

Two rare complications in a single patient of lung cancer: Radiation-induced spontaneous esophageal perforation and aortic rupture and their successful management

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Abstract:

Adjuvant radiotherapy is indicated in few operated cases of lung cancer for effective local control. Oesophageal perforation and aortic rupture are rare and lethal complications of postoperative adjuvant radiotherapy. Both of these complications happened in a 64 year male patient with squamous cell carcinoma of lung. Radiation induced oesophageal perforation occurred immediately after completion of radiotherapy. Endoscopic Self Expanding Radio Therapy (SEMS) was placed, thoracic cavity was debrided and window thoracostomy was performed. After few months of this episode, he had torrential bleeding from descending thoracic aorta. Thoracic Endo Vascular Aortic Repair (TEVAR) was done and bleeding was controlled. This case is unique because both these fatal events happened in a single patient. This report also highlights the use of above mentioned novel therapeutic methods for successful management of these complications in these frail patients.

Keywords:

Aortic rupture, esophageal perforation, lung cancer, radiation therapy

The role of adjuvant radiotherapy after surgery in nonsmall cell lung carcinoma (NSCLC) is well established in selected cases, but it is not without its side effects. Fatal complications such as radiation-induced esophageal perforation and aortic rupture have been rarely reported in the literature. Herein, we are reporting the occurrence of these two rare complications in a single patient and their successful management in an operated case of NSCLC.

with complaints of shortness of breath on exertion for 2 months. On detailed evaluation, he was diagnosed to have right lower lobe mass lesion. Biopsy was suggestive of moderately differentiated squamous cell carcinoma. Endobronchial ultrasound and mediastinal lymph node evaluation was negative. He underwent thoracotomy and left lower lobectomy with systematic lymph node dissection (pT2N0) followed by adjuvant chemotherapy. On 1 year follow up, CT scan chest was suggestive of recurrence of squamous cell carcinoma in left upper lobe. He underwent completion pneumonectomy on the left side. Postoperative radiotherapy (PORT) was given (54 Gy) in divided fractions to

Case Report

A 64 years gentleman presented to us

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decrease local recurrence. Immediately, after completion of radiotherapy, he noticed yellowish discharge from thoracotomy wound admixed with food particles. Esophagoscopy revealed perforation of the esophagus. Self-expanding metal stent (SEMS) was placed in the esophagus to control further contamination, and window thoracostomy was done on the left side to control local sepsis. He was discharged in a stable condition after few days. After 4 months, he had torrential bleeding from window thoracostomy. The physician at the local facility tightly packed the hemorrhagic site with sponges, and the patient was airlifted to our emergency department. At the time of arrival, his pulse rate was 122 beats/min, blood pressure was 92/58 mm of Hg and he was on minimal inotropic support. After initial resuscitation, he was rushed to Vascular catheterization laboratory, right femoral artery was cannulated, and conventional aortogram was performed. Angiogram revealed an area of extravasation of dye suggestive of radiation-induced spontaneous aortic perforation [Figure 1]. Thoracic endovascular aortic repair (TEVAR) was chosen as the therapeutic modality. A 22 Fr – 26 mm × 26 mm × 100 mm stent graft was implanted extending just distal to left subclavian arterial origin to origin of lumbar arteries [Figure 2]. External examination also revealed stoppage of bleeding [Figure 3]. Post procedure, he was shifted, ventilated for 24 h, and extubated on day 2. In view of the possibility of massive bleed from aorta, he was counseled for omentoplasty for aortic perforation cover with cervical esophagostomy for esophageal diversion. However, the patient and relatives did not give consent for surgery and requested discharge [Figure 4]. After 6 months of telephonic follow-up, he was doing well.

Discussion

PORT has been the standard therapeutic modality for local prevention of local recurrence in selected patients of lung cancer. However, early and late radiation toxicity continues to be a major cause of morbidity. Although uncommon, radiation injury to the surrounding organs such as esophagus, aorta, tracheobronchial tree, and brachial plexus has been reported in the literature.^[1] Our case is unique in the way that two of these rare complications (radiation-induced esophageal perforation and aortic rupture) occurred in a single patient.

Esophageal complications after radiation therapy are well described in the literature. These complications range from mild-grade esophagitis to severe-grade esophageal perforation. These are considered early if it happened <90 days and late if it happened >90 days.^[2] In our case, this complication happened immediately after the completion of radiotherapy which is very unusual. Described treatment modalities for esophageal perforation



Figure 1: Aortogram depicting extravasation of dye

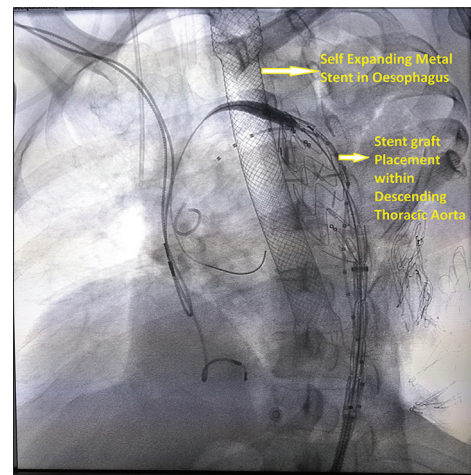


Figure 2: Stent graft placement within aorta

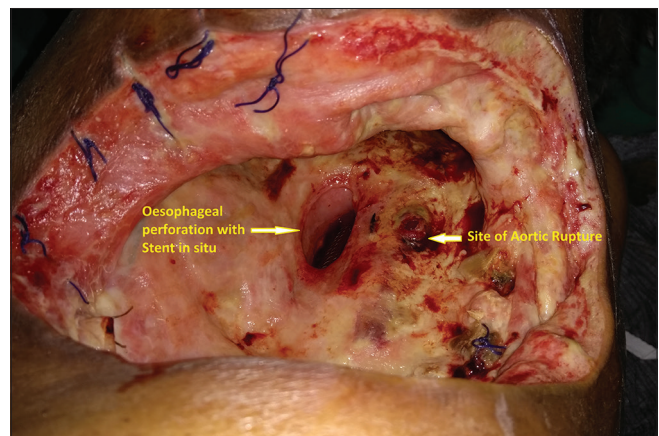


Figure 3: Window thoracostomy showing esophageal perforation and site of aortic rupture

are endoscopic clipping, endoscopic stent placement, and esophagectomy (1-stage or 2-staged).^[3,4] Primary surgical repair is not a recommended procedure in view of radiation-induced necrosis and devascularization. We opted for endoscopic SEMS placement. Our plan was

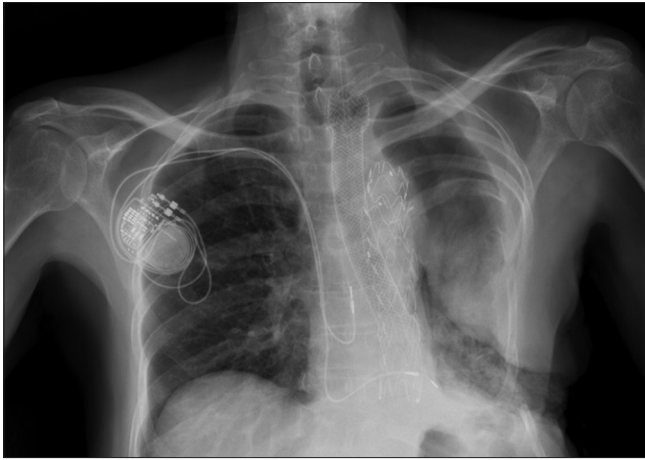


Figure 4: Chest X-ray posteroanterior view showing both aortic and esophageal stents *in situ*

to conservatively manage him for 4–8 weeks and then plan for definitive surgical management. However, after 8 weeks of this incident, another catastrophe happened.

Radiation injury to vessels has been reported to occur even 10 years after radiation therapy.^[5] However, in our case, this catastrophe happened 2 months after completion of radiation therapy. Vascular hyaline necrosis associated with hypoperfusion of elastic muscle layer due to occlusion of vasa vasorum was proposed as the pathogenesis.^[6] Along with radiation injury, local sepsis due to prior esophageal perforation also can be attributed to this condition in our case. Surgical repair is the standard of therapy in aortic perforation. However, therapeutic efficacy of TEVAR for aortic rupture has been previously reported in literature.^[7,8] We opted for TEVAR in this emergency situation because surgical repair with sutures may not hold at the rupture site because of radiation-injured inflammation and necrosis.

Conclusion

Spontaneous esophageal perforation and aortic rupture are known uncommon complications of radiotherapy. However, the occurrence of both of them in a single patient is very rare. Use of minimally invasive methods (Endoluminal stent therapy and TEVAR) to

address these emergency situations helped our patient to avoid open surgical repair. Early diagnosis and prompt surgical intervention are the key to success.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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