

Correspondence and Short Communications

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OESOPHAGEAL CARCINOMA FOLLOWING INTERNAL MAMMARY CHAIN IRRADIATION FOR CARCINOMA OF THE BREAST—A REPORT OF SIX CASES

Radiation-induced oesophageal cancer is extremely rare. However, a significant excess of oesophageal cancers has been found in patients irradiated for ankylosing spondylitis (1), and in atomic bomb survivors (2). Radiotherapy for inner quadrant breast carcinoma often includes internal mammary chain, resulting in irradiation of the oesophagus as well. However, so far only a few cases of oesophageal carcinoma following irradiation for breast cancer have been reported in the literature (3, 4). In the present report six cases of oesophageal carcinoma following irradiation of internal mammary chain for breast cancer are described.

Case 1. A 60-year-old housewife presented in December 1968 with a lump in the upper inner quadrant of the right breast. She was a non-smoker and did not take any alcohol. She underwent a simple mastectomy and histology showed intraductal carcinoma of the breast. In January 1969 she commenced a 5-field postoperative radiotherapy on a 250 kV machine; 45 Gy (total dose) in 23 fractions, 40 Gy (incident dose) in 23 fractions and 40 Gy (incident dose) in 20 fractions were given to the right chest wall and axilla, supraclavicular fossa, and parasternal region respectively. The approximate dose in the oesophagus was calculated as 29 Gy. In December 1980, she presented with a one-month history of dysphagia. An oesophagoscopy showed a stricture at 22 cm and a biopsy revealed poorly differentiated squamous cell carcinoma.

Case 2. A 63-year-old machinist presented in January 1976 with a lump in the upper inner quadrant of the right breast. She smoked 10 cigarettes a day and took alcohol on social occasions. She underwent a simple mastectomy and histology showed infiltrating ductal carcinoma of the breast. Six weeks later she commenced a 5-field postoperative radiotherapy to the chest wall and regional nodal areas on a cobalt-60 machine. A total dose of 40 Gy in 15 fractions was given to the right chest wall with parallel tangential fields. A total dose of 40 Gy in 15 fractions was given to the right supraclavicular fossa and axilla with an anterior field and posterior axillary boost. An incident dose of 40 Gy in 15 fractions was given to the parasternal region. The approximate dose to the oesophagus was calculated as 30 Gy. In August 1983, she presented again with dysphagia and weight loss. Oesophagoscopy showed a stricture in the mid oesophagus and biopsy revealed small cell carcinoma of the oesophagus.

Case 3. A 63-year-old housewife presented in June 1968 with a lump in the upper inner quadrant of the right breast. She was a non-smoker but drank alcohol on social occasions. A simple mastectomy and axillary clearance was performed. Histology showed invasive ductal carcinoma of the breast, but the lymph nodes were not involved. She received a 5-field postoperative radiotherapy to the right chest wall and regional nodal areas on a 220 kV machine. A total tumour dose of 37.8 Gy in 22 fractions was given to the right chest wall with parallel tangential field. A total tumour dose of 40 Gy in 20 fractions was given to the right supraclavicular fossa and axilla with an anterior field and poste-

rior axillary boost. An incident dose of 40 Gy in 20 fractions was given to the parasternal region. The approximate dose in the oesophagus was calculated as 24 Gy. In February 1985, she presented again with a 5-week history of progressive dysphagia and weight loss. Endoscopy showed a malignant stricture at 26 cm and biopsy revealed squamous cell carcinoma.

Case 4. A 56-year-old shop assistant presented in October 1975 with a lump in the inner quadrant of her right breast. She was a non-smoker but drank a moderate amount of alcohol regularly. Frozen section confirmed poorly differentiated invasive ductal carcinoma of the breast and she underwent a right simple mastectomy. Six weeks later she underwent a 5-field postoperative radiotherapy to the right chest wall and regional nodal areas on a cobalt-60 machine. A total tumour dose of 40 Gy in 15 fractions was given to the right chest wall with parallel tangential fields. A total tumour dose of 40 Gy in 15 fractions was given to the right supraclavicular fossa and axilla with an anterior field and posterior axillary boost. An incident dose of 40 Gy in 15 fractions was given to the parasternal region. The approximate dose in the oesophagus was calculated as 30 Gy. In February 1989, she presented again with a 5-month history of progressive dysphagia. Oesophagoscopy showed a malignant stricture in the middle third of the oesophagus and biopsy revealed poorly differentiated squamous cell carcinoma.

Case 5. A 42-year-old accountant presented in May 1952 with a lump in the upper inner quadrant of her left breast. She was a non-smoker and did not take any alcohol. A course of radiotherapy was given to the left breast and left axilla. A total of 49 Gy in 20 fractions was given to both areas on a 220 kV machine over 25 days. The approximate dose in the oesophagus was calculated as 24 Gy. She also received artificial menopause with methyltestosterone. In August 1952 she underwent a radical left mastectomy and remained disease-free. In April 1957 she developed a small skin nodule over the left clavicle and received further local radiotherapy. A total of 30 Gy (incident dose) in 10 fractions over 13 days was given on a 100 kV machine. In April 1986, she presented again with a 4-month history of progressive dysphagia. Oesophagoscopy showed a malignant stricture at 28 cm and biopsy confirmed poorly differentiated squamous cell carcinoma.

Case 6. A 49-year-old clerk presented in May 1976 with a lump in the lower inner quadrant of the left breast and enlarged axillary lymph nodes. She was a non-smoker but drank alcohol on social occasions. Frozen section showed invasive ductal adenocarcinoma and she underwent a left simple mastectomy and axillary clearance. All four axillary lymph nodes showed metastatic disease. She received a 4-field postoperative radiotherapy to the chest wall and regional lymph node areas. A total tumour dose of 40 Gy in 20 fractions was given with x-rays from a 2 MeV Van de Graaff machine. A separate parasternal field was not used, but the medial chest wall tangential field came well across the midline. The approximate dose to the oesophagus was calculated as 31 Gy. In June 1982, she developed lung metastasis and was commenced in tamoxifen. In November 1984, she complained of dysphagia and an oesophagoscopy showed a malignant stricture at 18 cm. Biopsy revealed poorly differentiated squamous cell carcinoma.

Discussion. Oesophageal carcinoma arising in patients who undergo radiotherapy for breast cancer is extremely rare. This may be due to the fact that the technique used to treat the breast or chest wall often includes tangential parallel opposing fields and the radiation dose received by the oesophagus is very small. In patients who have inner quadrant tumours some radiotherapists opt to treat the internal mammary chain and either employ a separate parasternal field or move the medial tangential parallel opposing field well across the midline. This will increase the radiation dose received by the oesophagus considerably. Some departments use electron beams to treat the internal

mammary chain and this could reduce the dose received by the oesophagus.

The first four patients in our report received parasternal field irradiation and the calculated approximate dose received by the oesophagus using standard isodose diagrams was 29, 30, 24, and 30 Gy respectively. They developed oesophageal tumour after 11, 7, 16 and 13 years. The fifth patient was treated with 220 kV x-rays but the technique used has not been recorded. She was treated in 1952 and it is likely that direct anterior fields may have been used and the calculated approximate dose received by the oesophagus was 24 Gy. She developed oesophageal carcinoma after 33 years. The sixth patient was treated with tangential parallel opposing fields but the medial tangential field was well across the midline to include the internal mammary chain. The approximate dose received by the oesophagus was 31 Gy and she developed oesophageal carcinoma after 8 years. All six carcinomas occurred in the middle third of the oesophagus. Five of them had squamous cell carcinoma and one had small cell carcinoma.

Tobacco and alcohol are the two major risk factors for oesophageal cancer. In our patients only one smoked cigarettes and one consumed moderate amounts of alcohol. Three took alcohol on social occasions and two did not smoke or drink. The rarity of female oesophageal cancer, the spatial connection between the exposure and the tumours, and the long latency times suggest a causal relationship between irradiation and oesophageal cancer. However, an estimation of the risk of oesophageal cancer requires a large cohort study and a retrospective cohort study of women postoperatively irradiated for breast cancer should be of considerable interest.

Key words: Oesophageal cancer, radiation-induced, breast cancer, postoperative radiotherapy.

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IS AN OESOPHAGOBRONCHIAL FISTULA AN ABSOLUTE CONTRAINDICATION FOR TREATMENT IN CASES OF OESOPHAGEAL CANCER?

This case report concerns a 68-year-old man referred to the Oncology Department at University Hospital, Lund, in September 1986, with a diagnosis of squamous cell carcinoma of the oesophagus. He had been a habitual smoker for many years (25 cigarettes daily). For three years he had undergone treatment for hypertension. He also had increasing claudicatio intermittens, and in December 1985 he had an aortobifemoral graft performed.

During the autumn of 1985 he had intermittent chest pains, unrelated to exertion. Originally investigated by cardiologists, the patient's condition was interpreted as angina pectoris. The pains became successively worse, and the patient began to suffer from dysphagia entailing a gradual transition to fluid nutrients and a weight loss of 10 kg. In August 1986, he was admitted to hospital with leukocytosis and a markedly raised ESR. The presence of an abdominal abscess in conjunction with his graft was suspected, though abdominal ultrasound produced no pathological findings.

Antibiotic treatment was instituted, but a low grade fever remained. In September 1986, gastroscopy indicated the presence of a 6 cm long neoplasm in the distal part of the oesophagus, 42 cm from the upper incisor teeth, followed by 2 cm of normal mucosa and a normal ventricle. A biopsy taken at gastroscopy showed the neoplasm to be a moderately differentiated squamous cell carcinoma. CT of thorax and abdomen showed thickening of the oesophageal walls, extending from the arch of aorta to the hiatus, and two lymph nodes in the mediastinum of which the larger measured 1.3 cm. The presence of atelectasis and tumour extension to the basal lung could not be excluded. No liver metastases were found. Bronchoscopy revealed the presence of an oesophago-bronchial fistula. The patient was treated with continuous pleural drainage, antibiotics and a duodenal probe. His general condition was considered too poor for active treatment of the oesophageal cancer and he was transferred to a local hospital for palliative care. He remained there until December 1986, received a gastrostomy and gradually improved; his weight increased by 8 kg and the pleural empyema cleared up. A new bronchoscopy showed no sign of fistulae. CT of the thorax showed the extent of the tumour to be unchanged, and an attempt to treat his cancer was started.

Initially, three courses of induction chemotherapy with cisplatin and 5-FU (5-fluorouracil) were planned, to be followed by radiotherapy and possibly surgery. The first course of cytostatic treatment was started in June 1987, and consisted of cisplatin (100 mg/m²) on day 1 followed by 5-FU (1 000 mg/m²) in continuous infusion for 5 days. On the second day of the cytostatic treatment the patient suffered an attack of syncope; he also had mild chest pains, and ECG showed ST elevations (aVR, II, aVF and v3-6). The cardiological picture was consistent with a cardiospasm induced by 5-FU, and there was no sign of myocardial infarction. The patient was given a calcium blocker (Cardizem, 60 mg × 3, daily) and completed the cycle of cytostatic treatment without complications, but it was considered too risky to continue the chemotherapy with further cycles.

At this stage oesophageal radiography, CT of the thorax and MRT showed regression of the tumour, and during June and July of 1987 he was given megavoltage x-ray therapy for the oesophageal cancer-fractionated irradiation (42 Gy/21 F with the AP-PA technique) of the primary with 5 cm margins also including the coeliac lymph nodes. He was again examined by thoracic surgeons but, although the tumour was considered resectable, owing to his cardiovascular condition and earlier pleural empyema surgery was felt to be technically difficult and coupled with considerable risk.