THE HUNTERIAN LECTURE ON WHAT OPERATION CAN DO FOR CANCER OF THE TONGUE.

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I.—THE ADVANTAGE OF EARLY OPERATION.

AMONG the problems on which my attention has been fixed for some time past in relation to the operative surgery of cancer of the tongue two have occupied the foremost place; and when I received the courteous invitation of your Society to deliver the Surgical Address for the year I determined to see what my experience would teach in regard to the necessity of removal of the entire tongue in every case of cancer, and what proportion of the patients die from affection of the glands of the neck without recurrence in the mouth. With these objects in view I began last October to put together all my cases, and to search out the further history of the patients. Excluding those in which I had not performed the first operation, and taking only my own proper cases up to the end of 1896, I found that I had operated on 102 patients. For the purpose of search and research they were divided into two groups—hospital and private; and when I had been some time at work I discovered that a comparison of the two groups would prove singularly interesting. By a curious chance they were almost equal in number—53 in hospital, 49 in private practice, so that they may be regarded as two practically equal groups. I had, of course, thought there would be some difference in the results of the operations in the two groups, for I knew that the mortality due to the operation itself was singularly small among my private patients. But I was quite unprepared for the much more satisfactory results, so far as cure of the disease is concerned, in the private patients. The results are compared in these two tables, and it will be seen that I have had the good fortune to trace all except 7 of the 102 patients, although some of them were operated on thirteen or fourteen years ago.

TABLE I.—Hospital Cases.

	Cases.
Died of operation	9
Lost sight of	7
Recurrence <i>in situ</i>	8
Affection of glands without recurrence	16
Died later, cause unknown (probably cancer)	4
Well within three years after operation	2
Well more than three years after operation	7
Total	53

TABLE II.—Private Cases.

	Cases.
Died of operation	1
Recurrence <i>in situ</i>	10
Affection of glands without recurrence	12
Died of other causes than cancer of the tongue within three years	4
Well within three years after operation	9
Well or died of other causes more than three years after operation	13
Total	49

The number of deaths due to operation in the hospital group is no fewer than 9, while I have only lost one of my private patients, a gentleman, for whom half the tongue back to the epiglottis, part of the floor of the mouth, and all the contents of the anterior triangle of the neck, were removed, and who died within a few hours of exhaustion. The number of cured cases—and by that I mean the persons who were alive and free from disease more than three years after the last operation, or who had died of some other cause after three years, in the hospital group—was 7, while the number in the other group was 13. And this table holds out hope of yet greater success, for there are still 9 of the patients well and free from disease between one and three years since the operation, while there are only 2 of the hospital patients who may still prove complete successes. The hospital group might furnish a little better return if I could trace each one of the 7 patients who have been lost sight of, but I doubt

whether I should find more than 1, or at the most 2, of them yet alive and well. So that the percentage of cured cases (on the three years' limit) would not even then amount to more than 16, or at the most 17, against 26 in the group of private cases, to which may still probably be added a large proportion of the patients who are alive and well during periods of shorter duration than three years.

Why are the results of private practice so much better than those of hospital practice? The answer to the question contains an admirable illustration of the justice of the claim which surgeons have made in regard to cancer operations during many years, that they would be able to show better results if they had the cases earlier for operation. The tongue is a part of the body in which the occurrence of cancer is usually detected at an early period, especially if the disease is situated in the anterior two-thirds of the dorsum or borders. People in good or even moderate circumstances are not only better educated in the possibility of cancer of the tongue, but they are more apprehensive of danger; and they will not put up with the fungating offensive masses of cancer which are so frequently seen in the mouths of hospital patients. I speak of the general rule, for now and then there come to me wealthy patients with such horrible cancers of the tongue as I should never have thought any person who could help it would bear, and I can only suppose that they were deterred from coming earlier by the fear of an operation. The condition of the tongue in many of the hospital patients has rendered large operations necessary. The same condition has made it impossible for the patient to be properly nourished before the operation, so that the chance of recovery from a severe operation is much smaller for the hospital patient. And I do think that these tongue operations do better, and are in less danger of septic pneumonia and the like, in private houses or in a well managed nursing home than in the open wards of a hospital. The explanation of the heavy mortality following operation on the hospital patients is, then, the extent of the disease and the bad condition of the patients. And the explanation of the much larger percentage of cures among the private patients is the comparatively early period of the disease at which the operation was performed.

The study of the cases which may be claimed as cured shows that the disease, in the large majority of them, was situated in the anterior two-thirds of the tongue. This is only what has been suspected and suggested, but hitherto I have not been able to prove it by a sufficient number of cases. That disease far back in the dorsum, or along the border in the neighbourhood of the anterior half-arches of the fauces, should be particularly fatal is also what might reasonably be expected. But there is evidence to show that even some of these cases may be treated with success, provided the disease has not invaded the tonsillar and neighbouring regions.

Among the private (cured) cases there is not one in which the glands were removed either at the time of the operation on the tongue or afterwards; and had the private cases been the sole material for study, the opinion might have been formed that affection of the lymphatic glands renders the prospect of a cure hopeless. The hospital (cured) cases correct this impression in a very striking manner. In 5 of the 7 cases the glands were removed at or after the operation on the tongue, and in 4 of the 5 they were not only enlarged, but were proved by microscopical examination to be cancerous.

II.—IS REMOVAL OF THE ENTIRE TONGUE NECESSARY IN EVERY CASE?

I have never been in the habit of removing the entire tongue as a routine operation in every case of cancer; and I did not know until lately that there are surgeons in London who feel the necessity of this practice so strongly that they decline to operate for the removal of half or a portion of the tongue. Let the following facts be studied by those who are interested in the matter. The whole tongue was removed in only one of my successful cases, whether in hospital or private practice, and not in one of the patients who are still alive and free from recurrence between one and three years after the operation. In the complete group of 102 cases, the entire tongue was only removed 16 times, and an analysis of those 16 cases discovers that 4 of the patients died of the

operation and 2 of them shortly after their return home to the country (of bronchitis and laryngitis); that 5 suffered from recurrence *in situ*, and that only 1 can be claimed to have been cured.

TABLE III.—*Removal of Entire Tongue.*

	Cases.
Died of operation	4
Died very soon of other causes	2
Recurrence <i>in situ</i>	5
Affection of glands without recurrence	1
Lost sight of	3
Well more than three years after operation	1
Total	16

This question of the removal of the entire tongue is one of considerable importance. The operation is much more dangerous than the removal of the fore part or of one half of the tongue. The patient is cruelly maimed, his speech is very defective; he has difficulty in taking solid food; he suffers from the collection of mucus and saliva in the mouth; and, if his occupation depends on speech, even in a moderate degree, he is forced to abandon it. The relation, therefore, of the removal of a part of the tongue to the removal of the entire tongue is widely different from the relation of the removal of a part of the breast to the removal of the entire breast. The latter is a disfigurement, the former is a serious mutilation. There is ample proof that removal of a portion of the tongue is sufficient to cure a considerable percentage of patients, and to save a much larger percentage from recurrence of the disease within the mouth. The operation of removal of the entire tongue as a routine operation can only be justified by proving, as far as it is capable of proof, that a very considerable proportion of the persons who suffer from recurrence in the mouth would have been preserved from that recurrence had the entire tongue been removed. My cases show that, out of some 66 patients¹ in whom local recurrence might have taken place, it was observed only in 18—little more than one quarter of the total number. In 5 of the 18 the entire tongue had been removed, and in 5 other cases recurrence took place in the floor of the mouth or in the anterior half arch of the palate, or in some part which would not have been more freely dealt with had the entire tongue been removed. In 2 instances the disease was found during the operation to extend back to the epiglottis, without producing obvious induration of the back part of the tongue, so that the incision, which was as far back as practicable, was actually through the disease. In one patient an error of judgment led to the removal of too small a portion of the tongue, so that there only remain 5 cases in which it is possible that removal of the entire tongue would have done more for the safety or comfort of the patient than was done by the smaller operation. In 2 of these I think that I should have done wisely to remove the entire tongue; but, in the remaining cases, a little more than was done would certainly have sufficed.

I always aim at removing the cancer with three-quarters of an inch of apparently healthy tissues around it in every direction. Where the disease is on the border of the tongue the routine treatment of my practice is to remove half the tongue to an inch behind the margin of the disease. In cases in which the disease is near the tip or forepart of the dorsum, the forepart of the tongue is removed. The results show how much can be done by such an operation in suitable cases.

TABLE IV.—*Successful Cases.*

Duration since operation:		
1 to 2 years	...	6
2 to 3 years	...	4
3 to 4 years	...	5
4 to 5 years	...	3
5 to 6 years	...	4
6 to 7 years	...	1
7 to 8 years	...	1
8 to 9 years	...	2
9 to 10 years	...	1
10 years	...	1
12 years	...	2
Total	...	30 cases

A comparison of these results with those which I was able to furnish ten or eleven years ago is so satisfactory that I am led to take a much more hopeful view of the operative treatment of cancer of the tongue than formerly. Barker's collected statistics,² which I then quoted, afforded only 5 per cent. of

cures (on the three years' limit) in a total of 170 patients. And, 70 cases which I had previously collected,³ and in each one of which a microscopical examination had been made, furnished a percentage of 8.5 cured cases. The analysis of my own 102 cases, hospital and private, furnishes a percentage of 20 cured cases. And, if the 50 private cases are analysed, the percentage of cured cases is 26, with a goodly number of promising cases, which may, in the course of the next two years, furnish several more cured cases. It seems fair to say that the prognosis of cancer of the tongue, when the disease is situated in the anterior two-thirds, whether in the substance or on the border of the tongue, is not by any means bad, when compared with the prognosis of cancer of most other parts of the body.

III.—WHAT CAN BE DONE TO PREVENT AFFECTION OF THE LYMPHATIC GLANDS?

Unhappily, the satisfaction which cannot but be felt at these improved statistics is tempered by considerations which have been disagreeably forced upon me from time to time, and which reached their climax in the course of the year 1896. Every surgeon who is accustomed to deal with cancer of the tongue knows that the glands are, in every case, liable to become cancerous, and that in some cases they become cancerous at a very early period of the disease. Von Winiwarter, in his excellent *Beiträge*,⁴ set down in a special table the period of the disease in which the glandular enlargement had first been noticed by the patient or his medical attendant. In most cases it was not until the disease of the tongue had existed for several months. But, in other instances, the glands were noticed to be enlarged within a few weeks of the outbreak of the primary disease. And, in a certain few cases, the glandular disease and the cancer in the mouth were discovered at the same time. My tables show how frequently successful treatment of the cancer of the tongue has been spoiled by secondary affection of the glands, which had appeared normal at the time of the operation. A series of cases which came under my notice during the year 1896 affected me deeply, for, in addition to the disappointment I experienced as a surgeon, I took great personal interest in several of the patients.

During that year it so happened that five persons for whom I had operated successfully for cancer of the tongue died of affection of the lymphatic glands. Two of the cases may be taken as examples of the whole. Captain B. first came under my care in February, 1894, when I removed from the border of his tongue a warty growth, which had neither the general nor the microscopic characters of cancer. In September, 1895, he had a small ulcerated epithelioma on the same border of the tongue, close to the scar of the previous operation. Half his tongue was removed, and the operation was quite satisfactory, for there was no recurrence in the mouth. But, within three or four months, the glands of the neck became enlarged, and when I saw him in April, 1896, the disease was advanced, and there was no hope of benefit from an operation. He died at the end of 1896, and his mouth was quite healthy to the last.

Mr. C. was sent to me in December, 1895, with a small flat epithelioma of the fore part of the dorsum of his tongue. He had only noticed it two or three weeks, and, as soon as he showed it to his medical man, was at once sent up for consultation, so that the least possible time was lost, and the removal of even a portion of the fore part of the tongue sufficed to secure him from recurrence of the disease. In August, 1896, he came to my house one morning to show me a swelling in the neck which he had only just discovered, and the importance of which he was well aware of. It was an enlarged gland situated over the bifurcation of the carotid artery, and was so little movable that I did not press the question of operation strongly, because it was not at all certain that an attempt at removal might not do him more harm than good. He died little more than a year after the operation on his tongue, and with the mouth quite free from recurrence.

In the summer of the same year a gentleman, whose case is not included in my tables, about 45 years old, making a large income as an accountant, and with a young family dependent on him, was brought to me by his medical man for an opinion on an enlarged gland behind the angle of the jaw.

It appeared to have arisen from a chill almost suddenly a few days previously; but a few months before a small epithelioma was reported to have been successfully removed from the corresponding border of his tongue. Within a fortnight of that time I tried to remove the gland, but found that it was only one of a series of cancerous glands which formed a solid mass beneath the parotid gland, and which were adherent to the most important structures in that region of the neck.

These cases produced so sad an impression on me that I began to review the whole subject of cancer of the tongue, and to consider what measures could be taken to avert these and similar catastrophes. Looked at in its proper light cancer of the tongue (squamous-celled carcinoma) is a malignant disease, but it is locally malignant, for it is so constantly limited to the tongue and the neighbouring lymphatic glands of the neck, that the prospect of dissemination of the disease may be dismissed. About 70 per cent. of the cases can be so successfully treated by operation that there is little fear of recurrence *in situ*; but of these 70 persons probably 30 will die, perhaps as many as 40, of affection of the glands of the neck. If these 30 or 40 persons could be protected against secondary affection of the cervical glands, there seems no reason to doubt that the lives of many of them might be saved. What means, then, can be taken for the protection of patients with cancer of the tongue against secondary affection of the glands? It must be admitted that we have yet no means of discovering which cases of cancer of the tongue are likely to be associated with secondary cancer of the glands, unless there is enlargement of the glands at the time of operation on the tongue. Nor can we foretell how soon the removal of the cancer of the tongue will be followed by secondary affection of the glands of the neck. Under these circumstances every patient with cancer of the tongue must be regarded as having the glands of the neck already inoculated with cancer, and if the inoculation is successful glandular disease will be apparent almost certainly within eight months of the operation.

Two alternatives at once suggest themselves—to clear out all the glands which correspond with the affected portion of the tongue, just as the axillary glands are cleared out as a part of the routine operation for cancer of the breast, or to remove the glands as soon as the slightest enlargement of them is apparent.

Let us take the latter alternative first on account of its plausible aspect. In favour of it may be urged that enlargement of the glands of the neck must necessarily be discovered early. The enlargement of the glands would determine which glands require removal. The patients (perhaps 20 per cent.) who are cured by an operation limited to the disease of the tongue would escape an unnecessary operation for removal of the glands of the neck. Unfortunately, experience shows that this expectant method is fraught with grave disappointment. By the time the glandular enlargement is apparent to the patient or his medical attendant, the affected glands are usually so fixed or so numerous, or both, that it is useless to attempt to remove them. The cases which have been mentioned are examples. In two of them the enlargement in the neck was shown to me within a few days of its discovery by the patient; but the glands were already so large and fixed that I could not press for a second operation. And to those who say, Why not at least attempt the removal? the reply must be that an unsuccessful operation may leave the patient in a much worse condition than if he had never been touched. Some years ago a retired officer of the army consulted me on account of an ulcerated cancer of the fore part of his tongue. I advised removal, and the operation was performed at Norwich. Within a few months he was sent to me again with an enlarged gland over the bifurcation over the carotid. I advised that it should be removed, and was then requested to perform the operation. I found a chain of glands adherent to the sheath of the carotid artery and jugular vein, and could only separate them with great care and difficulty. The wound had scarcely closed ere recurrence took place and it opened up again. The disease progressed with startling rapidity, and the patient, who was well before I interfered with his glands, suffered horribly from a few days after the operation until his death. The difficulty of discovering the glands through the structures which cover them sufficiently

early to remove them with success has been demonstrated in many of the cases under my care. In more than one of the fatal operation cases the *post-mortem* examination discovered cancerous glands which had not been felt, although they had been searched for when the patient was under an anæsthetic. And in one case in which I performed a set operation for the removal of what I believed to be sound glands, I found a cancerous gland as large as a filbert beneath and behind the submaxillary salivary gland. Yet the patient was thin, with a long neck, and the greatest pains had been taken to discover glandular enlargement.

As the expectant method offers so small a prospect of success, why not adopt the first alternative and remove the lymphatic glands at the time of the operation on the tongue, whether they are obviously diseased or not? Here, again, we are met by singular difficulties. In spite of the study which has been made of the lymphatics of the tongue and of the beautiful quicksilver injections by Sappey,⁵ the greatest uncertainty exists on the all-important point of the group of glands which is likely to be affected in any individual case of cancer of the tongue. Sometimes the affected glands are behind the angle of the jaw; sometimes they are in the floor of the mouth, behind the symphysis of the lower jaw; sometimes they are halfway down the neck on a level with the thyroid cartilage. No sufficiently regular rule seems to be observed to justify the removal of a particular group of glands in each case of cancer of the tongue. The knowledge of these facts has, no doubt, deterred other surgeons besides myself from a routine removal of the glands in cases of cancer of the tongue.

IV.—A ROUTINE OPERATION FOR REMOVAL OF THE GLANDS.

In spite of this uncertainty I have become so convinced of the necessity of a routine operation if cancer of the tongue is to be dealt with by operation more successfully that I have devoted a great deal of attention to the subject during the last two years. A study of Sappey's plates, aided by a careful

study of the clinical course of cases of cancer of the tongue in which the glands have been affected, shows that the lymphatics of the tongue are so disposed that they may pass through one or more of four groups of glands: (1) the sub-

mental group, which lie beneath the floor of the mouth behind the lower jaw; (2) the submaxillary, some of which actually lie in the substance of the salivary gland; (3) the parotid, and (4) the carotid, which lie over the course of the carotid artery and particularly over the bifurcation of the common carotid.

Speaking generally, it may be said that, although the lymph from the anterior portion of the tongue does occasionally pass, directly or indirectly, through the parotid group of glands, it does so only rarely, and the rule is that all the lymphatics from the anterior half of the tongue, whether from the dorsum, the border, or the under aspect, pass through one or more of the three anterior groups of glands. This is the more fortunate because the anterior half or two-thirds of the tongue is much more subject to cancer than the posterior part; also because there is much greater uncertainty respecting the relation of the parotid group of glands than there is respecting the relation of the three other groups. For example, I have not been able to discover whether lymphatic glands are embedded in the substance of the parotid salivary gland, as they frequently are in the substance of the submaxillary salivary gland. So far as the majority of cancers of the tongue are concerned, especially of the cancers which can be removed so that they are not likely to recur within the mouth, it may be foretold that they will inoculate one or more of the three anterior groups of glands, particularly the submaxillary and carotid groups. The removal of these three groups, then, would offer a reasonable prospect of preserving the patient, in any given case, from glandular affection. And if, in addition, the parotid glands, or those of them most likely to be affected, could be removed during the same operation, an increased prospect of success would be afforded. With this in mind I have devised and carried out on many occasions during the last eighteen months or two years, an operation which removes all the contents of the great anterior triangle of the neck, including the submaxillary salivary gland. And, although I have not yet operated on a sufficient number of cases, and time enough has not yet elapsed to allow the routine to be judged, the results have already been so good as to encourage an extended trial of the method of operating.

The time has not yet arrived to give an account of the operation, further than to say that the anterior triangle is thoroughly exposed by an incision about 7 inches long on the anterior border of the sterno-mastoid muscle from the mastoid process to below the thyroid cartilage, and a second incision from the symphysis of the lower jaw to the first incision about the upper level of the thyroid cartilage, and raising up the two triangular flaps which are thus mapped out. The dissection is commenced from the apex of the triangle, below, and carried upwards. The large vessels are exposed for a considerable distance. The vessels which are cut are clamped before, or as, they are divided; and, finally, the submaxillary salivary gland is taken out. A very careful dissection is made of the triangle, so that the connective tissue and glands are all taken out in one continuous mass. Search is made between the muscles in front for one or two deeper-seated lymphatic glands, and the glands in front of the parotid gland and about the angle of the jaw are removed with the other contents of the triangle. The submental and parotid glands are not so easily and certainly removed *en masse* in this operation as the submaxillary and carotid groups. Both the latter groups are very readily removed, and require no special search to be made for them. This is fortunate, because they contain the lymphatic glands, which are by far the most likely to be affected. The dissection occupies from an hour to an hour and a quarter, but the wound heals very rapidly, so that patients have been able to go out of doors eight or ten days after the operation. At first I performed it at the same time that I removed the affected portion of the tongue. But, experience has taught me that this is too hazardous. The disease of the tongue should be first removed. And, when the patient has had time (three or four weeks) to recover from this operation, and can take food well, the removal of the contents of the anterior triangle may be undertaken without fear. Both within the hospital and out of it I do my best to persuade nearly every patient who comes to me with cancer of the tongue to submit, after the removal of the cancer, to the operation on the glands of the neck. In

the course of the next two or three years I hope to be able to judge of the results of this preventive method. Thus far, I can only say that the glands have been found to be enlarged, but not cancerous, in several cases in which no enlargement was suspected. And, in one instance, to which reference has already been made, a cancerous gland, as large as a filbert, was removed with the submaxillary salivary gland, by which it had been shadowed and concealed. I shall at some future time publish a more detailed account of the steps of the operation, and a note of the patients on whom it has been performed, and of the fortune, good or bad, which has attended it.

In the meantime, I trust that the results which have been recorded in this paper will serve to encourage medical men and their patients to take a more hopeful view of the operative treatment of cancer of the tongue, particularly when the disease is situated in the anterior two-thirds of the tongue, and, above all, when the operation is performed at an early period of the disease.

NOTE AND REFERENCES.

¹ These 66 patients are made up of the 18 patients who actually suffered from recurrence *in situ*, 28 who died of affection of the glands without recurrence in the mouth, and 20 patients who remained well more than three years after operation. ² Holmes, *A System of Surgery*, 3rd edition, 1883; *Diseases of the Tongue*, E. A. Barker, vol. ii, p. 604. ³ *Sarcoma and Carcinoma*, 1882, p. 156. ⁴ *Beiträge zur Statistik der Carcinome*, p. 214, Stuttgart, 1878. ⁵ *Anatomie, Physiologie et Pathologie des Vaisseaux Lymphatiques considérés chez l'Homme et les Vertébrés*, Paris, 1874-85.

THE LETTSOMIAN LECTURES

ON THE

AFFECTIONS OF THE URINARY APPARATUS IN CHILDREN.

Delivered before the Medical Society of London.

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LECTURE II.

TUMOURS OF THE KIDNEY.

THE tumours of the kidney in childhood are almost without exception malignant, and the great majority are of the nature of sarcomata, though a few bear affinities to the adenomata, and in rare instances show pigmentation. They are by far the most frequent of all malignant tumours occurring in the abdomen in childhood, and originate either from the cortex, and invade the gland, or in the perirenal tissue. Very rarely they commence in the adrenals, sometimes surrounding, sometimes infiltrating, the whole of the kidney. By pressure the tumour may cause hydronephrosis, and adhesions may be found to other structures. The pressure effects may cause ascites or œdema of the lower extremities. They are frequently bilateral. Neither traumatism nor antecedent disease has much to do with their origin.

Occurring for the most part in very early life, and confined at first to one side of the abdomen, they present a smooth rounded outline, as distinguished from the sharp edge of an enlarged liver, or the notched surface of a hypertrophied spleen. On bimanual examination they are found to be movable, but attached to the neighbourhood of the lumbar spine. They grow forwards, and do not bulge in the lumbar region. Though dull on percussion, except where crossed by intestine, they are often so soft as to give an obscure sense of fluctuation, and have thus been mistaken for ovarian cysts. They are invariably crossed by a portion of the colon, and in an early stage are influenced by the movements of respiration. There is generally a space into which the fingers can be pressed between the upper margin of the renal growth and the ribs.

So rapid is usually the advance of these neoplasms that they present only two symptoms in their earliest onset, namely, that of a large rounded tumour commencing in the loin, which most often is the first indication, and hæmaturia. In 12 per cent. this latter is said to be the primary symptom. Both might well, in the earliest onset, be mistaken as due to