An Address ON INTRINSIC CANCER OF THE LARYNX, OPERATED ON BY LARYNGO-FISSURE:

IMMEDIATE AND ULTIMATE RESULTS.*

BY

SIR STCLAIR THOMSON, M.D.,
F.R.C.P., F.R.C.S.

INTRODUCTION.

To be your guest of honour on this important occasion—the fiftieth anniversary of the foundation of the first and most important society in America devoted to the specialty—is a pleasure and a dignity I deeply esteem. In preparing a communication for this Association I have done my best to make it worthy of your acceptance by seeing that it was comprehensive and complete. It includes every case of intrinsic cancer I have treated by laryngo-fissure; the after-history has, fortunately, been available in every instance, and nothing has been extenuated or set down in malice prepense. This record is the result of over twenty-eight years' experience in carrying on the pioneer work of Butlin and Semon.† It embraces my earliest efforts as well as the results of more mature knowledge and technique. It therefore, I hope, carries the lessons both of early anxieties and of increased experience. It is the largest personal record which has, so far as I know, been contributed to the subject. Although none of us is quite free from bias, I venture to claim that the work is sincere.

LARYNGO-FISSURE: A DEFINITION.

Laryngo-fissure is an inadequate expression to describe the operation I practise. Fissure of the larynx, or splitting the thyroid cartilage, or thyrotomy, should only be a term employed to indicate the route of approach. I also employ this route for a simple exploratory examination of the larynx. We may continue with the term "laryngo-fissure" in this sense; but students will start with mistaken ideas if they think that it still means simply "splitting the thyroid cartilage and taking out a vocal cord." The operation I practise means excising a mass which contains in its centre the whole cord, and includes the anterior commissure in front, part of the arytenoid behind, the ventricular band above, and the subglottic area below. This excision goes deeply enough to include the perichondrium lining the thyroid cartilage and, occasionally, that on the inner side of the cricoid ring. As the greater part of one thyroid ala is also excised (to obtain freer access and secure better healing) it will be seen that a so-called "fissure" really means a partial laryngectomy. Operations for malignant disease should be designed to meet variable conditions, the main object being to obtain a full-face view of the whole extent of the disease so as to remove it, with a satisfactory margin of healthy tissue in all directions, while securing the safety of the patient and avoiding unnecessary mutilation.

CLINICAL MATERIAL.

I have operated, through a laryngo-fissure, on 70 cases of intrinsic cancer of the larynx.

TABLE I.—Cases Operated upon by Laryngo-fissure (1900–1928).

	No. of Cases.	Private Cases.	Hospital Cases.	Age Limits.
Male	63	56	7	40–80
Female	7	4	3	35–58
Total	70	60	10	

Proportion of Male and Female Cases.

Looking at Table I we notice the large preponderance of males and of cases in private practice. Hospital patients

* Read, by invitation, before the American Laryngological Association at its semi-centennial meeting in Washington on May 1st, 1928.

† "For the cases recognized early and promptly operated upon by those best qualified to do so, the methods taught by Mr. Butlin have yielded results which may well be ranked among the chiefest triumphs of modern surgery" (D. Bryson Delavan, American Laryngological Association 26th Meeting, 1904, p. 167).

are only less numerous for the simple reason that the ignorant and uneducated do not present themselves early for what they regard as a trifling huskiness, or, if they do, will not accept advice until the lesion has so far advanced that complete laryngectomy is the only possibility.

Age Distribution.

In the next table (II) we note the incidence of my 70 cases according to sex and decade.

TABLE II.—Incidence, according to Age and Sex, of 70 Cases of Intrinsic Cancer of the Larynx.

Ages:	21-30.	31-40.	41-50.	51-60.	61-70.	Over 70.	Over 80.
Male	0	2	14	28	13	5	1
Female	0	3	2	2	0	0	0
Total (both sexes)	0	5	16	30	13	5	1

Here it is noticed that cancer of the larynx is not unknown between 30 and 40 years of age (of course, cases at much earlier ages have been recorded); that, in men, it may occur in advanced life; and that it appears to be most frequent with them in the sixth decade of life. With regard to the females in my list (7) the numbers are, perhaps, too small to justify many conclusions; but it is at least noteworthy that, with them, cancer would appear to be met with earlier in life and to be rarer after 60. All these women were non-smokers and abstainers.

Early Experiences.

All these 70 cases were operated on through a laryngo-fissure. The first case was twenty-eight years ago, in 1900, when I followed the technique I had learned at first hand from Butlin and Semon. It included the injection of morphine, the insertion of Hahn's tube, the curetting of the wound after piecemeal removal of visible disease, the abandonment of the tracheotomy tube at the conclusion of the operation, and the return of the patient to bed "with the head on a low pillow." As always happens when looking back on the road of surgical progress, one wonders at so many successes.

RESULTS.

Alive and Free from Disease.

My results are displayed in the following tables. The first shows that, of 34 patients alive to-day, 32 have survived periods varying from three to nineteen years from the date of operation.

TABLE III.—Thirty-four Cases of Intrinsic Cancer of the Larynx Alive and Well, Without Recurrence, after Laryngo-fissure.

Case No.	Age at Operation.	Sex.	Present Age.	Period since Laryngo-fissure.	Case No.	Age at Operation.	Sex.	Present Age.	Period since Laryngo-fissure.
6	59	M.	78	19 years.	45	35	F.	42	7½ years.
11	48½	M.	64½	16 "	47	60	M.	67	7 "
18	65	M.	78	13½ "	50	53	M.	58½	6½ "
21	66½	M.	80	12½ "	52	40	M.	46	6 "
22	59	M.	72	12½ years; 11 since gland operation.	53	58	M.	64	6 "
26	46	F.	57½	11½ years since first cord; 4½ since second cord.	54	58	M.	64	5½ "
27	57½	M.	69	11½ years.	55	47	M.	55	5½ "
29	47½	M.	59	11½ "	56	80	M.	85½	5½ "
31	50	M.	61	11 "	58	79	M.	84	5 "
32	53	M.	64	11 "	59	52	M.	57	5 "
33	67	M.	78	11 "	61	45½	F.	55	4½ "
35	60	M.	70	10 "	62	58	M.	61	3½ "
38	40	F.	50	9½ "	63	55	M.	58½	3½ "
41	33	F.	41½	8½ years since laryngo-fissure; 7½ years since partial laryngectomy.	64	74	M.	77	3½ "
					65	54	M.	57	3 "
42	48	M.	56½	8½ years	66	62	M.	65	3 "
44	58	M.	66	8½ "	69	56	M.	56	4 months.
					70	62	M.	62	2 "

Two cases are too recent to support any claim for prolonged cure, but their inclusion serves to illustrate other points.

Female Cases.

In this table the vitality of the females may be noted. Five out of seven are alive at periods varying from four and a half to eleven and a half years afterwards, although two of them have had to be treated for a recurrence. In Table IV it will be seen that the two other females in my collection (Nos. 12 and 35) survived fourteen and a half and nearly four years, to die, without any recurrence, of influenza and cerebral haemorrhage.

Healthy, Useful, and Prolonged After-History.

Attention might be directed to the advanced age of many of the survivors, to their health and vigour, and to the social well-being secured by having conserved a useful voice. No. 11 is a Canadian, sent to me sixteen years ago by Dr. Birkett, whose diagnosis was confirmed by you, Mr. President, clinically, and by Dr. Jonathan Wright from the biopsy. No. 18 is an active shipbuilder in Scotland. No. 21, in his eightieth year, writes that he still cycles. No. 31 is an admiral; he is devoted to social work and can address meetings in the open air. Four are physicians in active practice (Nos. 52, 59, 63, and 66).* Two are lawyers who conduct large affairs (Nos. 47 and 55). A clergyman is able to preach twice on Sunday (No. 44). A schoolmaster retains his post (No. 50). A gentleman, aged 67 when operated on, is now 78 (No. 33). Three years ago he passed safely through the operation for enlarged prostate. This year he celebrated his golden wedding and made a speech which was audible at a dinner he gave to 120 of his employees. No. 56 is a retired judge who follows the hounds on horseback, five and a half years after his operation and in his eighty-sixth year.

Deaths from Other Causes.

Of the 73 patients 18 have died from other causes, without recurrence (Table IV). Of these, it will be noticed that 13 had lived a minimum period of three years with-

TABLE IV.—Eighteen Deaths from Other Causes, Without Recurrence.

Case No.	Age at Operation.	Age at Death.	Period after Operation.	Cause of Death when Ascertainable.
2	49	50½	1½ years	Laryngitis.
3	48	58	10 "	Tubercle.
5	54	61	7 "	Unknown (hospital patient, inspected 2 years before death and found sound).
8	58	61½	3½ "	Aneurysm.
9	68	74	6 "	Bronchitis.
10	55	60-763	5-28 "	Pneumonia (an Indian subject).
12	53 (F.)	67½	14½ "	Influenza.
17	69	75	5½ "	Cerebral haemorrhage.
23	68	76½	8½ "	Urinary toxæmia.
25	72	84	12 "	Heart failure.
28	48	49	11 months	Developed pleuro-pneumonia with fetid empyema 1 month later. Operation: good recovery.*
30	63	65	1½ years	Angina pectoris.
34	75	85½	10½ "	Heart failure.
35	58½ (F.)	62	3½ "	Cerebral haemorrhage.
36A	70	74	4 "	Unknown.
37	69½	78	9 "	Heart failure; arterio-sclerosis.
40	56	56	50 hours	Operative (haemorrhage, morphine, pneumonia).
51	42	42	4 days	Operative (rupture of oesophagus).

*No details obtainable, but Logan Turner found no signs of recurrence two months before death.

out any recurrence, while 3 of them died ten or more years after operation. (The two "operative deaths" will be considered later.)

* Shown before the Royal Society of Medicine, November 4th, 1927. See *Proc. Roy. Soc. Med.*, December, 1927, *Laryng. Sec.*, p. 1.

Deaths from Malignant Disease Elsewhere, Without Recurrence.

If time permitted it would be interesting to study in detail the seven cases in the next table—that of death from carcinoma elsewhere, without local return of the disease (Table V). In two of them (Nos. 15 and 57) the virulence of the cancer must have been very intense, for glands in the neck were invaded within four and six months, and the patients were dead within seven and eleven months, although the larynx in each case was free from recurrence.

In contrast to these cases are Nos. 39 and 7, in which the glands did not develop until four and seven years after operation.

In Case 1 (the first I ever operated on) I watched the larynx remaining free, while a cancerous growth developed on the lingual tonsil on the opposite side.

Case 13 shows how a patient can remain free of disease, in excellent voice and vigour, for eleven years and then die of malignant disease so remote from the larynx as the gall-bladder and liver.

TABLE V.—Seven Deaths from Later Development of Malignant Disease Elsewhere, the Larynx Remaining Free.

Case No.	Age at Operation.	Time of Onset after Operation.	Age at Death.	Time Elapsed since Operation till Death.
1	47	Malignant disease at base of tongue opposite side, started 1½ years after operation. Larynx filled up 3 to 7 months after operation. Laryngectomy after 9 months, but no cancer growth found in excised larynx (? syphilis).	50	3 years.
7	43	Diffuse malignant disease in glands of neck 7 years later	51	7½ years.
13	58	Death from malignant disease in abdomen, found at operation too extensive for removal	69	11 years.
15	52	Infiltration of glands of neck within 4 months	52½	7 months.
39	64	Glands in neck	68½	4½ years.
43	54	Mediastinal glands (x-ray findings)	57	3 years.
57	39	Glands in neck within 6 months	39½	11 months.

Deaths from Local Recurrence.

We now come to the local recurrences. There were only 11, all males. It will be noticed in Table VI that in 8 of these the recurrence took place within the first year. This supports Semon's dictum that a recurrence generally takes place within the first twelve months. Personally I feel little anxiety if the third month passes without any suspicious symptoms.

TABLE VI.—Eleven Deaths from Local Recurrence.

Case No.	Onset after Fissure.	Period till Death after Fissure.
4	8 months	20 months and 12 months after total laryngectomy.
11A	24 to 6 months	29 months.
14	3 years	3 years (second laryngo-fissure; death from idiosyncrasy to heroin).
16	2 months	5 months.
19	3 years	4½ years.
20	3 months	1 year.
24	1 month suspicion, and certain in 4 months; tracheotomy at end of 5 months	15 months.
46	2 months (declined laryngectomy)	11 months.
48	2½ years	4½ years.
49	2 months	7 months.
67	2 months	4 months.

These early relapses should not be regarded as a "recurrence of disease." We are more likely to advance the subject if we frankly regard them rather as "incomplete removals," and then investigate why the operation was a failure, or why the case was unsuitable for this type of operation.

The other three re-growths developed three years after the laryngo-fissure. Case 14 was in a very alcoholic subject. The lesion occupied the anterior two-thirds of the right

cord, invaded the commissure, and descended into the subglottic space. Here I was a little doubtful of having secured sufficient margin, and the pathologist was unable to report a good circumference of healthy tissue. The patient returned to India (and to his alcohol and tobacco), was there inspected and passed from time to time, and returned exactly three years afterwards with a recurrence at the anterior extremity of both cords and in the subglottic space below the anterior commissure. At the second laryngo-fissure it was seen that the re-growth had originated in this area. His death from heroin (recorded under "operative deaths") was particularly disappointing, as the pathologist's report encouraged the hope that the second removal had been complete.

No. 19 was a case of long-standing hoarseness, in which a large growth was almost entirely located in the subglottic region, and required the exposure of the inner surface of the cricoid. The pathologist reported on the removed mass that "the growth has reached to the line of excision at two margins." Yet three clear and active years passed before there was any suspicion of re-growth. This occurred so stealthily in the subglottic area that, when it declared itself, the disease was too advanced for further operation.

No. 48 was a similar case, but more promising. The disease left each extremity of the cord free, but descended on the inner surface to below the level of the cord. Excision, to eye and touch, appeared to be satisfactory, but the pathologist reported "there cannot be much margin of safety posteriorly." The patient was regularly inspected, and remained quite free for three years, when the disease returned on the same side. Laryngectomy was recommended, but declined; he had radium treatment elsewhere, and died one and a half years after the return had been diagnosed. He, like Case 14, indulged freely in whisky and tobacco, both before and after laryngo-fissure.

In all these three cases it was the subglottic situation which thwarted success.

Operative Deaths.

Of the 74 laryngo-fissures performed on 70 patients (2 of the 70 having been operated on for a local recurrence and 2 requiring a supplementary laryngo-fissure) 2 have died within forty-eight hours of the operation. The first case, No. 14, has already been referred to in Table VI. He was successfully operated on in 1913. After three years' absence in India he returned with a local recurrence; a second laryngo-fissure passed off without untoward incident in 1916, but he died forty-eight hours later with drowsiness, contracted pupils, and complete suppression of urine. There was no unusual bleeding at the operation, but a small haemorrhage took place twenty-four hours after. During my absence he was given half a grain of heroin, in three doses of one-sixth of a grain, within twenty-four hours. One of these doses had not been ordered; yet half a grain was not a large dose. A tracheotomy tube had, fortunately, been left in after operation. Death appeared to be due to an idiosyncrasy for heroin in a very alcoholic subject.

The second case, No. 40, had suffered from syphilis of the larynx for four years before a subglottic intrinsic cancer developed. There was much bleeding at the operation and again within two hours. Through a misunderstanding more morphine was given than was intended—namely, three-quarters of a grain—and he died with symptoms of septic pneumonia within forty-eight hours of operation. A tracheotomy tube had been left *in situ*, on account of the free bleeding at the operation, the subglottic extension of the disease, and the syphilitic basis.

A third case, No. 51, died on the fourth day from rupture of the oesophagus, due to post-anaesthetic vomiting.

The last was a very rare accident, not connected directly with the operation. The other two occurred in very unpromising subjects, one being certainly syphilitic and both of them alcoholic. Still, I think death would have been avoided if no soporific had been given. I now refuse to give an opiate of any kind before or after operation, and I forbid all "dopes" before anaesthesia (mixed, local and general). Accepting these 3 cases as operative deaths, this would give a death rate of 4 per cent.—a very

different figure from that recorded by the pioneers of this subject, and from that still existing in the few statistics which are rarely published.*

If permitted to delete case No. 51 (rupture of the oesophagus) I have had no operative death since case No. 40. This sequence of 30 cases without a disaster encourages me to give it as my opinion that if a laryngo-fissure is carried out with the precautions and care I insist on, in regard to haemorrhage and the descent of blood into the bronchi, then it should be an operation free from any danger, except those incidental to all operations.

Lasting Cure.

We need not revive barren discussions as to how long after operation a patient may be regarded as permanently cured of cancer.

With few exceptions, all patients are in middle or advanced life. To ensure a comfortable and a vocal existence for ten to twenty years to 12 men who have passed their forty-seventh to sixty-seventh year (as in the first 12 cases of Table III); to operate on men of 79 and 80 years of age (Nos. 58 and 56), and to show them healthy and vigorous five years afterwards; and to restore doctors, lawyers, clergymen, and schoolmasters to their calling, are surely sufficient evidence to claim this method as securing permanent cures.

You, Mr. President, when addressing this Association on this same subject twenty-four years ago, said that "statistics based on alleged cures of less than three years' duration are worthless."

A scrutiny of the tables I have submitted will show that 63 patients are eligible on this basis, and that 48 of them were alive and well and free from recurrence at the end of three years.† This lasting cure of 76 per cent. has been obtained without restricting oneself to particularly promising cases. As the indications for laryngo-fissure have not yet been quite established—beyond that of being a suitable operation for many cases of intrinsic cancer—I thought it right to try it in various intralaryngeal manifestations of the disease. Although this may have impaired the statistical results, it has enabled me to form some clear conclusions as to the indications and limitations of the laryngo-fissure route for the eradication of intrinsic cancer of the larynx. These will be embodied in a forthcoming publication.

CONCLUSIONS.

I trust that the evidence I have submitted justifies the conclusions I have now formulated for some years. This latest and largest record satisfies me that if intrinsic cancer of the larynx is diagnosed early it is best operated on by laryngo-fissure—an operation which should be free from danger to life and followed by an adequate voice and a lasting cure. The only necessities for this consummation are early diagnosis and meticulous care in operative precaution and procedure.‡ By educating the public to pay prompt regard to persistent hoarseness, and by teaching the profession to appreciate the niceties and necessities of early diagnosis, the number of laryngo-fissures and the proportion of lasting cures will steadily increase, while the need for laryngectomy will as progressively diminish.

In other regions of the body there may be better remedies than surgery can supply. In intrinsic cancer of the larynx other, simpler and surer, remedies no doubt will one day be discovered; but, at present, there is no better way than surgery and the laryngo-fissure route. By this we can secure results which have not been surpassed in the treatment of cancer in any other internal region of the body.

REFERENCE.

* D. Bryson Delavan: *Trans. Amer. Laryng. Assoc.*, 26, 1904, p. 155.

* "The results of indiscriminate operation have been so bad that their records are unobtainable because suppressed" (D. Bryson Delavan, loc. cit.).

† These figures are arrived at by deducting from my 70 cases the 2 recent cases (69 and 70), the 3 who died of other diseases before the three years were completed (2, 28, and 30), and the 2 operative deaths (40 and 51). This leaves 63 cases on which to formulate results. On the other side of the balance sheet are the 32 three-year survivors in Table I; the 13 who died of other diseases after a lapse of three years (Table IV); and the 3 cases which succumbed to malignant disease in other parts of the body, four and a quarter, seven and a half, and eleven years after laryngo-fissure (Table V). These, added together, show 48 who had passed the three-year limit.

‡ "Mistakes hardly short of criminal have occurred in laryngeal operations done by inexperienced men working with absolutely no trained helpers" (D. Bryson Delavan, loc. cit.).