

Among those having bypass procedures only, the average survival time was 16.6 months. Except for one patient who had congenital tracheoesophageal fistula and one with stenosing esophagitis, all bypasses were done as palliative procedures for carcinoma.

Among the 29 patients who had resections for carcinoma of the esophagus, 11 (38%) survive for an average of 6.7 years ranging from 28 to 125 months. The average survival time for all of the 29 patients is 38.6 months. All received preoperative x-radiation therapy. The technic of single-stage total thoracic esophagectomy and esophagocoloplasty conducted via abdominal, right chest and right neck incisions is briefly described.

Among those with carcinoma of the stomach, none survive. The average survival time for the group is 12.2 months.

Among the 12 patients with benign lesions, all survived for an average of 57 months. Following operation, one died at 6 months from hepatic failure and another at 2 years from trauma.

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DISCUSSION

DR. ROLLIN A. DANIEL, JR. (Nashville): Dr. Gregorie very kindly allowed me to read his paper and I am sure that I can recommend it to you at the time of its publication. It is extremely thorough, and as you can gather from Dr. Gregorie's presentation, an extremely critical analysis of his work in a very difficult field.

I can not find anything to criticize in Dr. Gregorie's paper and certainly not in his presentation of his work. I can only be complimentary of his efforts in the field of esophageal replacement technics.

The mortality rate, for example—9 per cent in 55 colon transplants—is better than my mortality rate in attempting esophageal replacement by any means, and I think, probably better than the majority of people who have attempted to treat these diseases.

We are indebted, again, to Dr. Gregorie and to Dr. Parker for their continued efforts in the management of serious and debilitating diseases. These diseases include not only carcinoma, but the benign esophageal lesions which Dr. Gregorie has alluded to.

I was interested, in reading Dr. Gregorie's paper,

in his management of a number of postoperative complications. For example, two patients with carcinoma of the cervical esophagus had received about 6000 rads of high voltage radiation therapy before operation and each of these developed minimal leakage from the colo-esophageal suture lines, which closed spontaneously. Healing might be expected to be retarded following this amount of irradiation.

I believe the improvement in survival of patients with carcinoma which has been reported by Dr. Gregorie and Dr. Parker is due to two factors: first, the experience and skill of the operating surgeons and second, the use of preoperative radiation therapy.

I would like to ask Dr. Gregorie whether he does agree that, aside from his own efforts, which I again would like to praise, the administration of radiation before operation, which has been practiced for several years, has contributed to improvement in survival rates.

DR. RAYMOND W. POSTLETHWAIT (Durham): Discussing Paper No. 14: Dr. Vansant has presented an excellent, concise, and eminently practical discussion of the lower esophageal ring, and we certainly have no major area of disagreement.

His interesting correlation of the size of the ring with the symptomatology deserves emphasis. You will recall that in Schatzki's large series of patients only four had difficulty swallowing when the diameter of the ring was greater than 20 mm. Perhaps from the standpoint of the ring only, we might ignore those in the 21 to 25 mm group. Schatzki found, however, that about one-third of these patients definitely showed a decrease in diameter of the ring, and some of these became symptomatic. Our experience has been similar.

I agree that the ring is at the esophagogastric junction, in that the mucosal change is characteristically at the edge of the ring. Grossly, however, the ring is usually a centimeter or more above the junction of the tubular esophagus with the sacular stomach. This is probably of minor significance, as well of these patients have had hiatal hernias in our experience.

Dr. Vansant does not believe direct operation of the ring is necessary, and generally this is true. In the occasional patient, however, excess fibrous tissue deposition in the submucosa makes dilatation difficult or impossible. In this situation two or three wedges of tissue might be removed from the ring. The sphincter competence is restored by appropriate hernia repair. The ring should not recur.

I, too, would like to add my congratulations to Dr. Gregorie on a very remarkable paper. When you realize that in the reported series in the world literature the postoperative mortality rate in the cases of malignancy is 25 to 30 per cent, and with benign lesions from 7 to 10 per cent, I think this point alone demonstrates the excellence of his work.

DR. WISHARD S. LORIMER, JR. (Fort Worth): Discussing Paper No. 14: Dr. McCune, Dr. Sabiston: I address my remarks to Dr. Vansant's paper about the distal esophageal ring.

We have felt for a number of years that the distal esophageal lesions—benign lesions—should be approached transabdominally. [Slide] In the case of the distal esophageal ring there are some that, as Dr. Postlethwait mentioned, will not respond to just pulling the hernia down and fixing it. They are fibrotic and have to be resected. We have used a method that I highly recommend, of inserting a Silastic catheter through an anterior gastrostomy opening in the cardia into the distal esophagus above the ring, inflating the balloon, and then pulling the esophagus down into the abdomen.

[Slide] It is very easy to mobilize the esophagus with the catheter in place, pulling it down easily into the abdominal cavity.

We agree with the thesis that was proposed by Paulson before this society several years ago, that when these rings are excised a mucosa-to-mucosa silk anastomosis should be accomplished in the resulting defect.

[Slide] This shows an 8 mm. dilator going through the reconstructed mucosa of the distal esophagus with the silk sutures in place.

This to us is the way these should be done. We formerly felt—years ago—that this operation should be done through the chest, but now we feel that all distal benign esophageal lesions should be approached transabdominally. In the case of the stricture which will not respond to gentle dilatation, the introduction of the Silastic catheter, pulling the esophagus down—also helps to mobilize it and keep the catheter in place, if you are going to do an esophageal hiatus hernia repair, until you have the diaphragm repaired posteriorly, resect the ring, repair the mucosal defect, and then close the gastrostomy.

We have had no complications and have been very pleased with the results.

DR. ROBERT MASON (Baltimore): Discussing Paper No. 15: I'd like to compliment Dr. Gregorie on his series, and in particular his mortality and success rates. I was a member of the group of Guesney *et al.*, and would like to comment a little on the matter of our results.

First of all, all the patients reported in this series of approximately 40 patients had cancer of the esophagus. Most of them received approximately 6600 rads, and some a good deal more than that. The operation performed was essentially that in approach that was described by Dr. Gregorie except that we more commonly used the stomach as the replacement, and found that it would reach the neck as well as did the colon, and saved one extra anastomosis.

The complications that were described were largely, we felt, due to the effects of the irradiation. This was felt in two ways: first of all, radia-

tion pneumonitis, and, secondly, radiation myocarditis. Radiation pneumonitis usually led us to utilize a tracheostomy tube and respirator. Inasmuch as the balloon of the tracheostomy tube then rested just anterior to our gastroesophageal anastomosis, there was a frequent incidence of tracheoanastomotic fistula.

The other problems related more directly to radiation pneumonitis, and cardiac effects of irradiation. These effects were primarily those of myocardial failure, rather than those of pulmonary embolism or some other effect related to a fibrinous exudate from the heart.

We had found that the presence of celiac metastases was associated with 100 per cent mortality from later metastatic disease, and had taken this as a contraindication to resectional therapy, and utilized only palliative irradiation in these cases.

Because of the problems related to radiation pneumonitis and myocarditis, two things have been done, one of which is to reduce the total amount of irradiation; and the second is that we have staged our reconstruction so that the radiation and resection are the initial procedure. If the patient survives this and lives for at least 6 months, then consideration is given to replacement by either antethoracic or retrosternal colon. These patients have been fewer in number, and number approximately ten now, but have shown a gratifying improvement in reduction of complications.

DR. JOHN H. VANSANT (Closing discussion of Paper No. 14): I congratulate Dr. Gregorie on a very fine review of his overwhelming surgical treatment of esophageal disease, compared to the rather conservative approach to which I alluded.

Dr. Gregorie, who performs tremendous reconstruction of the esophagus, mentioned that a conservative approach for strictures of the lower esophagus is indicated. He quoted the use of the Hill approach in repairing hiatal hernias with reversal of distal esophageal strictures.

I would like to emphasize two points. In patients with a lower esophageal ring which presents with the typical symptom of recurrent, painless, total obstruction, the ring can always be dilated easily, and it is not necessary to operate upon the ring. However, in the circumstances that Dr. Postlethwait and Dr. Lorimer mentioned, in which there is a marked stricture of the distal esophagus, you no longer simply have a symptomatic ring; you are now dealing with a new condition which has developed into a definite stricture. Just because it is a circular, ring-like stricture rather than the more traditional elongated stricture, I think means nothing. I have found that in many patients with either type of stricture which could not be dilated prior to operation, at the time of transabdominal repair the stricture could be dilated easily by having the anesthesiologist pass the bougie after the distal esophagus had been mobilized. If you can adequately dilate the stricture, all that is necessary

is to repair the hernia and the stricture will reverse itself after the reflux has been controlled.

DR. H. B. GREGORIE, JR. (Closing discussion of Paper No. 15): In regard to Dr. Mason's comment about the two-stage approach, I would say that there is not sufficient information to statistically decide this point from the case numbers presented in this report and done as a single stage. I do have the impression that there is a hint toward this; that being that in the colon bypass patients, numbering ten, who were of comparable risk status, there were two deaths. One of these probably was a preventable death, but in any case 20 per cent mortality in that stage of what otherwise would be a two-stage procedure, contrasted with the lower mortality in the single-stage procedures with resection. This is being studied in some institutions, and it will take more time for a proper answer. With two stages, patients have the bypass brought up in an antethoracic channel. The bypass has to turn about the trachea to go posteriorly to the cervical esophagus. Something is added to the mediastinum which may require resection of portions of the manubrium or clavicle to create a sufficient opening for the swallowed food to move through. If the bypass is put in direct alignment in the esophageal bed, the swallowing function is better. Such is the case in the single-stage procedure. Unquestionably, the dissection of the cervical esophagus is aided by that which can be bluntly done through the chest and upward in the single-stage procedure and the nutrient inferior thyroid vessels which supply the cervical esophagus may more often be preserved.

In regard to the two fistulae that Dr. Daniel alluded to, both of these patients had heavy x-radiation therapy to the cervical area; one, 6000 rads for a carcinoma of the larynx 17 years before he had the carcinoma of the esophagus. These were the only two cases of fistula in the series. One important aspect of this is that the structures of the neck buttress the anastomosis, and if the bypass is brought up without tension and carefully sutured the likelihood of fistula formation is reduced.

Some years ago Dr. Parker showed that the leading cause for operative mortality in esophagectomy was anastomotic leakage. If this leakage occurs in the chest, one gets empyema that these poor risk patients tolerate poorly.

Preoperative irradiation has given distinct benefit, from past study, to the patients that we have surviving. All of its precise benefits are not known. It tends to shrink the tumor. It may somehow limit the catabolic influences of the viable tumor. It frequently permits restoration of a swallowing conduit, to allow for improved nutrition prior to operation. It does not seem to make the operation more difficult, but of itself may produce other complications, such as pulmonary fibrosis, which has been troubling in some of our cases, and perhaps injury to the heart at high dose levels.