A Clinical Lecture ON CANCER OF THE CERVICAL OESOPHAGUS.*

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I HAVE chosen this subject for my lecture as, in the first place, cancer of the cervical portion of the oesophagus is a condition frequently met with, and operative technique has advanced so far in recent years in the treatment of this condition that not only is it possible at times to remove the growth, but even to restore the continuity of the tube by plastic procedures. In the second place, the extension of the growth into the thyroid is not so rare as one would be led to suppose by the almost complete absence of any mention of this condition in the textbooks,† whilst the clinical picture which is sometimes offered by this direction of spread may, unless one is aware of the possibility, lead to the erroneous diagnosis of primary carcinoma of the thyroid, as happened in one of my cases.

I shall begin by giving a brief sketch of the symptoms and physical signs of an uncomplicated case of carcinoma of the cervical oesophagus, shall then deal with the complications in the clinical picture produced by extension of the growth into surrounding parts, and, lastly, describe the operative treatment of the condition.

The disease manifests itself usually after the age of 45, but the age of the earliest case on record was 19. Men are more frequently affected than women, in the proportion of 7 to 3, whereas pharyngeal tumours seem to be more common in women. The cervical portion is said to be the seat of the lesion in about 12 per cent. of all cases of cancer of the oesophagus.

PATHOLOGY.

The commonest form of carcinoma is the squamous epithelioma with a tendency to well-marked cell-nest formation. More rare is the softer medullary carcinoma with cubical cells and large alveoli, originating in the glands; and occasionally very hard carcinomata of the scirrhus variety, with abundant fibrous tissue and very few cells, are met with.

The squamous epitheliomata are at first usually firm, flat, greyish-white tumours involving part of the circumference of the oesophagus; at first covered by epithelium, they later undergo ulceration, which is brought about either by irritation of the surface by food or through the decomposition of the particles of food which become lodged above or on the growth. As the tumour increases in size, it tends to encircle the lumen; it may remain a flattened ulcer, or be irregularly proliferating. The margin of the ulcer is hard and infiltrated, and it is this which produces in the main the stenosis. The medullary carcinomata proliferate much more rapidly, and produce irregular cauliflower-like growths which disintegrate early. The scirrhus carcinomata, as one would expect, produce the greatest amount of stenosis by the contraction of the abundant fibrous tissue.

The growth at first remains limited to the mucous membrane and submucous tissues, but later spreads into the muscular wall, and eventually perforates the oesophagus. Once outside, the rate of growth seems to become much more rapid, and the surrounding structures become involved by the neoplasm proliferating into the loose areolar tissue. The rapid increase in the size of the tumour, formed once the cancer has begun to spread externally, is undoubtedly in some considerable part contributed to by the septic infiltration brought about by the spread of infection through the perforation of the oesophagus. In the immediate neighbourhood of the primary growth collections of cancer cells forming small tumours in the course of the lymphatics can frequently be seen. Occasionally a second carcinomatous growth will be found at some

distance from the first. This occurred in one of the cases I shall describe later; the main growth was opposite the upper tracheal rings, and a second smaller one was situated at the level of the bifurcation of the trachea; the intervening mucous membrane had the appearance of being perfectly healthy. It is interesting in this connexion to note that a second growth at some distance from the primary growth may also be found in the colon and rectum. The fact that solid food passes through the oesophagus, and that in the colon the intestinal contents are again becoming solid, suggests the possibility that the second growth may be due to implantation from the primary tumour.

There is almost always some dilatation of the oesophagus above the growth.

SYMPTOMS.

Those due to the presence of a carcinoma confined to the oesophagus are few in number, and cases have been described where a growth unsuspected during life was found *post mortem*. Usually the first and most constant symptom is the feeling that the food gets stopped when it reaches some point in the oesophagus—a spot quite easily localized when the cervical part is involved. This “sticking” of the food is generally first noticed when some mouthful larger or drier than usual is swallowed, and it may subsequently for some weeks, or even months, be a very variable symptom, the patient at one time swallowing solids easily, and at another being only able to take fluids or semi solid food. This variation sometimes leads to the erroneous diagnosis of hysteria. Eventually, however, the obstruction to solids becomes permanent, and later even liquids cannot be swallowed. At the seat of arrest there is often some pain. Regurgitation of food in an unaltered condition becomes a frequent symptom, and when the growth is situated close to the opening of the larynx there may be overflow into the larynx, producing spasm of the vocal cords and cough. When ulceration takes place, the food may return streaked with blood, and even pieces of growth may be brought up. With the extension of the disease and the increasing difficulties in taking nourishment there is progressive wasting and weakness, and as the obstruction becomes more complete thirst causes great discomfort.

During this stage there is no swelling to be felt in the neck, though at times there is some forward projection of the trachea; but the position and amount of constriction caused by the cancer can be ascertained by the passage of bougies, whilst the exact appearance of the upper part can be seen by direct oesophagoscopy.

With the extension of the growth beyond the oesophagus there is usually increase in the pain, due to the involvement of more sensitive parts, and even of nerves, such as the cervical or brachial plexus, and due, in addition, to the presence of inflammatory infiltration in the tissues of the neck.

When the growth is at the upper end of the oesophagus it may extend to the larynx and produce the picture of a subglottic growth, while symptoms of dyspnoea and aphonia may be present, owing to the oedema produced by inflammation in the neighbourhood of the tumour. Ulceration of the tumour into the lower part of the larynx generally gives rise to some cough, and the patient brings up a considerable amount of secretion, composed partially of discharge from the surface of the growth and partially of mucus due to the increased activity of the mucous glands in the neighbourhood. These cases may at any time develop pneumonia from inhalation of the septic products of the growth. Even in those cases where the oesophageal cancer does not penetrate into the trachea there may be very marked thickening of the lining wall. This thickening, which was present in one of my cases, produced such marked narrowing of the trachea that the lumen was reduced by three-fifths, and there was consequently shortness of breath on the least exertion. The thickening, though it has the naked-eye appearance of growth, is in reality due to a hypertrophy of the mucous glands and of fibrous tissue.

At times the growth extends backwards and produces erosion of the vertebrae. There is then generally marked increase in the pain, limitation of movements of the neck, and a curved rigid spine may result. Growths have been described which produced pressure on the spinal cord. The common carotid artery and the internal jugular vein

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† McCrae, in his article on Diseases of the Oesophagus, in Osler and McCrae's *System of Medicine*, gives a special paragraph on extension to neighbouring structures, but does not even mention the thyroid gland.

are the two vessels most often implicated, but the subclavian, thyroid, and vertebral arteries may be also affected. The growth tends to surround the arteries and compress them, so that in the case of the carotid a distinct difference can be detected when examining the corresponding facial arteries or any of the other branches. At times, however, the growth ulcerates into the vessels, and then the termination is usually caused by a rapid uncontrollable haemorrhage. In the case of the veins, however, thrombosis usually occurs early, and produces obliteration before either haemorrhage or compression occurs. Rarely the thoracic duct is involved on the left side, and complicates the picture by the oedema and ascites which may ensue. The symptoms most commonly produced are those due to involvement of nerves. Pressure on the recurrent laryngeal gives rise at first to stridor and hoarseness; later, when the adductor fibres are paralysed as well as the abductor and the cord assumes the cadaveric position, there may be improvement in both the stridor and hoarseness. Paralysis of the sympathetic gives rise to a contracted pupil on the same side, narrowing of the palpebral fissure and enophthalmos. There are usually no symptoms to be recognized in connexion with involvement of the vagus. Rarely the growth extends to and surrounds the brachial plexus, and produces considerable pain in the area of distribution of the affected nerves. Lastly, there is the invasion of the thyroid; but, before dealing with that, one word must be said concerning the spread of growth to the glands. The enlargement of glands, often on both sides of the neck, does not usually take place till late in the course of the illness, but it is possible that the deep cervical glands are affected for some time before this can be recognized clinically.

INVASION OF THE THYROID.

During the last five years there have been 4 cases of carcinoma of the cervical oesophagus, with secondary invasion of the thyroid, in University College Hospital. In 3 of these cases the diagnosis was confirmed by *post-mortem* examination. Two of the cases gave the ordinary history of carcinoma of the oesophagus.

The first of these was admitted in 1904. A. C., aged 59, gave a history of dysphagia of six months' duration, some dyspnoea for two months, and he had noticed a swelling over the thyroid for one month. On admission he had constant stridor and a very weak voice, and there was "weakness" of the right vocal cord. In the inner part of the right posterior triangle, in the situation of the lateral lobe of the thyroid, was a hard mass attached to the trachea, and moving upwards during deglutition. There were in addition numerous hard enlarged glands in both posterior triangles. The patient died two days after gastrostomy, and the necropsy showed extensive infiltration of the thyroid. This case had two carcinomatous growths, one opposite the cricoid and the other opposite the bifurcation of the trachea.

The second case (J. S., aged 61) I saw in the out-patient department in August, 1909. He had suffered from progressive difficulty in swallowing both solids and fluids for one year; he complained also of some pain in the upper part of his chest and of bringing up phlegm. During the last month his voice had been husky. Oesophagoscopy showed obstruction opposite the upper tracheal cartilages. The isthmus of the thyroid was slightly enlarged, fixed, and did not move well with deglutition. The lateral lobes did not seem to be enlarged, but were somewhat adherent to the surrounding structures. A few small glands could be felt in the lower part of the posterior triangle. The left vocal cord was in the cadaveric position. An exploratory operation was done, but it was found that the growth involved the trachea and extended down below the clavicles and the first rib. The wound was therefore closed. The patient died on the third day from a sudden attack of syncope.

At the *post-mortem* examination a soft growth was found involving the whole circumference of the oesophagus; the tumour had extended also into the posterior mediastinum. At the level of the upper border of the sternum there was a perforation into the trachea into the lumen of which a nodule of growth the size of a pea was projecting. On the left side the growth was invading the lateral lobe of the thyroid, and sections of this gland show masses of squamous cells in the fibrous tissue of the capsule and extending among and replacing the alveoli of the thyroid gland. In some of the alveoli at a part not invaded by the growth there is proliferation of the lining membrane, the cells of which have become detached, swollen and vacuolated, and are lying scattered in the colloid, which in these alveoli is rapidly disappearing. The growth from the oesophagus is a squamous-celled carcinoma.

In both cases, then, it is seen that the thyroid gland was invaded, and in both the invasion could be recognized clinically. Although in neither case could a radical operation be performed, yet it does not necessarily follow that all cases in which this gland is implicated are necessarily hopeless. It is, of course, certain that the disease is

advanced, and that probably the adjacent part of the trachea will have to be removed as well as the oesophagus, lateral lobe of the thyroid and adjacent vessels and nerves; but it is quite possible to support life under such conditions, and for the patient even to talk and swallow his food.

The other two cases are, however, much more interesting, in that they offer a clinical picture which suggests strongly a primary carcinoma of the thyroid.

The first of these (J. H., aged 51), was an in-patient in this hospital in 1904. The man came up complaining of hoarseness, cough and shortness of breath, which had been present for eight months; four months ago he first noticed some lumps in his neck, whilst only for the last five weeks had there been any difficulty in swallowing. The patient was very hoarse and had a constant cough. There was an ill-defined swelling and induration at the root of the neck; the swelling was more distinct on the right side close to the sternum; from this part it spread forward into the thyroid, where it again became ill-defined. There were several hard enlarged glands in the right posterior triangle. There was abductor paralysis of the right vocal cord and irritation of the right sympathetic. The patient had difficulty in swallowing solids and only a small-sized oesophageal bougie could be passed. The patient left the hospital without operation.

Last of the cases is the woman (A. A., aged 33), on whom I operated for carcinoma of the thyroid. She came to the hospital complaining of swelling in the neck of four months' duration, huskiness of the voice of three weeks', and shortness of breath of one week's duration. In answer to a question, she said that she had had some difficulty in swallowing solids for the past fortnight. Both lobes of the thyroid were enlarged, but the left more so than the right. The outline of the left lobe on the inner side was quite distinct, but on the outer and posterior aspect it faded off into a deeper mass of induration. The lobe was very hard and fixed. The carotid could not be felt on this side, as it was included in the induration but not compressed. There were a few hard, slightly enlarged glands in the left posterior triangle. When first seen there was abductor paralysis of the left recurrent laryngeal, and a week later complete paralysis. No bougies were passed into the oesophagus. I made the diagnosis of carcinoma of the left lobe of the thyroid, and thought the right might also be affected. At the operation, therefore, I first explored the right lobe, but found no evidence of growth. The left lobe, however, was definitely affected, and the growth appeared to extend from it and to surround the carotid sheath. The jugular and common carotid were ligatured both above and below and cut through; that portion also of the vagus which went through the growth was excised.* I found afterwards, however, that the growth, although surrounding and slightly adherent to the common carotid and vagus, was not actually involving them. The left lobe of the thyroid was freed at its upper and lower poles, and then separated from the trachea and isthmus. It was now evident that the growth invaded the oesophagus, and in effecting the separation an opening was made into the latter. The patient's condition was very good for the next forty-eight hours, and then she became restless, comatose, and died.

At the *post-mortem* examination a carcinoma of the oesophagus was found extending for 2 in. down from the level of the cricoid. The growth had involved all the coats on the left side and had extended into the neck, surrounding the carotid sheath and producing thrombosis of the jugular vein, and invading the left lobe of the thyroid (Fig. 1). Near the lower border the growth was beginning to perforate the trachea. The lumen of the trachea, however, and of the lower part of the larynx was much diminished by hypertrophy of the mucous glands, increase in fibrous tissue and to a small extent round-celled infiltration. The microscopic character of the growth is that of a squamous carcinoma (Figs. 2 and 3), with considerable tendency to cell-nest formation. Sections of the thyroid gland show columns of squamous carcinoma penetrating the fibrous capsule, which is considerably thickened (Fig. 4), while large masses of these cells can be seen extending between the alveoli and in places destroying and replacing them (Fig. 5).

It is thus evident that in certain cases the signs of the extension of the growth in the thyroid may be maximal while those of the primary oesophageal tumour are minimal, giving the clinical picture, that is to say, of a fairly advanced case of malignant disease of the thyroid. When, however, the possibility of such an error is recognized, avoidance of it can be ensured by the examination of the oesophagus with the oesophagoscope. The presence of this condition does not necessarily mean that the case is inoperable, though it does mean that it is only by an extensive operation that the disease can be removed.

TREATMENT.

The results of operations upon the oesophagus are probably more depressing than those of any other region. The oesophagus is only readily accessible in a very short part of its course, and until quite recently the intrathoracic part was regarded as practically outside the range of

* There was no obvious alteration in either the pulse or respiration when this was done.

operative interference on account of the fatal results which attended the efforts of those surgeons bold enough to attempt relief. The introduction of the "Ueberdruck" and "Unterdruck" mechanisms for preventing the collapse of the lung on opening the pleura does, however, hold out hopes for the future. In the neck, where the oesophagus can be reached without such attendant dangers, the advance of the disease, either before it is diagnosed or before it reaches the surgeon, often precludes either an attempt at removal or, at any rate, its success. Here, again, there should be some considerable hope of advance, in that, whereas before the sole method of confirming the diagnosis was by the passage of bougies, which in cases of a flat non-ulcerated growth

upper part of the oesophagus should be examined with the oesophagoscope without delay. As soon as the condition is diagnosed operation should be undertaken in order at any rate to attempt to excise the growth, instead of waiting until the patient is reduced by the increasing difficulty in swallowing, and then doing a gastrostomy, as too often happens.

The chief facts of the treatment may be summarized in a few sentences:

1. The technical difficulties in the actual removal of an operable growth are never great and the operation in itself is not dangerous.

2. The main objections to the operation are the great dangers of spreading infections in the cases where the oesophagus cannot be closed

Fig. 1.—Longitudinal section of the left lobe of the thyroid. $\times 1$. Showing invasion of gland by squamous carcinoma.

Fig. 2.—Squamous carcinoma of oesophagus. $\times 100$.

Fig. 4.—Thyroid gland and capsule. $\times 100$. Showing carcinomatous cells invading capsule.

might fail to establish any marked degree of stricture, we now possess in the oesophagoscope the means of seeing the form and extent of the upper extremity

completely; and, should the patient survive this danger, the troubles consequent upon the mutilation involved.

It is generally impossible to know exactly the longi-

Fig. 3.—Squamous carcinoma of oesophagus. $\times 400$. Showing cell-nest formation.

Fig. 5.—Invasion of thyroid gland by squamous carcinoma. $\times 400$.

of the growth and its nature, though not the actual length. It is absolutely certain, then, that every case which shows symptoms suggestive of carcinoma of the

tudinal extent of the growth until the oesophagus has been opened. In accordance with the state of affairs found the operations may be divided into four groups:

1. Where the growth extends too far into the posterior mediastinum to permit of removal.

2. Where a small part only of the circumference of the oesophagus is involved.

3. Where the whole or greater part of the circumference is invaded by tumour but the total length does not extend to more than 2 cm.

4. Where the length is greater than 2 cm. or there is involvement of the trachea or larynx in addition.

In the first case, of course, further operation is impossible, and the oesophagus must be closed by two rows of sutures.

Cases which come into the second group are unfortunately but rarely seen. In recent years there has been only one such case operated on in this hospital; in this patient a longitudinal ulcer, 2 cm. long, was excised from the oesophagus, and the wound was closed along the greater part of its extent, but the patient unfortunately died some days later owing to the spread of infection into the surrounding tissues.

When the growth involves the greater part of the circumference of the oesophagus but has not spread beyond the outer coat, and is not more than 2 cm. in length, then it is possible not only to excise that portion of the tube with a margin of healthy tissue above and below, but also to bring the two cut ends into apposition and to suture them together. Leakage, however, is apt to occur, and therefore the outer wound should not be completely closed, so as to allow for drainage. It is most essential, however, to limit the spread of the discharge from the oesophagus into the wound; this can be done to a great extent by deep stitches, bringing into apposition the surrounding muscles, and covering, as far as possible, the carotid sheath by suturing the adjacent muscles over it. The escape of septic matter from the oesophagus may then be regulated to the track left open for it. Another precaution is the introduction of a Gluck's oesophageal tube into the oesophagus; the dilated upper end rests on the back of the tongue and catches most of the saliva that is swallowed; and also later, when the patient is taken off rectal feeds, the fluids swallowed are conveyed by the tube to a portion of the oesophagus well beyond the anastomosis. Apart from the actual technique in the removal of the affected portion of the oesophagus, the essentials to success are the thorough cleaning of the mouth and removal of carious teeth before the operation, the introduction of a Gluck's tube as soon as the anastomosis is complete, and the approximation of all the adjacent structures between the skin wound and the oesophagus so as to prevent the spread of infection among the tissues of the neck. In all cases, of course, in which an excision of the growth is effected the glands, whether obviously involved or not, must be dissected out.

Finally, we come to the last group of cases—those in which the ends of the oesophagus cannot be approximated after removal of the growth, and in which perhaps, also, a portion of the trachea has to be excised. As to the latter, all that need be said is that the lower end must be sutured into the wound and a tracheotomy tube tied in. Later the patient can learn to speak quite comfortably with a Gluck's phonation apparatus. The upper and lower ends of the divided oesophagus must also be drawn out and sutured to the skin; the patient can for the time be fed through the lower opening, and the secretions escaping from the upper end can be controlled by an oesophageal tube passed down the pharynx, out of the upper oesophageal opening and in again at the lower opening. By this means also the patient can enjoy the pleasure of swallowing his own food. Later a plastic operation can be undertaken to restore the continuity of the oesophagus. This is done by replacing the excised portion by a tube formed from the skin which lies between the two cut ends of the oesophagus. The skin is freed on either side and the edges rolled over and sewn together, so that the outer surface of the skin now forms the inner lining. The ends of the new tube are now united to the cut ends of the oesophagus, and the whole covered over by undercutting the skin on either side and stitching these flaps together over the raw surface.*

* A very full account of plastic operations for restoring the continuity of the oesophagus can be found in Professor von Hacker's paper, *Ueber Resektion und Plastik am Halsabschnitt der Speiseröhre, insbesondere beim Carcinom, Verhandlungen der deutschen Gesellschaft für Chirurgie*, Thirty-seventh Congress, Berlin, 1908.

When the upper end of the divided oesophagus is so close to the pharynx that it cannot be brought out of the wound, then precautions must be taken to provide for the escape of the secretions in the same way as described in the operation of excision and end-to-end anastomosis.

ON THE RADICAL OPERATION FOR CANCER OF THE PYLORUS:

WITH ESPECIAL REFERENCE TO THE ADVANTAGES
OF THE TWO-STAGE OPERATION AND TO THE
QUESTION OF THE REMOVAL OF THE
ASSOCIATED LYMPHATICS.*

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THE subject of the radical treatment of cancer of the stomach by surgical operation is one on which a great deal of work has recently been done. And yet, owing chiefly to the long delay which occurs before the cases are submitted to the surgeon, the immediate mortality is very high and the proportion of lasting cures is disappointingly low. It is my object to discuss the causes and remedies for this state of affairs and to support the following propositions:

1. There is a good prospect of cure in early cases of the disease.

2. That exploratory operations should be performed for diagnostic purposes in all doubtful cases.

3. That the immediate operative mortality may be greatly reduced by operating in two stages.

4. That a more systematic attempt should be made to remove the whole of the lymphatic area connected with the stomach.

5. That the limits of operability, both for palliative and radical operations, should be more rigidly defined, so as to lessen if possible the number of surgical failures.

The following table shows the chief features of the cases upon which I have myself operated:

Order.	Sex.	Age.	Length of History.	Pain.	Vomiting.	Emaciation.	Tumour.	Free HCl.	Operation.	Interval.	Result.	Remarks.
1	M.	57	8 mths.	+	+	+	-	-	Billroth I	-	D.	Died on third day, probably from leakage.
2	F.	36	12 mths.	+	+	+	+	-	Two stage	7 days	R.	Lived for seven months and then died of uraemia.
3	M.	66	9 mths.	+	+	+	?	-	Two stage	7 days	R.	Died of recurrence nineteen months later.
4	M.	55	5 years	+	+	+	?	-	Two stage	12 days	R.	Alive and well now after two and a half years; a very early cancer growing in a chronic ulcer.
5	M.	32	2 mths.	+	+	?	?	+	Two stage	10 days	R.	Alive and well now one and a half years after operation.
6	F.	38	4½ mths.	+	+	+	+	+	Billroth II	-	D.	Died seventeen days after of asthenia.
7	M.	54	12½ mths.	+	+	+	+	-	Two stage	12 days	D.	Died of shock two hours after the operation.
8	M.	49	3 mths.	+	+	+	-	-	Two stage	30 days	R.	Alive and well (three months).

It will be noted that of these cases 6 were men and 2 women, and that the ages varied between 32 and 66. In 6 cases I operated in two stages with only one death, whereas in the two cases in which excision and anastomosis were done at the same time both died. Other points which require further notice can be more conveniently discussed under the various headings into which the subject naturally divides itself.

* Part of a paper read before the Surgical Section of the Royal Society of Medicine on February 8th.