CANCER OF THE OESOPHAGUS.

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Malignant disease of the œsophagus is almost always carcinoma ; sarcoma does occur, but it is exceedingly rare and it will not be considered. Much ingenuity has been and is being expended in the search for a cure of this distressing complaint, which had, until recently, at any rate, rightly laid claim to a mortality of very nearly 100 per cent.

More than half the patients complaining of œsophageal symptoms are found to be suffering from œsophageal carcinoma and many more than half in the older age groups. Carcinoma of the œsophagus is generally considered to comprise about 5 per cent. of all malignant disease.

Etiology.

Like all neoplasms of the alimentary canal, men are much more commonly affected than women—at least 80 per cent. of cases being in men. Chronic irritations of the œsophageal mucosa by alcohol, tobacco, very hot foods and drinks and by dental sepsis have been regarded as causative agents. Syphilis does not seem to play a part.

Growths tend to appear at levels in the œsophagus where is some anatomical narrowing—at the upper end, at the levels of the aortic and left bronchial crossings and the diaphragmatic constriction.

Carcinoma of the œsophagus has been observed to follow peptic ulcers, cardiospasm, diverticulum, cicatricial strictures, and it has occasionally occurred in cases of congenital short œsophagus.

In women post-cricoid carcinoma is fairly common. The Plummer-Vinson syndrome certainly predisposes to disease in this situation. Such growths are not in the œsophagus but in the hypo-pharynx, and will not be considered here.

Pathology.

Three types of growth are found. Most common is (1) a typical *epitheliomatous ulcer* with a raised everted edge ; (2) a *fungating mass* projecting from a wide base into the lumen ; (3) a *hard scirrhus annular type* which ulcerates through the mucous membrane in later stages.

Occasionally carcinoma of another organ extends into the œsophagus—from the thyroid gland, the larynx, trachea or bronchus, or upwards from the stomach. Most cases are found to be squamous-celled without much cell nest formation or much keratinization. Columnar-celled growths arise from glands in the œsophageal wall or from the isolated patches of gastric mucosa which occur there. Other varieties have been described.

Situation.

Most growths occur in the middle part of the gullet, fewer in the lower part, and still fewer in its upper part (post-cricoid neoplasms are excluded). Various sets of figures give varying percentages to each situation ; one of the reasons for this no doubt being that the length of œsophagus involved makes classification difficult.

Spread.

The growth spreads round the œsophageal wall and also longitudinally, so that many growths are found several inches in length. The various layers of the wall are successively involved until, eventually, if the patient lives long enough, surrounding structures are invaded.

In untreated cases metastases in the lymphatic glands are less common than might be expected ; they are seen in about half the cases. Now that the various treatments used tend to prolong life, such gland involvement is more frequently seen. The supra-clavicular glands on both sides may be affected, as may be the glands round the left gastric artery and in the lesser omentum.

Symptoms.

The main symptom is difficulty in swallowing. This unfortunately appears only after the disease has been present for some considerable time. A well-marked carcinoma of the œsophagus has been observed by X-ray examination with an opaque meal in a man used for demonstration and who complained of no symptoms at all. Sometimes the onset of dysphagia is sudden, owing to the blocking of the stricture by a pill or some hard food. More often there is slight and, at first, perhaps, transient difficulty with solid foods. Later semi-solids and, finally, liquids are swallowed with difficulty.

According to Chevalier Jackson (1929), dysphagia "may be absent or not noted by the patient during the first year or more in the development of cancer of the œsophagus. A slight, vague sense of something not being just right in the swallowing function may be present for a long time prior to actual difficulty in getting food down. Suddenly some day the patient finds that food has lodged. After a time, possibly with the aid of swallowed water, it goes down, and the patient may notice no more trouble for many days or even months." Chevalier Jackson also points out that any well-chewed solid food can be swallowed through a lumen 5 mm. in diameter (1934).

Occasionally there is a feeling of weight or fullness behind the sternum. Sometimes the earliest complaint is of dyspepsia or flatulence. Hoarseness due to involvement of one of the recurrent laryngeal nerves, usually the left, may be the first symptom noticed.

Later there will be excess of saliva, possibly with blood-stained expectoration. There may be bouts of coughing due to overflow into the larynx of food or saliva. Regurgitation is uncommon until late. Pain is a late symptom and usually indicates extension of the growth beyond the œsophagus to involve the mediastinum, the vertebral column or the intercostal nerves. Loss of weight is continuous and rather rapid, but cachexia is seen only in the later stages.

Death may result from inanition and cachexia, but may come more quickly from mediastinitis, broncho-pneumonia or hæmorrhage from a large vessel. A fistula into the left bronchus or the trachea leading to broncho-pneumonia is not uncommon.

Examination.

From the fit of the patient's clothes or collar loss of weight may often be inferred even when no history of it is given. Laryngeal examination may disclose a collection of frothy saliva in one or both pyriform fossæ—a valuable sign of œsophageal obstruction. Paralysis, complete or incomplete, of one or occasionally of both vocal cords may be noted, indicating involvement by a growth in the upper part of the œsophagus of one or both recurrent laryngeal nerves.

Sometimes enlarged glands are found in the neck, and occasionally, with a growth of the cervical œsophagus, there is a diffuse swelling pressing forward the trachea. Rarely with a growth low down in the gullet a solitary enlarged gland is found in one or other supraclavicular region.

X-ray examination of the chest and œsophagus should be carried out. With the screen the passage of the opaque meal, which should not be too thin, can be followed. A picture taken with the patient in the Trendelenburg position, just after swallowing the opaque meal, will show the lower limit of the stricture and will define its length. A very thick and heavy opaque meal will often show the length of the stricture, even in the upright position. It is of great importance that such information should be available if radiation therapy or surgical treatment is contemplated.

The radiological appearances of a carcinomatous stricture are characteristic and, for practical purposes, diagnostic. During deglutition the opaque matter is seen to stop suddenly at the level of the upper end of the stricture and further mouthfuls accumulate in the slightly dilated œsophagus above while a little trickles through the narrow and irregular stricture. In an early case with a thin opaque meal little beyond a narrowing of the lumen may be noticed; rarely in cases without stenosis a little opaque material may be held up at the site of the early lesion.

Oesophagoscopy examination will disclose one of the three types of lesion found. There will be little difficulty in recognising the fungating type or the epitheliomatous ulcer; these growths bleed readily and freely when touched. Where the oesophageal wall is infiltrated in the thorax the normal movements of the oesophagus with respiration will be absent. With the annular type the stenosis can be seen and, with the oesophagoscope or with long forceps, the hardness of the smooth infiltrated and immobile walls can be made out. The degree of stenosis can be determined by the passage of bougies, and one of Jackson's bougies of appropriate size passed right through the stricture and then withdrawn will give a measure of its length.

A small piece of tissue should be removed for microscopical examination. The distance of the upper end of the stricture from the upper incisor teeth (or the upper alveolus in the edentulous) should be carefully noted.

Treatment.

The unfortunate fact is that far too many cases are diagnosed too late for treatment to be anything but alleviative. The difficulty of early diagnosis remains to be overcome. However, the prospect of cure by radiological or radical surgical measures in view of modern improvements in technique is, at any rate, not so dark as it was in the past. Chevalier Jackson suggests that more success will be attained when patients with vague oesophageal symptoms are given the benefit of early oesophagoscopy study. Abel (1929) would rather say that "the *disease* is so fatal that, in the absence of any contraindication, such as metastases or extreme emaciation, radical removal should always be attempted" than that "the *operation* is so fatal as not to be worth attempting."

During any treatment it is important that attention be paid to diet and enough suitable and carefully sieved food must be given.

Gastrostomy is not now done so often as in former days and by various means patients are often enabled to swallow reasonably comfortably until the end. Gastrostomy done early will, of course, enable sufficient nourishment to be given to the patient for a long time, but if it is postponed until the general condition is poor in about half of all cases the patient does not leave hospital alive.

Better than gastrostomy is **intubation**. Souttar's tubes of varying size may be introduced into the stricture through an oesophagoscope. With care the risks of the procedure are not great. After dilatation of the stricture the selected tube of coiled German-silver wire is placed on its appropriate introducer and carried on a guide introduced through the stricture into position. Frequently such tubes are retained in position and the patient swallows practically normally for many months. If the tube passes down into the abdomen or is pushed above the stricture another must be introduced. The great advantage of such intubation over gastrostomy is that the normal processes of mastication and deglutition go on. Even with a gastrostomy present it is sometimes worth intubating, as this obviates the inability of the patient to swallow the saliva and discharges from the growth which accumulate in the oesophagus.

Diathermy to re-establish an adequate lumen and endoscopic removal of the growth have been given up.

Nowadays the majority of cases receive some form of radiation therapy. The results as regards alleviation are on the whole satisfactory and occasionally apparent cures result.

Deep X-ray therapy often gives relief and in certain cases cure seems to result. At first it was found that many cases succumbed as a result of damage to the lungs, but now, by using long strip fields, in the middle line anteriorly and posteriorly and just to either side of it, it is found possible to avoid lung damage. It is necessary to localise the lesion accurately; both its level and extent and its exact position in the thorax can be found and the X-ray tube can be so directed that the exact dosage reaching it can be calculated. A course of treatment extends over four, five or six weeks. Sometimes great disappointments are met with, but usually the difficulty in swallowing fairly soon diminishes and in some cases no return of the growth is found.

The *introduction of radon seeds* had and still has its advocates. Repeated applications through the œsophagoscope are necessary. At the first application only the upper part of the stricture can be dealt with. Later the lower parts can be reached. Alleviation results in most cases. The introduction of radon seeds by open operation through the chest has been given up.

Radium (Cade, 1940). By various methods radium has been used in the treatment of œsophageal cancer for a number of years. Results in most hands have been disappointing, alleviation only resulting. Guisez, whose results have not really been bettered, prepares a stomach tube containing tubes of radium totalling from 20 to 80 mgm. screened by 1.5 mm. of platinum. The radium is so distributed that when the tube is in position the whole length of the stricture will receive the radiation. On account of the possible shift in the position of the tube it is necessary for the radium to occupy rather more than the measured length of the stricture. By doing this, any extension of the growth upwards or downwards not visible to the naked eye is dealt with. The radium is introduced for five or six hours on twelve to fourteen occasions in the course of fifteen to twenty days.

Guisez reported on 270 cases. He estimated that life was prolonged by from three to sixteen months, while thirty patients survived eighteen months or more, and of these four died of intercurrent diseases without showing any return of œsophageal symptoms. In eleven cases of proved carcinomata of the œsophagus there was no recurrence after three to eleven years. Of the lasting cures four patients were alive and well fifteen years after treatment (Cade, 1940).

It is important that expert advice be obtained as to the correct dosage of radium treatment to be given.

Deep X-ray therapy and Radium treatment combined. At the present time the combination of these two methods is being tried and possibly it will offer more hopes of success. A course of deep X-ray therapy is given, as has been described, to bring about regression of most of the tumour. After this a stomach tube loaded with radium is introduced for a number of hours on several occasions and at suitable intervals.

Radical Operation.

Constant endeavours are being made to secure satisfactory results by radical removal, and slowly but surely it would seem that advances are being made. Recent improvements in the anæsthesia for chest operations have helped considerably. One of the difficulties has been the difficulty of approach, but this has been largely overcome. The œsophagus with no serous coat and relatively not well supplied with blood is not good tissue to work with. As Grey Turner (1936) has pointed out, while the œsophageal tube is "extraordinarily distensible it is not extensible to any extent" and the muscular wall tears easily. Shock and mediastinal infection and later chest complications have accounted for many deaths.

Ochsner and De Bakey (1941), in an extensive review of the various operations performed, divide them into (1) thoracico-cervical, (2) thoracico-abdominal, (3) thoracic, (4) abdominal, and (5) abdomino-cervical. From their review of many published cases and from their own experiences, the two types of operation which are generally indicated for carcinoma of the œsophagus are the one-stage thoracico-cervical and the two-stage thoracico-abdominal. There has been controversy about the trans-pleural and extra-pleural approach. Ochsner and De Bakey consider that the trans-pleural route offers much easier access and permits of better surgery. Growths in the upper part of the chest are best approached from the right side and those in the lower part from the left side.

After a preliminary gastrostomy the thoracico-cervical technique consists of opening the chest and mobilising the œsophagus, which is then divided well below the growth, the lower segment of the œsophagus then being closed, the upper containing the tumour is manipulated upwards and out through a cervical incision.

The two-stage thoracico-abdominal operation consists first of a laparotomy with mobilisation of the stomach and division of the left gastric and gastro-epiploic arteries. A gastrostomy or jejunostomy is performed. About a week later the left side of the chest is opened and the œsophagus mobilised. By incising the diaphragm the œsophageal hiatus is

enlarged sufficiently for the stomach to be brought into the thoracic cavity. After removal of the affected segment of the oesophagus and adjacent part of the stomach an anastomosis is made protected by a piece of omentum.

For carcinoma of the cervical oesophagus, Trotter's operation or some modification of it may be used. The whole oesophagus has been successfully removed by Grey Turner (1936) by the cervico-abdominal method. When the patient died nineteen months later of intercurrent disease a small implantation carcinoma was found in the stomach.

Prognosis.

In spite of all treatment this is still extremely bad. In untreated cases it varies from a few months to eighteen months or so and death takes place from inanition, pulmonary complications, hæmorrhage or mediastinal infection. Life is certainly prolonged in many cases by radiation treatment, but it is only the occasional case that seems to be cured. With earlier diagnosis and with improved methods of treatment, both radiotherapeutic and operative, it is to be hoped that improvement in the prognosis of this dire disease will be experienced.

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