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The Clandestine Cancer

Carcinoma of the Oesophagus

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In this country there is one of the highest incidences of Oesophageal Carcinoma in the world. I have recently completed a survey of the results of management of Oesophageal Carcinoma over four years at Livingstone Hospital up to the end of 1967. 523 cases were treated personally. Most of our cases come from the Transkei and it is very interesting that it should be concentrated in this way in this area. It is this extraordinary high incidence that has stimulated the necessity and desire to investigate etiology from the point of view of epidemiology, geology and social habits.

We at the Livingstone Hospital have established a liaison with Bantu Cancer Registry in East London, who are studying these aspects. We undertake a diagnostic clinic twice monthly, at Butterworth, which is our contribution to this research project. A number of very interesting facts have emerged from this work. We have found that this is in fact a slow-growing Carcinoma. This may seem rather contradictory when one considers that the disease in South Africa is 100 per cent fatal. Here we have in early stages a relatively innocuous Carincoma which is so relentlessly lethal. Why? We have been preoccupied with this challenge continuously, but are still a long way from having answered it. Nevertheless considerable progress has been achieved. It is this knowledge, which I cannot discuss today, which has guided our policy of management, which is the subject on which I shall speak.

Evidence for my earlier remarks on slowness of growth may be seen in the following case: A patient presented in 1957, was examined by Barium Meal and passed as normal. He returned in 1959 when Barium Swallow showed a moderate defect in the oesophagus. He was still able to swallow fairly well and declined treatment. Two years later he was back again with dysphagia. Radiologically there was still a very adequate lumen to the oesophagus but the defect having extended somewhat. He refused treatment again. Two years later he came back for another Barium Swallow

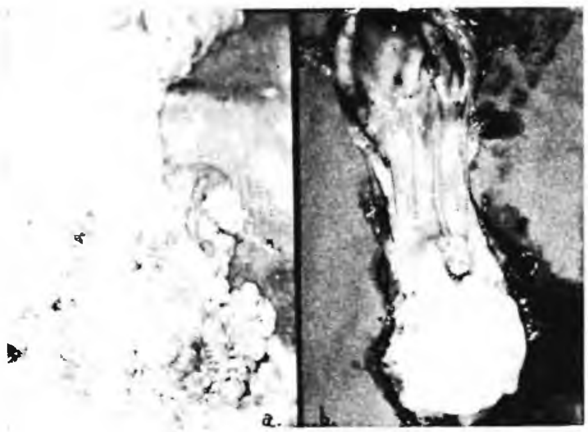

Fig. 1. Two operative specimens.

(*a*) A malignant ulcer of the oesophagus measuring 7 mm. in diameter. This is one of the smallest and earliest carcinomas encountered at the Livingstone Hospital.

(*b*) An advanced carcinoma with almost complete destruction of a long length of oesophagus.

showing an almost complete obstruction. By this time he had numerous pulmonary metastases, and was beyond treatment. It took five years to reach that particular stage. In a slow-growing tumour like this, obviously there is a process which is underway for a number of years without the patient being aware of it in any way whatsoever. The first symptom obviously, is difficulty in swallowing solid food particles. This dysphagia is accompanied later by the difficulty in managing the patient's own secretions, and the inability to swallow fluids adequately.

This progresses to an almost complete obstruction and by this time they cannot manage anything. Food and fluids accumulate in the proximal oesophagus, and spills over into the respiratory tract. This is where the importance of physiotherapy to the respiratory system becomes paramount. These examples (Figs.) illustrate the extent and ravages of this disease:

The tumour may start as a small ulcer, no more than several millimeters in diameter which is the earliest growth seen at the Livingstone Hospital (Fig. 1a). This in Japan would be regarded as a very advanced lesion. The ulcer is small but is surrounded by submucous extension which may have progressed to quite a considerable extent. The cancer progresses to a larger ulcer with deeper excavation in the centre. This excavation extends into the mediastinum beyond the oesophagus. At this stage, this tumour can be almost entirely silent; silent, sinister and quite ruthless. The ulcer extends around the wall of the oesophagus, becoming circumferential and one can imagine now how difficult it is to swallow anything but the thinnest of liquid in that narrow passage (Fig. 1b). Large tumours, more fungating than ulcerating may retrain a suprisingly large lumen in the oesophagus (Fig. 1c). These carcinomas frequently behave like an iceberg. We see so much in the oesophagus itself while there is another 4 or 5 times this size beyond this structure, in the mediastinum (Fig. 2).

Fig. 2. Late oesophageal carcinoma with extension into the lungs.

(*a*) Lateral X-ray of the chest demonstrating a large lung abscess caused by the fistula seen in (*b*).

(*b*) The growth with complete destruction of the oesophagus with a probe demonstrating a large fistula.

The oesophagus may become entirely destroyed by the carcinoma, which replaces it completely, extending beyond into the mediastinum, lymph glands, pericardium, lung and bronchi and all other structures in the mediastinum except the aorta (Figs. 3 and 4). Distant metastases to brain and skull have been seen, but are rare. Liver secondaries are more common, but nevertheless not frequently seen. Having evidence of the viscious advances on the body made by this cancer, it becomes clear why it is so important to palliate them in some way or another. How do we manage such a

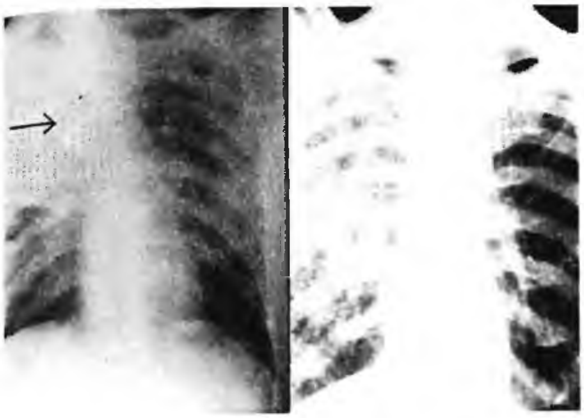

Fig. 3. X-rays of the chest of a patient with an oesophago-mediastinal fistula.

(*a*) Barium Meal demonstrates the fistula.

(*b*) The mediastinal abscess resulting from this fistula.

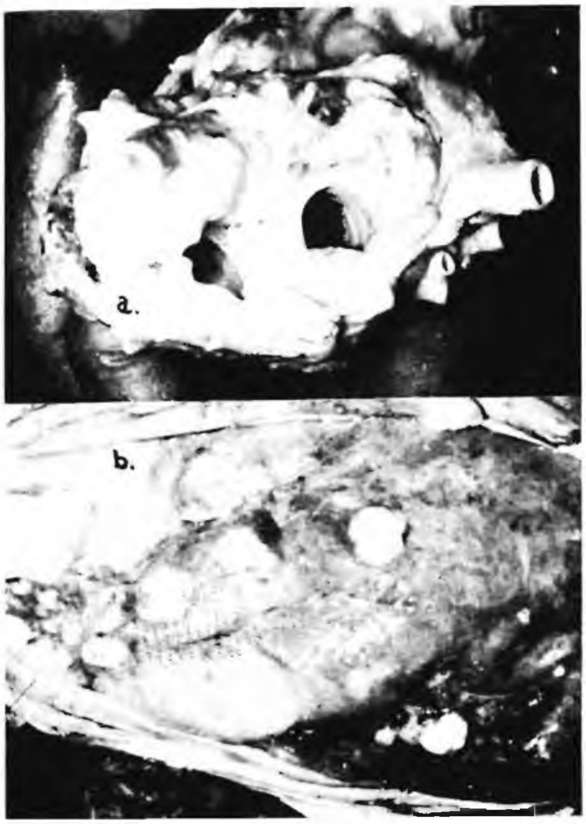

Fig. 4. Mediastinal invasion by the aquamous carcinoma.

(*a*) The trachea, aorta and great vessels of the neck completely encased in the growth.

(*b*) The heart studded with metastatic deposits of squamous carcinoma originating in the oesophagus.

malignancy, particularly when it is so far advanced? There are a number of measures available to us, viz. surgery, radiotherapy or simply as a final resort, by intubation. We aim to abbreviate treatment as much as possible because they do not have very long to live any way. The aim is to get them in and out of hospital, as quickly as possible, back to their families, enjoying above all, complete gastronomic normality.

Our policy in the last four years has always been to resect the tumour where possible. This has been subject to criticism which on superficial appraisal is possibly justified. What purpose is there in attacking with a major operation lasting 3-6 hours, a tumour which inevitably will kill the patient in several months after surgery? The answer is provided by the patient, who is the final arbiter. Swallowing is restored to normal and full diet is enjoyed until death. Only major surgery has achieved this in our series, while lesser degrees of palliation are achieved by more conservative measures. Our intention is to resect all cases where possible. However, we find that only one in five come to resection. The others are far too advanced or they have severe pulmonary complications precluding attempts at any kind of major surgery. We are not disturbed by the extent of the growth locally, or whether the trachea or a bronchus may be involved, provided there is no direct fistula (Fig. 5). We may excise a cuff of the bronchus and repair it, or lung or pericardium, in resecting the tumour, depending on the structures invaded.

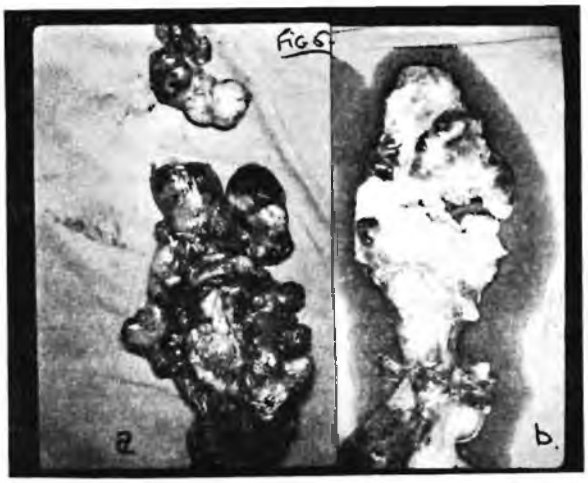

Fig. 5. Two operative specimens.

(*a*) Showing mediastinal glands and segment of lung removed with the tumour.

(*b*) Mediastinal and subcardinal glands removed with the tumour.

Oesophagogastrectomy is done in a single stage. The operation itself was first devised by Lewis in 1946. At the Livingstone Hospital a few modifications of this operation have been devised e.g., the technique of anastomosis after bringing the stomach up from the abdomen. About half the stomach is resected, reconstituting the lesser curve, and continuity is restored by anastomosis between the stomach and the oesophagus. This has been the great failure of the operation which has not been popular because of the high operative mortality. This operative mortality has been caused largely by leakage at the anastomosis. By means of an "inkwell" anastomosis (Figs. 5 & 6) devised at Livingstone Hospital, this complication no longer exists. However, being a major operation, other major complications may arise. There is a mortality rate, as seen in Table II. We have now reduced this from 20 per cent to 12 per cent in 1967/68, in the last 48 cases. This compares favourably with other figures elsewhere. The average mortality rate in literature from the United States, England and the Continent is about 20 to 25 per cent. In Japan they claim about 14 per cent operative mortality with one stage oesophago-gastrectomy. Where this reduction has been achieved, and

Fig. 6. A diagrammatic representation of the "inkwell" anastomosis.

I say this in complete sincerity, is the recognition of the extreme importance of, pre-operative and post-operative care. Not only the patient's nutrition, which is usually poor, is of importance. We usually manage to get the patient to put on a few pounds in weight during his stay in hospital. Most important of all is intensive care to the respiratory system before and after operation. Postural drainage, intensive respiratory physiotherapy is mandatory, if these patients are to survive a major onslaught such as we inflict. The patients require intensive education, being taught how to breathe and breathe adequately, and they also have to be taught how to cough productively. The patient is inclined to imitate a cough without actually producing it. They have to be taught how to do it effectively. When this essential requirement is fully recognised, operative mortality from respiratory complications will be reduced to a minimum. Fig. 7 shows a group of post-operative patients, indicating abdominal and thoracic incisions. Their pleasure at being able to eat and enjoy once more, a full diet, is evident on their faces.

If we are not able to perform an *oesophago-gastrectomy*, we have to be able to offer something else. In my experience I have not yet encountered anything as miserable and more distressing than to see a patient dying of an untreated Oesophageal Carcinoma. Something has to be done for them, if only temporarily. When they are not fit for a thoracotomy the next procedure available is an *oesophagocolic by-pass*. A segment of colon is isolated and placed between the cervical oesophagus and stomach. The ascending colon and perhaps terminal ileum were used initially. This is isolated from the gastro-intestinal tract. Continuity is re-established by rejoining the proximal ileum and colon. The isolated segment is transplanted on a vascular pedical using the middle colic artery, which remains intact. This colon was brought up antesternally, i.e. subcutaneously.

Fig. 7. A group of patients convalescing immediately after oesophago-gastrectomy.

The colon or terminal ileum is then anastomosed to the oesophagus in the neck and to the stomach in the abdomen. Our results with this were disastrous—other workers claiming satisfactory results. The reason for this failure we attributed to the fact that the colon could not maintain the blood supply satisfactorily and the colon sloughed in about half the cases. This resulted in a mortality rate of some 44 per cent (Table III) largely due to sloughing of the colon which had been transplanted.

However, among those who survived there was an average survival of 15 months. In those who had post-operative radio-therapy, the average survival was 11.4 months. With the type of radiotherapy which we have at our disposal it is not surprising that a number of patients die somewhat earlier, from radiation pneumonitis. No matter how expert the radiotherapy was, radiation pneumonitis may win. I think this will account then for the slightly lower average survival of those who have post-operative radiotherapy. Nevertheless, this survival time is better than that for oesophago-gastrectomy. The reason may be that during a resection of the tumour the cancer cells are disturbed by handling the tumour, disseminating them throughout the body.

In this series, the number of survivors was obviously considerably smaller and must be regarded with a certain amount of reserve. Eight patients died in hospital without radiotherapy. With pre-operative radiotherapy there were no survivors. Among the survivors of the bypass operation, we were struck by the minimal disturbance to the patients post-operatively. We are also impressed by the fact that there are relatively long-term survivors. It was felt therefore, that this is obviously an operation which has some merit. We have now devised a new variation to the operation. The middle colon is used with a better blood supply from the left or middle colic vessels. The colon is placed behind the sternum, which is a shorter distance. The new innovation is a vascular anastomosis in the neck to augment the blood supply from the vascular pedicles. The right colic artery and veins are used. The technique of anastomosis is that of Nakayama of Japan. The instrument used for the anastomosis between small vessels is called "Nakayama Small Vessel Anastomosis Clamp". This operation is a great advance on the previous technique.

There are at present 10 such patients and surviving very satisfactorily. In no case has the colon been lost. It is felt that some progress in this respect has been made. There are some cases where the growth is too high above the aortic arch and in the neck to permit this operation. Other cases are not fit for major surgery. These patients are treated by radiotherapy. As I have said, we have a rather primitive means of radiotherapy here. Nevertheless radiotherapy is extremely effective for a limited time. Here again because of the risk of damage to lungs, these patients, too, depend very much for their existence on being able to breathe and to cough and to expectorate adequately, and keep their lungs clear and functioning. Radiotherapy is a means of

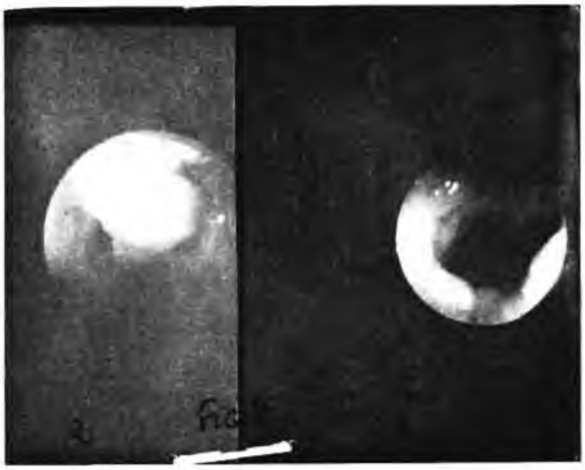

Fig. 8. Oesophagoscopy.
(*a*) Looking down the oesophagoscope at the tumour before Radiotherapy.
(*b*) The same oesophagus after Radiotherapy and dilatation.

Fig. 9. The risks of endo-oesophageal intubation.
(*a*) Perforation of the oesophagus at the proximal end of the Celestine Tube.
(*b*) Perforation of the stomach at the distal end of the tube.

management which in itself can produce mortality by virtue of damage to the lungs. The patient has to be relatively fit to be able to stand this form of treatment which takes about five weeks to complete. In selected cases as described, radiotherapy is the treatment of choice. The tumour is shrunk, and oesophageal dilatation after completion of the therapy enables the patient to take a normal diet for several months (Fig. 8). Table IV indicates the results achieved by this form of treatment.

There seems little point in subjecting a patient to this protracted form of management when the expectation of life is no longer than about 8 to 12 weeks, i.e. in the terminal case. Thus the final resort is permanent endo-oesophageal intubation. Results with intubation have been worst of all. The original operation took about 45 minutes to perform, requiring laparaotomy and gastrotomy, as well as oesophagoscopy. The patient is able to be discharged 1 to 2 weeks after operation. They are able to to swallow fluids and little else. Of 162 patients (Table V) half of them were treated because they were so advanced that this was the only form of management possible. The other 80 received this method of management preferentially for various reasons. There were circumstances from time to time which precluded surgery and it was not because of the fitness of the patient. Thus half of them had preferential treatment by intubation and the other were terminal. Interestingly enough, both of these halves show identical survival, after intubation, of no more than three months, whether they were fit or terminal. There had to be a reason for this. It became evident on studying autopsies of patients who died at widely varying intervals after intubation. As many as 56 died in hospital; the operative mortality was 34 per cent. It would be unfair to criticise the procedure because of this operative mortality, as half of the patients were terminal. This would increase the

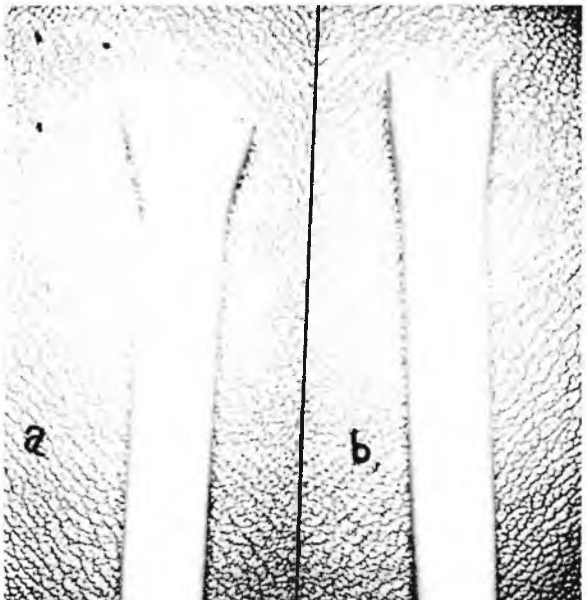

Fig. 10. The new Livingstone Hospital tube.
(*a*) Anterior view. (*b*) Lateral view.

operative mortality, but the short survival requires explanation.

In 27 autopsies on patients who have died after the tube had been inserted, 22 of them died as result of the tube, which was actually the instrument of death. In only five was the cause of death due to metastases or respiratory complications. The tube causes perforation of the oesophagus or stomach either end (Fig. 9). This tube, designed by Celestin, is made of fairly rigid plastic material. It extends from just above the growth, down into the stomach, requiring an abdominal operation. A new tube has been devised at Livingstone Hospital, which is inserted by oesophagoscopy alone. The design is such that the risk of perforation of oesophagus is reduced considerably, and perforation of the stomach is obviated altogether (Fig. 10). Results with tube have so far, been very satisfactory.

Such is the somewhat dismal report on the management of oesophageal carcinoma, which I have described as an incurable cancer, in the population served by Livingstone Hospital.

Notwithstanding this, we may derive considerable encouragement from a comparative analysis of results if all cases are divided into an early and a late half (Table VI).

The early series consists of 273 cases treated from 1964-66, and the latter series, 250 cases treated in 1966-67. In the latter hospital mortality (27.2 per cent) is appreciably lower than in the former (39.1 per cent). This is accounted for by a number of factors.

1. Fewer refuse treatment (Table VI).

2. The patients are presenting somewhat earlier (albeit by no means early enough), as evidenced by the smaller numbers who die before treatment is even started. This displays an increasing trust in hospital treatment and emphasises the value of the diagnostic clinic in Butterworth.

3. The operative mortality from oesophagogastrectomy is more than halved, from 23.5 per cent in the early period, to less than 11 per cent. Table VI indicates an operative mortality of 16 per cent in those who did not have pre-operative radiotherapy in 1966-67. During the period 1967-68, subsequent to cessation of pre-operative radiotherapy, the operative mortality is less than 11 per cent in 48 operations.

This considerable reduction has not been achieved so much by improved operative technique. One is probably as clumsy now as ever, although operating time has been reduced by an hour or more. The principal and most important factor has been the increasing awareness of the necessity and value of pre- and immediate post-operative physiotherapy of an intensive quality. Ward staff maintains a vigorous regime in this respect, after instruction by our physiotherapists, Misses Hobson, Blenkinsop and Javal.

The alteration in mortality rates with the individual treatments, has not altered tremendously. But if we take a combination of patients treated by radiotherapy and intubation together in the 1st and 2nd periods, the figures are almost exactly inversely proportional. In the early period the ratio was 30 to 135, while in the later period the ratio was 137 to 27, making totals of 165 with 51 deaths, and 164 with 33 detahs respectively. This reduction in mortality rate of combined methods of therapy is considerable. Thus where radiotherapy is the preferential therapy (of these two methods), the mortality is considerably lower. Yet in the individual methods of treatment there is not a very significant lowering of mortality. With better means of therapy we may improve on this even further.

A new trial has been commenced where we are combining radiotherapy with chemotherapy which is now becoming a popular means of combating cancer. The drug we use is Methotrexate. So far we have had encouraging results from radio-sensitization with chemotherapy and then subjecting the tumour to radiotherapy. With this we hope that our mortality will be lower and more important—this therapy should be more effective. The Provincial Administration has encouraged us in this project and has given us an adequate amount of equipment, both here in Livingstone Hospital and at the little hospital in the Transkei, at Butterworth. Thus we can make a more accurate early diagnosis which may ultimately unmask this clandestine cancer.

Our thanks go to the Hospital Administration authorities in Cape Town for this recognition and assistance.

TABLE I

Summary of Results over the Total Four-year Period.

CARCINOMA OF OESOPHAGUS 1964-1967
LIVINGSTONE HOSPITAL, PORT ELIZABETH

Died in Hospital		Died at Home	Longest Survivor (Months)	Average Survival (Months)	Still Alive	Lost to Follow-up	Total
After or during Treatment	Before Specific Treatment						
117 (22.4%)	54 (10.3%)	(45.5%)	36	8.4	28	86 (14.6%)	523
171 (32.7%)							

TABLE II

Summary of Results from Oesophagogastrectomy 1964-1967

OESOPHAGO-GASTRECTOMY

	Died in Hospital	Longest Survivor (Months)	Average Survival (Months)	Still Alive	Lost to Follow-up	Total
Alone	18 20.2%	24	8.6	6	13	51
With Post-operative Radiotherapy Radiotherapy only		36	9.4	5	4	38
With Pre-operative Radiotherapy	8 44.4%	12	6.5	4	3	18
Total	26 24.3%	36	8.2	15	20	107

TABLE III

Summary of Results from Oesophagocolic Bypass 1964-1967

OESOPHAGO-COLIC BY-PASS

	Died in Hospital	Longest Survivor (Months)	Average Survival (Months)	Still Alive	Lost to Follow-up	Total
Alone	8	24	15	0	1	11
With Post-operative Radiotherapy	0	24	11.4	2	1	8
With Pre-operative Radiotherapy	2	—	—	—	—	2
Total	10	24	13.2	2	2	21

TABLE IV

Summary of Results from Radiotherapy 1964-1967, Excluding Pre- and Post-operative Radiotherapy

RADIOTHERAPY

	Died in Hospital	Longest Survivor (Months)	Average Survival (Months)	Still Alive	Lost to Follow-up	Total
Alone	16	18	6.9	10	23	129
With Tube	4	12	3.8	0	3	16
With Gastrostomy	5	12	5.5	1	4	22
Total	25	18	5.4	11	30	167

TABLE V

Summary of Results from Intubation 1964-1967

INTUBATION

	Died in Hospital	Longest Survivor (Months)	Average Survival (Months)	Still Alive	Lost to Follow-up	Total
Overall	56	30	3	0	34	262

TABLE VI

Results in Comparison between Two Consecutive Periods 1964-1966 and 1966-1967

Year	Refused Treatment	Died Before Treatment		Oesophago-Gastrectomy	Oesophago-Colic By-pass	Radiotherapy	Intubation	Total
1964 to 1966	18 6.6%	37 13.9%	Total	51	13	30	135	273
			Died in Hospital	12 23.5%	6 46.6%	5 16.6%	46 34.1%	106 39.1%
1966 to 1967	10 4%	17 6.8%	Total	56 *38 †18	8	137	27	250
			Died in Hospital	14 *6 †8 25% *16% †44%	4 50%	20 14.6%	13 48.1%	68 27.2%

*Without Pre-operative Radiotherapy. †With Pre-operative Radiotherapy.