurately replaced and the larynx closed by fine catgut stitches through the thyrohyoid and the cricothyroid membranes.

There were no deaths as the result of the operation in the 40 cases. The mortality in 41 operations performed by Gordon New was nil. It is interesting to note that in 1888 before the days of asepsis and antisepsis Morell Mackenzie reported 22 cases, 6 of whom died and 72 per cent. recurred.

Deep X-ray with teleradium (radium bomb) in my experience has been unsatisfactory. Burning of the skin and necrosis of the cartilage and even the rings of the trachea have caused misery to the patient. Two cases of early intrinsic carcinoma of the vocal cord treated by teleradium with recurrence after two years were treated by laryngofissure and were still without recurrence after five years.

Radium implantation gives the most beneficial dose at the right spot more accurately than any other method of radiotherapy but my experience of this technique is too small to be of any value.

Laryngofissure.—Gordon New : 41 cases, 13% recurrence. StClair Thomson : 60 cases, 25% recurrence. Davis : 9 *no* recurrence after five years and longer ; 5 recurred *after* two years ; 4 recent operations within two years ; 7 exploratory and unsuitable ; 15 cannot be traced.

Laryngectomy.—Mayo Clinic : 86 cases, 52% recurrence ; 8% immediate mortality.

Radium implantation.—Harmer (*personal communication*) : 24 early cases, 14 survived three years, 42% recurrence ; 72 advanced cases, 32 survived, 54% recurrence.

LIONEL COLLEDGE : Mr. Davis seems to think that I always excise the larynx. But there is no real contrast between laryngofissure and total excision of the larynx. The proper operation must be selected for each case. The operations to be employed are : laryngofissure, a partial excision which rather goes beyond the limits of strict laryngofissure, and total laryngectomy. I have already described the technique, most recently in the Lettsomian Lectures delivered before the Medical Society of London, and I do not think I need detain this meeting with detail, because I look upon the operations as more or less standardized.

There are some points in the remarks by Mr. Davis which call for comment. Whilst it is true, as he says, that in the majority of cases a correct diagnosis can be made without biopsy, it is equally certain that in this situation mistakes will be made in cases which appear to be epitheliomatous unless biopsy is done as a routine. He says that it is in obscure cases of tuberculosis that biopsy is needed, but it is just these cases that are missed unless routine biopsy is done, because this form of senile tuberculosis in the middle-aged or elderly mimics epithelioma very closely. The majority of mistaken diagnoses are due to confusion clinically between tuberculosis and epithelioma, much less often to syphilis but also to hæmatoma, innocent tumours and leukoplakia. The latter in my view is often precancerous and justifies laryngofissure. Biopsy is not only useful in providing a confirmation of the diagnosis, but Broders' grading

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

gives an indication of the degree of malignancy and therefore of prognosis from the surgical point of view, though at present it gives no information concerning radio-sensitivity. Any case of epithelioma in Group IV requires a very radical operation and is unsuitable for laryngofissure. Either total excision or radiotherapy by beam is the appropriate treatment. On the other hand there should be no exploratory laryngofissures, to which Mr. Davis says there is no objection. A sufficient clinical study of the case will provide the information upon which the appropriate operation can be chosen. Laryngofissure upon an unsuitable case is not necessarily a disaster, but may easily become one if the incision cuts into the tumour. In any case the best technique for the more radical operation is made impossible, and to convert the lesser procedure into the major one involves various technical difficulties.

The true tumours of the larynx, that is the intrinsic tumours which mostly arise on the vocal cords, with a few subglottic, in the ventricles or on the false cords, no longer offer any surgical problem, because appropriate operations are available for all situations and all stages short of gross extension beyond the confines of the larynx. These operations of laryngofissure, partial excision and total excision of the larynx may now be said to be standardized : the indications for each and the technique have been fully described (Lettsomian Lectures, Medical Society of London, 1943, in the press), and they provide a good percentage of lasting results. Among earlier cases out of 23 cases of laryngofissure or partial laryngectomy 18 survived more than ten years, and out of 75 cases of laryngectomy 45 survived more than ten years. As the technique is now better than it was ten to twenty years ago, and these figures include the operative mortality, the outlook now should be better than this, which gives 63 per cent. freedom from recurrence for ten years, 78 per cent. for early cases, and 60 per cent. for later cases. This percentage is so high that any form of treatment designed to replace excision must show a good record of successful results, if alternative treatment can be justified. The problem at the moment is whether radiotherapy can safely be substituted as routine treatment for these forms of cancer in place of the operations mentioned. To make the comparison Dr. Lederman will say what can be expected from radiotherapy. There are, however, a few points which need attention, because they reflect on the advantages claimed for radiotherapy. It is often suggested that as radiotherapy is a non-mutilating form of treatment it should have the first chance, because if it fails operation can follow and may still succeed. There is some truth in this and I have many patients in whom operation has succeeded after failure by deep X-rays or radium, or even both, but unfortunately it is not the whole truth. Sometimes the tissue changes after irradiation are not severe, the operative technique is not much hampered and healing is not prolonged for more than a week or ten days beyond the usual period. In consequence an experience founded on a few cases can be very misleading and cause the adoption of a too optimistic view of this situation.

In only too many cases the changes in the neck cause dissections to be extremely difficult, especially gland dissections, healing is almost indefinitely prolonged, pharyngostomes form and plastic operations on the devitalized skin of the neck fail constantly. It may be necessary to bring skin from a distance by tube pedicle grafts and relatively simple plastic operations become long,

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

tedious and uncertain, and at the worst sloughing and hæmorrhage in the absence of the normal process of repair may destroy the patient. I do not think, therefore, that the statement that operation can follow irradiation is a valid argument for irradiation stated in that too simple form.

A further difficulty arises from the fact that the most attractive target for the radiotherapist is an early epithelioma of the cord, suitable for excision by laryngofissure. If the radiotherapist fails to cure, however, a total laryngectomy is required. I have now such a case in a robust middle-aged man who was treated by radium and then by deep X-rays. He remains well with a good pharyngeal voice after laryngectomy ; but he has lost his larynx when he might have been cured by laryngofissure. On the other hand, a spare, elderly man came to me with an early epithelioma of one cord, very suitable technically for laryngofissure, but he has a high blood-pressure and has lost the sight of one eye from a detachment of the retina. These may not be absolute contra-indications to operation, but I regard them as relative contra-indications when the alternative of radiotherapy is available. Dr. Lederman restored the larynx of this patient to a normal appearance, and so far it has remained so, but only a year has elapsed. In another case a well-preserved man over 80 has had a normal larynx for more than a year since an epithelioma of the anterior commissure disappeared under the influence of teleradium. I particularly mention these early cases which provide a brilliant success to the radiotherapist, because the more the growth has advanced the more difficult becomes his task and the greater the percentage of failures. Consequently radiotherapy is not complementary to excision, but is only an alternative method. In other words, radiotherapy is a much more efficient substitute for laryngofissure than it is for laryngectomy, which is naturally the more mutilating operation. I feel, therefore, that whilst selected cases should be treated by radiotherapy, it is not right to treat all cases as a routine by radiotherapy and operate afterwards on the failures. Biopsy does not help to distinguish the tumours which are likely to prove failures from those that are radio-sensitive, and the therapeutic test which has been proposed by Nielsen and Strandberg, 1942, *Acta radiol. Stockh.*, xxiii, 189, and Cutler, Max, 1944, *Arch. Otolaryng., Chicago*, xxxix, 53, seems to me to indicate a half-hearted, undecided attitude. It is still necessary to consider each case as a whole and then decide whether to recommend excision or radiotherapy for that individual.

Finally, the time has passed for burying needles in the neck. If radiotherapy is employed it should always be by means of the teleradium beam, which can now be adjusted to such accurate dosage that the risk of radionecrosis is very small, provided the patient is protected from minor injuries locally.

M. LEDERMAN : *Treatment by radiation of the so-called intrinsic cancers of the larynx*, that is, primary squamous cancer arising from : (1) The ventricle, the false cord, and the base of the epiglottis ; (2) the true cord ; (3) the subglottic region. Extrinsic cancers have been excluded because they are pharyngeal in origin and require an entirely different radiotherapeutic approach.

Two main radiotherapeutic methods are available for treating intrinsic cancer : (1) The use of radium either alone or in combination with surgery, e.g. teleradium or the Finzi-Harmer operation. (2) The use of X-ray therapy

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

either alone or in association with surgery, e.g. high voltage therapy or the Lambert-Watson operation, which is roughly the X-ray counterpart of the Finzi-Harmer operation.

A combination of high voltage X-ray therapy and teleradium finds favour at some centres. The intralaryngeal use of radium either by intubation or implantation of radon seeds and the use of surface radium moulds are to be condemned.

The Finzi-Harmer and the Lambert-Watson procedures find their greatest field of usefulness in the treatment of early lesions of the vocal cord, i.e. the type of case for which the laryngofissure operation is available. High voltage therapy or teleradium can be used for similar cases as well as the more advanced cases which surgically would demand partial or total laryngectomy.

Whilst the Lambert-Watson procedure is too recent for its value to be assessed, the Finzi-Harmer operation represents a definite landmark in the history of radiation treatment of endolaryngeal cancer, and its value has been established beyond all reasonable doubt. Nevertheless, I believe that external radiation by teleradium or high voltage X-ray therapy can and probably will supplant this method, for the following reasons: (1) The results obtained by external radiation for comparable cases are as good without any operative risk; (2) on physical grounds external methods are more efficient and safer; (3) individualization of treatment is the keystone of success when dealing with a group of tumours of variable and unpredictable radio-sensitivity. The necessary degree of individualization is only possible with external radiation, where the treatment can be clinically adapted to a particular patient's requirements, in contrast to the Finzi-Harmer method where the patient has to be submitted to a fairly rigid technique.

Fundamentally the only difference between gamma rays and X-rays is one of wavelength, and whether the short wavelength γ-rays differ from the longer wavelength X-rays in their biological effect on malignant tissues is still not definitely known. Upon purely clinical grounds I am convinced that normal tissues, dose for dose, show less change with teleradium than with X-ray therapy under ordinary conditions of treatment. This may, however, be due to the different dosage-rates employed rather than to any difference in wavelength. Certain differences of apparatus and physical conditions of treatment endow teleradium therapy with greater technical precision and flexibility and permit greater individualization of treatment than is the case with X-ray therapy.

For the individual case of intrinsic carcinoma of the larynx the selection of treatment method as between surgery and radiotherapy is difficult. Whilst it is obvious that there is need for both methods if all patients are to receive the best treatment, there is a diversity of opinion concerning the precise indications for each method. Any attempt made to solve this problem must take into account the following considerations:

General condition of the patient.—Age and general condition do not limit radiotherapy to the same extent as surgery. The modern treatment of laryngeal cancer is one of the mildest of all curative radiotherapeutic procedures. Correctly administered treatment should not give rise to any general constitutional upset, and local symptoms need rarely exceed increased huskiness accompanied by slight soreness or dryness of the throat. Severe dysphagia

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

or marked skin reactions should not occur, and in most cases œdema of the larynx is avoidable.

Purpose of treatment.—If on any grounds, either general or local, curative treatment is out of the question it is evident that radiotherapy can offer more than surgery. The only palliative procedure available to the surgeon is tracheotomy, whereas the radiotherapist can often relieve distressing symptoms and prolong the life of the patient in reasonable comfort. Frequently the assistance of both is required.

Histology of the tumour.—It is not uncommon to find, particularly in American literature, considerable importance attached to the histological grading of squamous cancer. This method of grading is of some value in assessing the degree of malignancy and also the method of treatment in so far as the more anaplastic types, i.e. Grades III and IV, are usually biologically inoperable even when technically operable. Grading may also assist in prognosis, but it provides little guide to radio-sensitivity, since anaplastic carcinomata are not necessarily, as is often assumed, more radio-sensitive than differentiated carcinomata.

Extent and site of the disease.—The extent of the disease is clearly of paramount importance in selecting treatment. The degree of laryngeal extension and the presence of extralaryngeal spread or metastases will frequently decide whether surgery or radiotherapy is to be employed, and, in the case of the latter method, whether treatment is to be purely palliative or not.

Site is equally of importance since supraglottic neoplasms, arising from the ventricle, the false cord or the base of the epiglottis, tend to be most, and the subglottic neoplasms least, radio-sensitive, with tumours of the true cord showing an intermediate and moderate degree of radio-sensitivity. Hautant recommends radiotherapy for most of the supraglottic, and laryngectomy for some of the ventricular and all the subglottic neoplasms. Although experience proves that the supraglottic tumours are a satisfactory group to treat by radiotherapy, opinions as to the suitability of the subglottic group for radiotherapeutic treatment should be accepted with reserve until radiotherapists are given greater opportunities of treating them. It is the common tumour of the true cord which presents the greatest problem. I believe that cancer of the true cord should always be treated by radiotherapy, with the exception of the more advanced and some of the recurrent cases. A certain number of advanced cases showing fixation of the cord can be cured by radiotherapy, but the presence of infiltrated cartilage reduces the prospects of cure, whilst a complicating septic perichondritis is an absolute contra-indication to radiation.

Where doubt exists as to the best method of treatment trial radiation is justifiable. By this means it is possible to determine approximately whether a particular tumour will or will not respond before a full course of treatment is given, and if necessary surgery can be undertaken before marked radiation changes occur in the tissues. Features suggesting that radiotherapeutic treatment should be abandoned or given for palliative purposes only are: (*a*) Poor response of the primary lesion, or no improvement of symptoms such as dyspnœa and stridor at the end of half the course of treatment—roughly three weeks. (*b*) A laryngeal œdema which fails to subside during treatment, or an œdema arising early in treatment and persisting. (*c*) Local septic

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

complications as shown by : (i) Persistent pyrexia in the absence of an extra-laryngeal focus of infection ; (ii) the onset during treatment, or persistence, of fœtor ; (iii) perilaryngeal abscess. (*d*) Any deterioration of the patient's general condition, particularly loss of weight in the absence of dysphagia.

It is difficult to lay down any hard and fast rules for the treatment of recurrent cases. For local and scar recurrences after excisional surgery radiotherapy is useful as a palliative agent and sometimes effects a cure. We have had more success with post-laryngectomy recurrences than with those following laryngofissure : radical surgery should be considered for the latter if the aim is cure rather than palliation.

For local recurrences after radiotherapy it can be stated quite categorically that further radiotherapy has many dangers and only infrequently results in cure : wherever possible these cases should be treated surgically ; failing this radiotherapy can be undertaken as a palliative treatment.

The best way of dealing with cervical lymph-node metastases is as yet undecided. In a previously untreated neck I recommend teleradium as the primary method of attack in both operable and inoperable cases, surgery being retained as a second string. If metastases occur in a previously treated neck, surgery should, if possible, be the first choice and radiotherapy reserved for cases unsuitable for this method. Any claim made for the wide use of radiotherapy in the treatment of operable intrinsic laryngeal cancer, to be acceptable, must be based upon the results obtained. It is therefore of the utmost importance that the following facts be given due consideration when attempting to assess and compare radiotherapeutic results with those of surgery :

(1) Surgical skill and technique in the performance of the various laryngeal operations for cancer have reached their peak of efficiency and it is unlikely that any further developments of technique will produce much improvement in results. By comparison radiotherapeutic treatment is still in process of development and has, in fact, only recently emerged from that dismal stage wherein laryngeal surgery found itself fifty years ago.

(2) Figures emanating from surgical sources are selected figures since only cases operated on are recorded. To obtain an accurate picture of the true value of the method as much attention should be given to the number of cases found unsuitable for surgery as to the cases successfully treated.

(3) The radiotherapist has to be content to base his results largely on material discarded by the surgeon. A true comparison of results will only be possible when the radiotherapist's material is comparable.

(4) There is no statistical method of showing the two great advantages of radiotherapy over surgery, namely, conservation of the larynx and the absence of an operative mortality.

The results of surgery are on the whole very good and are a credit to surgical skill and achievement. In Mr. Colledge's series, for example, 70 per cent. and 60 per cent. ten years' survival rates set the radiotherapist a very high standard for emulation but the operative mortality and recurrence rate for most published series are not negligible.

I believe that Tables I, II and III provide enough evidence to show that for the early cases, i.e. those suitable for laryngofissure or hemilaryngectomy, radiotherapy can offer the patient as much as surgery with less risk. Similarly

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

for the more advanced cases where laryngectomy is the operation of choice radiotherapy can successfully compete with surgery in an appreciable proportion of the cases, but there will always be a certain number of patients who will have to sacrifice the larynx to save life. For the inoperable cases radiotherapy is of palliative value and shows on the whole a worth-while salvage rate.

The figures also show that radiotherapy results are durable. My own experience leads me to believe that the case that does well initially remains well, i.e. the recurrence rate is not high, certainly less than that following surgery.

The radiotherapist is dependent on his surgical colleagues for material and unless he is adequately supplied with suitable cases radiotherapeutic progress is bound to be painfully slow. The problem of the " relative spheres of interest " of radiotherapy and surgery could be settled within the next decade were the radiotherapist enabled to explore fully all the promising potentialities that radiotherapy possesses.

Slides were shown illustrating radiation reactions, results of radiation treatment and types of case both suitable and unsuitable for radiotherapy.

TABLE I.—RESULTS OF RADIOTHERAPEUTIC TREATMENT

Author	No. of cases	Material	Survival rate	Period of observation
Coutard (1921-32)	143	Precise details not stated. Mostly inoperable and post-operative recurrences	39 = 27%	5 years
Schintz and Zuppinger (1929-35) ..	33	Operable and inoperable	4/14 = 28%	5 years
Nielsen and Strandberg (1931-40) ..	63	Operable 20 Inoperable 43	6/10 = 65% 8/32 = 25%	3 years
Cutler (1938-43)	84	All cases Cord tumours : Mobile } 28 Partly fixed } Fixed 12 40	31/84 = 37% 23/28 = 82% 0/12 = 0% 23/40 = 57%	3 years
Blady and Chamberlain (1931-37) ..	23	No precise details but of 11 patients with cord fixation 5 survived 5 years	13/23 = 67%	5 years

TABLE II.—CASES TREATED AT THE ROYAL CANCER HOSPITAL (1933-1944 INCLUSIVE)

Total cases	Material		Survivals	Dead: Disease present	Dead: Untraced	Dead: Intercurrent disease
56			18	3	1	1
All cases seen were treated Teleradium used exclusively	Operable	23	8 : 5 years or more			
	Inoperable	19	1 : 5 years	15	3	—
	Recurrent	14	5 1 : 5 years or more	8	—	1

TABLE III.—ROYAL CANCER HOSPITAL OPERABLE CASES TREATED BY TELERADIUM THERAPY

Operation	No. of cases	Result
Suitable for : Laryngofissure Partial laryngectomy	4 4 } 8 (5 patients between 72-79 years of age)	All patients initially symptom-free 6 living and symptom-free : 2 for 5 years or more 1 for 2-3 years 3 for 1-2 years 1 patient died of intercurrent disease 1 patient untraced
Suitable for laryngectomy	15	12 living and symptom-free ; 6 for 5 years or more

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

BIBLIOGRAPHY

BLADY, J. V., and CHAMBERLAIN, W. E. (1944) *Amer. J. Roent.*, li, 481.
COLLEDGE, L. (1943) Lettsomian Lectures (in the press), London.
COUTARD, H., quoted Cutler Bushke (1938) Cancer Diagnosis and Treatment, Philadelphia, 568.
CUTLER, M. (1944) *Arch. Oto. Laryng.*, Chicago, xxxix, 53.
CUTLER, M. (1944) *J. Amer. med. Ass.*, cxxiv, 967.
FINZI, N. S., and HARMER, W. D. (1928) *Brit. med. J.* (ii), 886.
HAUTANT, A. (1936) *Z. Hals-Nas.-u. Ohrenheilk.*, xl, 15.
LAMBERT, V., and WATSON, T. A. (1942) *J. Laryn.*, lvii, 222.
LEDERMAN, M. (1943) *Brit. J. Radiol.*, xvi, 298.
LEDERMAN, M., and MAYNEORD, W. V. (1943) *Brit. J. Radiol.*, xvi, 301.
NIELSEN, J., and STRANDBERG, O. (1942) *Acta Radiol. Stockh.*, xxiii, 189, 255.
SCHINTZ, H. R., and ZUPPINGER, A. (1937) Siebzehn Jahre Strahlentherapie der Krebse, Leipzig.

Lieutenant-Colonel W. L. HARNETT (Medical Secretary to the Clinical Cancer Research Committee of the British Empire Cancer Campaign) brought forward some as yet unpublished figures concerning 123 cases of cancer of the intrinsic larynx. There were 113 males and 10 females, a sex ratio which was in accord with general experience. The mean age in both sexes was 62. On a clinical classification there were 57 early cases, in which the disease was confined to the larynx, 63 advanced cases in which it had spread to the surrounding tissues, with or without metastases in regional lymph nodes, and 3 cases in which there were distant metastases. Of the 57 early cases, 15 were treated by radical surgery, of whom 13 were alive after four years, 19 by radium of whom 8 were alive, 13 by X-rays of whom 4 were alive and 10 by palliative methods, all of whom were dead. The operation mortality for laryngofissure (12 cases) was 8·3 per cent., for laryngectomy (3 cases) nil. Of the 66 patients in the later stages all except 5 were dead.

E. MUSGRAVE WOODMAN said that he did not agree with Mr. Colledge that to bury needles in the neck was an anachronism. He followed Mr. Douglas Harmer in using needles with the window method for the treatment of carcinoma of the vocal cord. It was unfortunate that Mr. Harmer had not been able to be present because that particular method of application had not been presented. Carcinoma of the vocal cord itself could be cured by operation or by radiotherapy. Excellent results were obtainable with laryngofissure, and Mr. Harmer had obtained excellent results with radium therapy. The speaker had hitherto followed the method of inserting radium needles through the window in the larynx, and if necessary following it up with X-radiation through the port thus made. The results had entirely satisfied him.

Even if the result with radiotherapy was constantly no better than that with surgery they must, in fairness to their patients, use radiotherapy because it restored the larynx to the condition in which it was before; in other words, the patient had a good voice, whereas with the best of operations there was a defective voice. He had been rather disturbed by the inefficient result of radium on growths in the sac of the larynx and at the base of the false cords. In his experience not one such case had done well with radium or teleradium, but such cases should be sharply separated from primary growths of the cord, and should

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

be first subjected to surgery as the method of choice followed later, if necessary, by radiotherapy.

Mr. Colledge had been a pioneer in laryngectomy, and his results were excellent. But it was rather difficult to persuade a patient to give up his larynx and to be told that he would never speak again. If any method could be found which would remove that unpleasant necessity they would all be pleased.

He had been interested in one of Mr. Davis's cases which had died of carcinoma of the œsophagus. One of his own best cases had an extensive growth in the larynx and pharynx. He had had to take out the larynx and pharynx, but the patient lived for ten years and then developed cancer of the œsophagus and died therefrom.

N. S. FINZI said that when they saw a patient with an intrinsic growth of the larynx the best thing they could do was to put themselves in his position, and, knowing all they did about the various treatments, imagine what they would desire in their own case. As to growths which were suitable for laryngofissure, they had to consider the patient's life first rather than his voice. There was no question about the effect on the voice; Mr. Harmer had had gramophone records of voices made, and the comparison between even the best "laryngofissure voice" and the average "radium voice" was very striking. Some of Mr. Harmer's cases had survived for over twenty years.

From what Mr. Lederman had said it looked as if teleradium was going to give better results that radium implantation. If subsequent operation were necessary, however, the cases in which implantation had been used would not give anything like the difficulty which might be expected in cases receiving external radiation. On the other hand, if anything like as good results could be obtained with external radiation, this should be given.

Treatment by radium in former times did not afford such good results as were obtainable when individual treatment was developed later. He thought there was likely to be further improvement in results now that sepsis could be so largely eliminated. Though operations were sometimes necessary for the failed cases of radium and X-ray treatment, there were also, of course, the failures of surgery with which radiotherapists had to deal.

The speaker suggested that Mr. Davis might have got better results if he had had these cases heavily irradiated after laryngofissure in order to prevent that small percentage of recurrences in those cases where he had failed to remove the growth completely. Mr. Lederman had shown some cases where there was an unexpectedly large spread of the growth beyond that visible with the laryngoscope and he had himself seen some of these cases. Perhaps it might help to eliminate some of the errors if a skiagram of the soft tissues were taken before treatment was started.

V. E. NEGUS said that about five years ago the late Sir StClair Thomson and himself started to write another edition of the textbook, and now, after Sir StClair's death, he was left to carry on that struggle alone. It was very difficult in editing such a book to form conclusions as to the right treatment of certain diseases of the nose and throat. He had found this particularly when endeavouring to decide what was best for a patient who had carcinoma of the larynx. If they could get patients cured by radiotherapy, with a normal voice afterwards, instead of by operation, with a somewhat hoarse voice, they

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

should certainly do so ; but he had had a certain number of patients with a type of growth which might be expected to respond to radiotherapy who came back with recriminations because they had been subjected to that procedure. He warned patients that they must not expect that they were going to get off lightly by avoiding an operation and having radiotherapy instead. Some patients said afterwards that they had suffered considerably as a result of the prolonged treatment and the reaction ; he had not had the same recriminations in the case of patients on whom he had operated.

In a few cases patients a year or two later had perichondritis after external radiation. (He was talking rather about deep therapy, not teleradium, but he understood that there was not very much difference between the two methods.) Those cases were very depressing. If a patient had a growth of low-grade malignancy and of suitable distribution, he would at present recommend laryngofissure because of these reactions. If irradiation technique improved, and these subsequent reactions were avoided, he might alter his opinions.

He did not think that laryngectomy was a difficult or dangerous operation, but he had found difficulty with a considerable number of patients in getting them to adapt themselves to their life afterwards. The hypertrophic laryngitis which went on to carcinoma should be treated by operation and so should cases with perichondritis. But if there were a carcinoma along the whole of one cord, extending to the posterior commissure, when surgical treatment would necessitate laryngectomy, the patient might be given the chance of radiation treatment. He had been told on the authority of radiotherapists that it was more scientific to use external radiation, but certainly the cases he had treated by implanting radium needles by the Finzi-Harmer method had done very well. They had a brief time in bed, with little suffering, and they had the advantage of the removal of the cartilage so that there was no irradiation through the cartilage, and there should therefore be no perichondritis.

C. P. WILSON said that though he had had the advantage of being associated with a first-class radiotherapeutic department, he had never seen radiotherapeutic results as good as those he had just heard about, nor had he ever seen surgical results which approached the results one heard about.

From the statistical point of view it would be interesting if some of their statisticians could take the figures which had been given by the first three openers and set them out on the basis which Colonel Harnett had given.

Concerning surgery following radiation there was one point he desired to make, namely, that surgery should never be attempted after a patient had had more than one course of radiation. From his own limited experience he would say that surgery was quite impracticable when there had been extensive radiotherapy. From the point of view of assessing cases suitable for one or other method of treatment he did not think they could go further than Mr. Negus had already gone. He knew of no method by which the cases likely to prove radio-sensitive could be assessed with any degree of probability.

L. GRAHAM BROWN said that he had seen a great number of cases of carcinoma of the larynx, but he had confined his operative procedure to simple carcinoma of the cord, preferring to refer other cases to radiation.

They were agreed that laryngofissure was a simple operation and a very

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

successful one. Concerning the other cases, considerable differences were noted ; sometimes the result was marvellous and at other times most depressing, but he thought that there was a great future for radiotherapy in these cases. It depended a great deal on whether they could get proper standardization of treatment.

He remembered in that Section some years ago drawing the fire of the late Sir StClair Thomson because he had not done a preliminary tracheotomy in cases of laryngofissure. He thought that with the great advance in technique, with the added benefits of intubation, and also with the use of the diathermy or cautery point, bleeding could be sufficiently controlled to get a dry field often without preliminary tracheotomy. He thought that this practice applied also in America to a considerable extent. A tracheotomy did retard the convalescence. In a recent case, after performing a successful operation of laryngofissure, feeling he should give the patient the benefit of the doubt, he sent him for a course of radiation. Unfortunately, although the patient made a quick recovery from the operation, he suffered for months afterwards from the radiation treatment.

Colonel N. CANFIELD (U.S.A.M.C.) said that he wished to mention that their war surgery during the last six months had shown the value of tracheotomy in treating wounds of the larynx, pharynx and jaws. Tracheotomy diminished the muscular action of the pharynx and larynx and these cases healed very much better. He thought this might possibly apply to cases in which a tracheotomy had been performed in preparation for laryngofissure.

E. D. D. DAVIS, in reply, said that the Harmer-Finzi operation appealed to him because it gave the right dose at the right spot. Mr. Harmer and his colleagues had worked out the technique very thoroughly. Teleradium and X-ray therapy produced burning and considerable skin irritation and discomfort. Two cases of laryngofissure in which it was thought the growth had not been completely eradicated were given teleradium as a prophylactic treatment. Both patients died of secondary growths of the liver within twelve months.

LIONEL COLLEDGE, also in reply, said that he had been sorry to hear that Mr. Musgrave Woodman was so " reactionary " on the subject of treatment by radium needles. It could not be anything like so scientifically accurate as teleradium, and the results which Dr. Lederman now obtained showed that teleradium treatment produced everything, in selected cases, that could be produced by other procedures. On the other hand, Dr. Lederman and Professor Mayneord have shown that if radium needles be used as the source of irradiation in the larynx the distribution in the horizontal plane shows a region of heavy irradiation at the anterior commissure, but falling off rapidly along the cord in the direction of the arytenoid cartilage. Morton, Gray and Neary also found by physical measurements that by the usual method of employing needles the anterior part of the larynx receives twice the dosage that reaches the posterior part. Therefore it is only a very small tumour which can receive a homogeneous dosage.

Much had been said about the loss of voice following laryngectomy. But this loss was not complete, and in some cases the patients held their own very well. He had in mind a solicitor, aged about 50, who had managed to conceal

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press

from everybody except his own doctor the fact that his larynx had been excised. He was a little husky, but no one in his own town knew that he had undergone an operation. With the co-operation of a speech therapist, the speech difficulty was no longer to be accounted among the disadvantages of the operation.

Dr. Finzi had suggested that the operations which followed radiation were more difficult if teleradium had been used than if the radiation had been applied by means of needles. On the other hand, there was a good deal of scarring in the neck if needles had been implanted, and, worse still, the cartilage on one side had been removed prior to the spread of the tumour. It had been his experience that operations had been more difficult after needling than after external radiation.

Mr. Graham Brown and some others were inclined to condemn tracheotomy as a first step. But in laryngofissure now and then the patient did bleed severely a few hours after the operation, and tracheotomy was a safeguard.

REFERENCES

LEDERMAN, M., and MAYNEORD, W. V. (1943) *Brit. J. Radiol.*, xvi, 301.
MORTON, J., GRAY, L. H., and NEARY, G. J. (1944) *Brit. J. Radiol.*, xvii, 204.

T. B. JOBSON asked whether Dr. Lederman was of opinion that the preliminary removal of cartilage on the side of the growth would increase the penetrative power of the rays and lessen certain risks.

M. LEDERMAN, in reply, said that in his view the removal of the cartilage would not be of any value and would certainly not affect the penetrating power of gamma radiation. Hautant in Paris at one time removed part of the thyroid cartilage, but the procedure had since been given up.

Replying to other points in the discussion, Dr. Lederman said that Dr. Finzi had mentioned the expediency of taking a soft tissue skiagram in these cases. That was done, plus tomography, in the cases he had described.

Mr. Negus and Mr. Davis had mentioned reactions. He had been at some pains to investigate this point. With teleradium the reactions were never as bad as had been supposed.

External radiation was the only method whereby the right dose could be introduced to the right spot. The whole weakness of the Finzi-Harmer method was that there was a tendency for a very large dose to be delivered to the anterior commissure, and only half that dose to the region of the posterior end of the cord.

https://doi.org/10.1017/S0022215100045539 Published online by Cambridge University Press