Medical Oncology

Second Edition, Revised and Expanded
Volume II

An Advanced Course

A Self-Assessment Guide
for Subspecialty
Board Examinations and Practice

Joseph G. Sinkovics

MEDICAL ONCOLOGY

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Subspecialty Board Examinations and Practice

Second Edition, Revised and Expanded
(In Two Volumes)
Volume II

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CONTENTS

15.1 CARCINOMA OF THE ESOPHAGUS

Epidemiology

The etiology is unknown but exogenous environmental factors very strongly influence the incidence of esophageal carcinoma. In the Western hemisphere the incidence is not too high ($10/10^5$); it is stable for the Caucasian male but rising for the American black male. Increased incidence is associated with male gender, smoking, and alcohol consumption (JAMA 226:1546, 1973). Incidence is the highest in Transkei, South Africa ($70/10^5$ for men, $33/10^5$ for women), northern China ($140/10^5$), Iran ($93/10^5$ for men, $110/10^5$ for women), and in Uzbekhistan, Kazakhastan, and Turkmenia ($28\text{-}51/10^5$ for men, $14\text{-}83/10^5$ for women). Incidence is low in Nigeria (Ibadan), Nicaragua, Phillippines, and among non-Jews in Israel (Cancer 40: 1879, 1977). In the Sudan the incidence is not increased but there is a preponderance of women and patients of younger age groups (Cancer 37:2533, 1976). Thus, there appears to be an Asian esophageal cancer belt extending from northern China through central Asia to the southern shores of the Caspian Sea. Neither smoking nor excessive alcohol intake explains its high incidence in northern Iran (Gonbad), where women are afflicted more than men (Science 175:846, 1972). Even in southern Iran, the incidence is 5-10 times higher than that in Connecticut. The rise among the Transkei Bantu in South Africa is recent (Ann Int Med 87:494, 1977). In western Kenya esophageal carcinoma is the fifth most common cancer, the male/female ratio is 8:1, and most carcinomas are poorly differentiated (Cancer Res 38:303, 1978). In the United States, multiple separate squamous cell carcinomas of the head and neck and esophagus occur in people with excessive smoking and alcohol intake (Cancer 37:85, 1976). In North America esophageal carcinoma causes 2% of all deaths from cancer with 5% 5-year survival and lower incidence and longer survival rate in women than men.

Lye-induced strictures, Barrett esophagus (with columnar cell lining) (Cancer 41:554, 1978), achalasia, and Plummer-Vinson syndrome are often listed but not too well-documented etiologic factors. Of 14 cases of esophageal adenocarcinoma, 12 developed in Barrett esophagus. Most of these patients have long-lasting hiatal hernia and/or reflux esophagitis (Am J Clin Path 70:1, 1978). Black men in coastal South Carolina have unusually high incidence (JSC Med Assoc 67:453, 1971) (Table 15.1).

Histopathology

Benign tumors are leiomyomas, polyps, and granular cell myoblastomas (South Med J 70:461, 1977). Pseudosarcoma of the esophagus is a polypoid tumor with spindle cells but also with an in situ or invasive squamous cell carcinoma at the base of the pedicle (Arch Path Lab Med 101:604, 1977). In carcinosarcoma both the spindle cells and squamous cells display malignant (metastatic) behavior. The spindle cells may represent mesenchymal metaplasia of the squamous cells (Cancer 37:2275, 1976). Squamous papillomas are small and sometimes multiple (JAMA 236:2655, 1976). Adenocarcinoma occurs in Barrett esophagus (NEJM 291:895, 1974) or at the cardia. The most common esophageal carcinoma is the squamous cell type; even when diagnosed in its in situ stage, it may be multifocal and may show superficial invasion (JAMA 239:335, 1978). Rare oat cell anaplastic carcinomas also occur (Cancer 37:1352, 1976).

Diagnosis and Staging

Infiltrative carcinoma spreads in the wall of the esophagus and narrows its lumen concentrically. Polypoid carcinoma causes irregular filling defects on barium swallow. Both squamous and adenocarcinoma may grow in the polypoid form. Double-contrast barium swallow can detect tumors 0.5-1 cm size (Gastroenterology 1:4, 1976). Ulcerative tumors of the esophagus are leiomyoma, lymphoma, and carcinoma (JAMA 226:1548, 1973). Endoscopic biopsy or cytology provides the final diagnosis. Endoscopy may provide diagnosis very early; early lesions suggest that esophageal carcinoma is of multifocal origin (JAMA 239:335, 1978).

Dysphagia, substernal distress, odynophagia, pharyngeal pain, vomiting, and choking are common complaints (Geriatrics p. 53, Feb 1976).

Diagnosis is best achieved by endoscopic biopsy and/or cytology of saline washings (JAMA 226:1554, 1973). Overall accuracy of fiberoptic endoscopic biopsy and brush cytology is 96% (J Thor Cardiovasc Surg 70:367, 1975).

T_{IS}, T_1, T_2, and T_3 represent carcinoma in situ, tumors involving less or more than 5 cm of the length of the esophagus, and tumor with extraesophageal spread, respectively. N_1 represents palpable unilateral, N_2 bilateral lymph nodes. $N_{1a\text{-}2a}$ are clinically negative, $N_{1b\text{-}2b}$ are clinically positive for metastases. N_3 are fixed lymph nodes. M_{1a} stands for distant lymph node, M_2 for other remote metastases. $T_{IS}\ N_0\ M_0$ and $T_1\ N_0\ M_0$ are stage I disease. $T_1\ N_{1\text{-}2}\ M_0$ and $T_2\ N_{0\text{-}2}\ M_0$ are stage II disease. T_3 or N_3 or M_1 represent stage III disease (CA 25:50, 1975).

As in the staging and prognostication of many malignant tumors, performance status is an important factor. Normal activity: Zubrod 0, Karnofsky 90-100; symptomatic, ambulatory: Zubrod 1, Karnofsky 70-80; ambula-

tory with assistance: Zubrod 2, Karnofsky 50-60; ambulatory with nursing care: Zubrod 3, Karnofsky 30-40; bedridden: Zubrod 4, Karnofsky 10-20.

Esophageal carcinoma causes about 6,000 of the annual cancer deaths in the United States and represents 7% of all gastrointestinal cancers. It is located most often in the lower third of the esophagus (43%); in middle third (37%) and upper third (20%) less often. Survival rates at 60 months are for all esophageal carcinomas in stages I, II, and III: 14, 5, and 3%, respectively. Survival rates at 60 months for low thoracic esophageal carcinoma are only slightly better: 21% for stage I, 7% for stage II, and 4% for stage III (CA 25:56, 1975).

Palmar and plantar keratoderma (tylosis) has been reported associated with esophageal carcinoma and oral leukoplakia (JAMA 235:1723, 1976). Tylosis is often of familial occurrence. This association is based on anecdotal case histories and its validity has been challenged (Arch Derm 105:222, 1972).

Treatment

Recurrent nerve paralysis, tracheoesophageal fistula are the result of local invasion. Regional lymph node metastases are frequent. Of tumors less than 5 cm in size, 50% are already metastatic; 90% of larger tumors are metastatic. Only exophytic tumors causing early obstruction are diagnosed early. Metastases to liver (over 30%) and to lung (over 20%) are present at diagnosis. Thus, status of larynx and trachea, lymph nodes in the mediastinum, and metastases below the diaphragm (JAMA 227:184, 1974) should be assessed before major surgical undertakings; mediastinoscopy and staging laparotomy are frequently done.

Surgical resection is most favorable for lesions of the lower third or cardia. Esophagogastrectomy through left thoracotomy is recommended for these lesions. For carcinoma of the thoracic esophagus, right thoracotomy and a midline upper abdominal incision are done to mobilize both the tumor and the stomach. The stomach is then elevated into the chest and anastomosed with the proximal end of the esophagus; the distal esophagus with the tumor is resected. Resection of the upper esophagus carried high surgical mortality (can be 40%). Radiotherapy remains the treatment of choice for this tumor (Postgrad Med 61:167, 1977). Results with resection alone in 6,781 patients have been reviewed from 1970 to 1975. Resectability and hospital mortality varied from 30 to 72%, and 3 to 28%, respectively. Five-year survival varied from 8 to 29% (Postgrad Med 61:167, 1977). Surgical mortality is decreasing (from 56 to 57% in 1940-1957 to 14 to 31% in 1957-1967) and 2-year survival is increasing (0.6-5% in 1940-1957 to 9-12% in 1957-1967) (JAMA 235:1018, 1976). For unresectable lesions, two palliative surgical procedures are recommended: the placement of the Celestin tube or esophagogastrostomy, bypassing (without resection of) the tumor.

Preoperative radiotherapy and resection only slightly improved survival. Results were reviewed and tabulated (Postgrad Med 61:167, 1977). With operation only, 5-year survival rates varied from 6 to 19%; preoperative radiotherapy and resection gave 14-37% 5-year survival rates. Radiotherapy only (alone or with nonresective surgery) gave 0-20% 5-year survival rates. In South Carolina preoperative radiotherapy and surgery achieved a 28% 5-year survival in one series of patients (JAMA 235:1018, 1976).

Radiotherapy with curative intent (radical radiotherapy) fails when the tumors are larger than 10 cm; these tumors frequently metastasized to regional lymph nodes or extended to the lungs. Twenty percent 5-year survival is among the best results achieved with radiotherapy only directed to tumors of the cervical esophagus for patients who were able to complete the 5,000-rad regimen in 4 weeks (Am J Roentgen Rad Ther Nucl Med 105:500, 1969). The spinal cord is protected by synchronously rotating rods of lead shields. The Edinburgh series are most instructive (Cancer 39:882, 1977). Five-year survival rates with surgical resection for cervical, upper and mid-thoracic, and lower thoracic tumors are 16, 9, and 11%, respectively (total 11%); with radiotherapy these rates are 25, 16, and 12%, respectively (total 17%). A somewhat different analysis of the Edinburgh data is shown in Figure 15.1 (Res Staff Phys p. 58, March 1978). In South Carolina treatment results achieved were 12% 2- and 6% 5-year survival with radiotherapy (6,000 rad in 25 treatments) and 23% 2- and 14% 5-year survival with radiotherapy and surgery (Cancer 38:84, 1976). Supervoltage irradiation endangers the spinal cord, causes esophageal strictures, formation of fistulous tracts, and pulmonary fibrosis (Ann Int Med 77:915, 1972). In summary, for carcinomas at the upper and middle third of esophagus, radiotherapy is preferred. Some of these lesions may be resectable. For lesions in the middle third, right thoracotomy and separate abdominal incision are required. Preoperative irradiation followed by resection has 20% 5-year survival rate. For lower third carcinomas, most surgeons prefer resection with esophagogastrostomy or colon interposition (Ann Thor Surg 26:274, 1978).

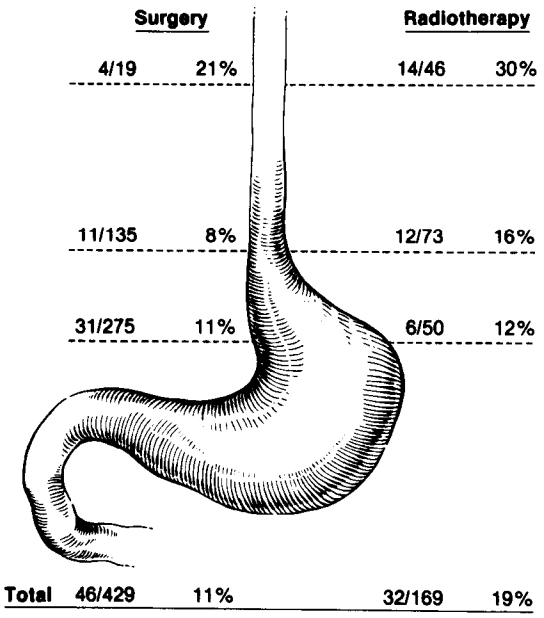

FIGURE 15.1 Five-year survival of esophageal carcinoma according to site and treatment modality. Numerator, patients alive; denominator, patients treated.

Intravenous hyperalimentation (Ann Thor Surg 23:400, 1977; Cancer 39:410, 1977) and chemotherapy with radiotherapy (methotrexate, bleomycin) appear to favorably influence short-term survival. Cis-platinum and bleomycin can produce 21% CRPR rate (ASCO 19:352, 1978 C-183) (Table 15.1).

TABLE 15.1 Carcinoma of Esophagus

Multiple squamous carcinomas	Panendoscopy (bronchoscopy, laryngoscopy, esophagoscopy) (Cancer 50:1195, 1982) reveals 17% of cases c multiple primary tumors occurring synchronously. Metachronous occurrence is over 35%. Carcinomas of the aerodigestive tract are often multifocal; silent second synchronous primary tumors coexist c index lesion (Cancer 50:1195, 1982). Of 21% second primary carcinomas, 12% were oropharyngeal carcinomas, 9% visceral carcinomas of malignant lymphoma (Cancer 48:329, 1981). In Hungary, 11 second primary tumors were found in 385 pts (Orv Hetil 123:971, 1982).
Diagnosis	Barium swallow (esophagography c double contrast); esophagoscopy c biopsies; gastrocamera. Lavage exfoliative cytology; suction-abrasive cytology tube (Cancer 50:782, 1982). Gallium-67 scan detects extraesophageal spread and lymph node metastases (Cancer 49:1031, 1982).
Staging	Pretherapy staging by CT scanning (Am J Rad 136:1051, 1981). CT scan of mediastinum. Mediastinoscopy. Exploratory thoracotomy and/or laparotomy (Cancer 50:2566, 1982).
	T_1 <5 cm s obstruction, circumferential involvement, extraesophageal spread (no recurrent laryngeal, phrenic, or sympathetic nerve involvement; no vena caval or azygos vein obstruction; no involvement of trachea or bronchus).
	T_2 >5 cm s extraesophageal spread; tumor of any size c circumferential involvement and/or obstruction.
	T_3 extraesophageal spread.
	Stages I T_1 N_0 M_0 II T_2 N_0 M_0 III T_3 or N_1 or M_1
Natural history	Incidence was 9,000 new cases in U.S. in 1982. Presentation in stages II and III is common. Most common metastatic sites are lymph nodes (73%), lungs (52%), liver (47%). Most common causes of postoperative deaths are pyothorax, pulmonary failure, failure of sutures, hemorrhage. Most common cause of death in survivors of surgery: recurrent tumor (78%). Causes of death after 10-yr survival: respiratory failure (35%); second malignancy (25%). Complications: tracheoesophageal fistula (J Thor Cardiovasc Surg 82:194, 1981). Brain metastases: 17/566 autopsied pts (CA 33:164, 1983). Bone metastases c hypercalcemia (Arch Int Med 142:2207, 1982).
	Presentation c achalasia may be due to carcinoma of distal esophagus (Ann Int Med 89:315, 1978).

TABLE 15.1 (Continued)

Natural history (continued)	Second primary squamous cell carcinoma 12 yr after curative resection of previous carcinoma (Cancer 51:2327, 1983).
Immunology	More than half of pts c̄ esophageal carcinoma circulate lymphocytes cytotoxic to cultured allogeneic esophageal carcinoma cells; 23% of pts c̄ other cancers and 4% of healthy subjects yield cytotoxic lymphocytes (Ann Otol Rhin Laryng 90:359, 1981).
Etiology	Alcoholism. High mortality ($13.6/10^5$) in heavy drinker French males (Cancer 48:329, 1981). Increasing frequency among black male veterans c̄ heavy alcohol consumption in U.S. (Cancer 49:610, 1982). Drinkers of hard liquor are at higher risk than drinkers of wine and beer; poor general nutrition is another risk factor (JNCI 67:777, 1199, 1981).
	Alcohol consumption as major etiologic factor in Hungary (Orv Hetil 123:971, 1982). Geographic areas of increased frequency suggestive of environmental factors. In U.S.: South Carolina, Georgia, northern Florida. In northern China mortality varies from $1.4/10^5$ to $140/10^5$ suggesting environmental etiologic factors (Chin Med J 1:167, 1975; Cancer Res 40:2633, 1980). Chicken in the high incidence area also develop "gullet cancer" (squamous cell carcinoma). Consumption of moldy food and pickled vegetables; ingestion of hot (60-80°) food are etiologic factors. Fibrous silica contaminating flour in northeast Iran (Internat J Cancer 26:617, 1980). In Transkei, South Africa, synergistic action of alcoholic beverages (homemade) and tobacco smoked in pipes was postulated (Internat J Cancer 29:249, 1982). Nutritional factors: Protein and/or vitamin deficiency; nitrosamines; tannin; opiates (at Caspian region of Iran) (Brit J Cancer 39:293, 1979).
	Riboflavin, nicotinic acid, magnesium, and zinc deficiency in Africa (JNCI 67:243, 1981).
	Caustic burns. Interval between injury and carcinoma 46 yr. Resection is possible c̄ long survival (Ann Surg 194:146, 1981). Achalasia: Associated c̄ carcinoma in 3 of 125 pts (Orv Hetil 121:1643, 1980). Progressive systemic sclerosis c̄ chromosomal breaks and esophageal carcinoma (NY State J Med 81:1748, 1981).
	Identification of high-risk groups for periodic screening: heavy alcohol consumption and cigarette smoking; previous head and neck carcinoma; lye strictures; achalasia; Barrett esophagus; tylosis; hiatal hernia; Plummer-Vinson syndrome (South Med J 73:25, 1980).
	Iron deficiency anemia and Plummer-Vinson syndrome associated c̄ carcinoma of upper esophagus. Adenocarcinoma of lower esophagus associated c̄ columnar epithelium. Squamous cell carcinoma associated c̄ tylosis palmaris or achalasia (Cancer 50:

TABLE 15.1 (Continued)

Etiology (continued)

2554, 1982). Squamous cell carcinoma within radiation field in pt treated by XRt for breast carcinoma (Cancer 52:1808, 1983).

Dietary carcinogens and mutagens (Science 221:1256, 1983):

Carcinogenic chemical	Origin	Comment
Safrol	Oil of sassafras in root beer; piperine in black pepper	Piperine caused tumors in mice
Hydrazine	Mushrooms	Agaritine caused stomach carcinomas in mice
Furocoumarines	Celery, parsnips, figs, parsley	Mutagenic
Anthraquinones	Rhubarb; mold toxins	Mutagenic
Theobromine	Cocoa powder; chocolate	Genotoxic; causes testicular atrophy
Gossypol	Cottonseed	Testicular atrophy; sterility
Phorbol esters	Euphorbiaceae	Promoters of carcinogens
Alcohol (ethyl)	Grapes, grains	Acetaldehyde mutagenic, teratogenic, carcinogenic
Aflatoxin and sterigmatocystin	Molds	Mutagens and carcinogens
Nitrosamines	Formed from nitrate and nitrite	Carcinogens
Fat	Meat	Lipid peroxidation reaction yields mutagens and carcinogens

Anticarcinogenic substances in diet (Science 221:1256, 1983):

Substance	Biologic effects
Tocopherol (vitamin E)	Protection against radiation-induced DNA damage; against carcinogenicity of quinones

TABLE 15.1 (Continued)

Etiology (continued)	Substance	Biologic effects
	Carothene	Counteracts singlet oxygen's mutagenic and lipid-peroxidizing effects derived from pigment-mediated transfer of energy from light to oxygen
	Ascorbic acid (vitamin C)	Antioxidant; counteracts chemical carcinogenesis
	Glutathione	Antioxidant; counteracts carcinogenicity of aflatoxin
	Nitrosamines produced in stomach from nitrite and amides. Water-soluble ascorbate (vitamin C) and fat-soluble tocopherol (vitamin E) reduce nitrite to nitric oxide thus preventing nitrosamine formation. Negative effect on developing gastric carcinoma in people consuming fresh fruits and vegetables (JNCI 71:631, 1983).	

Unusual types of tumors

Lye corrosion: mean age at lye ingestion 6 yr. Mean age of carcinoma development 41 yr. The later lye was ingested, the earlier carcinoma developed. Most carcinomas arose at the level of tracheal bifurcation. All carcinomas were of squamous cell type. With resection and/or XRt, 10% of pts survived over 7 yr (Cancer 45:2655, 1980).

Adenocarcinoma of esophagus and scleroderma (Am J Rad 140: 972, 1983).

Barrett esophagus (Am J Med 74:313, 1983; Human Path 14:42, 1983): columnar epithelium instead of stratified squamous epithelium. Complications: stricture at junction of stratified squamous epithelium and columnar epithelium; ulcers; adenocarcinoma in columnar epithelium. Dysplasia (leading to adenocarcinoma?) found in 10 of 12 pts $\bar{c}$ Barrett esophagus (Ann Int Med 97:103, 1982). Primary adenocarcinoma of esophagus constitutes 2% of all esophageal malignant tumors (J Surg Oncol 18:153, 1981). Linitis plastica type adenocarcinoma of the lower esophagus (Cancer 51:2139, 1983).

Adenocarcinoma occurred in distal esophagus years after subtotal resection of Barrett esophagus $\bar{c}$ colonic interposition; thus antiflux therapy does not prevent carcinogenesis in remnants of Barrett esophagus (Gastroenterology 86:356, 1984). CT scans evaluate resectability well (Am J Rad 138:1077, 1982).

Oat cell carcinoma: argyrophilic tumor cells containing dense core granules; may coexist $\bar{c}$ squamous cell or adenocarcinoma (Cancer 45:2342, 1980; 51:1944, 1983; J Surg Oncol 19:145, 1982). Neuroendocrine carcinomas of esophagus (Pathology 165:99, 1979). Malignant melanoma of esophagus (Am J Gastroent 77:840, 1982).

TABLE 15.1 (Continued)

Unusual types of tumors (continued)	Granular cell tumors (granular cell myoblastoma of Abrikossoff): Granular cytoplasm often forms syncytium. Tumors may be multicentric. Standard treatment is wide excision but unexcised tumors may remain stable and asymptomatic for years (Endoscopy 12:245, 1980; Am J Gastroent 75:426, 431, 1981; J Surg Oncol 20:14, 1982). Kaposi sarcoma (Brit J Rad 53:807, 1980). Leiomyosarcoma (NY S J Med 82:1100, 1982). Paraganglioma, functional (pheochromocytoma) in organ of Zuckerkandl associated with squamous cell carcinoma of esophagus (J Surg Oncol 20:182, 1982). Malignant lymphoma coexisting c squamous cell carcinoma of esophagus (NEJM 307: 41, 1982). Pt had hypercalcemia s bone metastases. Mechanisms of hypercalcemia: nonhumoral, locally mediated bone resorption by metastatic tumor cells; secretion of osteoclast-activating factor by lymphoma cells; humoral, by ectopic parathyroid hormone secretion from squamous carcinoma cells; hyperparathyroidism associated c malignant tumors (NEJM 306:995, 1982; 307:41, 1982). Squamous cell carcinoma, spindle cell variant (Histopathology 5:403, 1981). Superficial spreading carcinoma: intramucosal extension 2 cm or more from main lesion c frequent early lymph node metastases. Margin of proximal resection may not be tumor-free (Cancer 50:1641, 1982). Squamous cell papilloma: verrucous tumor containing human papilloma virus antigens (Diagn Histopath 5:291, 1982). Squamous cell carcinoma within diverticulum (Japan J Surg 10: 142, 1980). Adenoid cystic carcinoma (Gastrointest Endosc 26:102, 1980).

	Carcinoma	Upper third	Middle third	Lower third	Pts	%
Distribution	Squamous	2	43	20	65	78
	Adeno-	1	2	7	10	12

(Am J Surg 137:32, 1979)

Treatment

Surgery. T_1 N_0 M_0 lesion is potentially curable. Palliation c intraluminal tubes, feeding gastrostomy, colon bypass, extrapleural anterior esophagogastrostomy. Of 111 pts c gastroesophageal junction carcinoma, 57 (52%) had resection: 32% c curative intent, 14% for palliation. Operative mortality was 32% (18/57 pts). Mortality rates for procedures were 71% for colon interposition; 67% for gastric tube; 11% for esophagogastrectomy. Morbidity and mortality for endoprosthesis was 65%. Anastomotic leak was major complication. Mean survival of pts

TABLE 15.1 (Continued)

Treatment (continued)

resected c̄ curative intent was 17 mo c̄ 2-, 3-, and 5-yr survival rates of 26, 9, and 5% (Cancer 46:1873, 1980).

Esophagectomy and intrathoracic gastrostomy (resection of esophagus and reconstruction by esophagogastrostomy) c̄ resectability of 93% and mortality of 7%; no anastomotic leakage (Am J Surg 137:32, 1979).

Of 100 pts, 58 will be explored, 39 will be resected; 13 of these will die postoperatively; 26 will leave the hospital; 18 of these will live 1 yr, nine 2 yr, and four 5 yr (Lancet 2:728, 1980).

Surgical results in China: 5-, 10-, and 20-yr survival rates after radical resection: 28, 20, and 7.4%; 5-yr survival after palliative resection 2%. Tumors at lower third of esophagus yielded the highest, tumors at upper third of esophagus the lowest survival. Five-year survival rates c̄ and s̄ lymph node metastases were 6 and 48%. Of 82 pts who died after 5 yr, 5 died c̄ recurrent carcinoma in esophagus and 8 died c̄ malignant tumors at sites other than esophagus (Chin Med J 94:729, 1981).

In Japan operative mortality was 1.4% and overall 5-yr survival rate was 34% c̄ lymph node dissection of the posterior mediastinum, superior gastric and celiac regions, and resection of the proximal lesser curvature and cardia c̄ 4-5 branches of the gastric artery during thoracic and abdominal esophagectomy; resectability rate was 59% (Ann Surg 194:438, 1981).

Esophageal intubation procedures to avoid inanition (Ind J Cancer 17:97, 1980; Surg Gyn Obstet 151:671, 1980; World J Surg 4:451, 1980).

Surgery and XRt.

Treatment (Cancer 48:63, 1981)	Pts	% Surgical mortality	% 1-yr survival
Esophageal resection c̄ esophagogastrostomy; or colonic interpolation	22	25	23
Resection as above; XRt pre- and postoperatively	28	35	50

XRt. 5,000 rad in 20 fractions over 28 days for selected pts: 20% 5-yr survival (Cancer 39:882, 1977). For nonselected pts 7% 5-yr survival (Cancer 48:63, 1981). Addition of bleomycin to XRt: no therapeutic advantage but increased toxicity (Internat J Rad Oncol Biol Phys 6:821, 1980).

Preoperative XRt: Frequent progression of tumor resulting in inoperability. Only 7 and 5% survival at 3 and 5 yr (Your Pt & Cancer p. 81, May 1983).