Respiratory Medicine Case Reports 18 (2016) 22–23

Contents lists available at ScienceDirect

Respiratory Medicine Case Reports

journal homepage: www.elsevier.com/locate/rmcr

Case report

Tracheo-parenchymal fistula following concurrent chemo-radiation for stage III NSCLC

Bashar Alzghoul [a], Nikhil Meena [a, b, *]

[a] Department of Internal Medicine, University of Arkansas for Medical Sciences, Little Rock, AR, United States
[b] Division of Pulmonary and Critical Care Medicine, University of Arkansas for Medical Sciences, Little Rock, AR, United States

ARTICLE INFO

Article history:
Received 25 January 2016
Received in revised form
20 March 2016
Accepted 21 March 2016

Keywords:
Bronchoscopy
Lung cancer
Chemo-radiation
Tracheo-pulmonary fistula

ABSTRACT

Non-Small Cell Cancer (NSCLC) are frequently diagnosed at a later stage [1]. Treatment involves chemotherapy and radiation, either sequentially or concurrently [2]. Concurrent therapy is more efficacious but also associated with more complications [4–6]. We present a rare care of trachea-pulmonary fistula formation after concurrent chemo and radiation in a patient with Squamous Cell Cancer (SCC).

1. Case presentation

A 57-year-old man current everyday smoker, presented with productive cough, hemoptysis, fever, chills and generalized weakness. He had previously been diagnosed with poorly differentiated SCC and was already on concurrent chemo-radiation. Initial chest tomography (CT) of chest revealed a hilar mass measuring 3.2 × 3.3 cm with some endo-bronchial component, narrowing the right main bronchus (Fig. 1A). Patient completed concurrent chemo radiation treatment with Cisplatin- Etoposide. A follow up chest CT prior to the current presentation revealed significant improvement.

On physical examination, patient was febrile and had cavernous breath sounds in the right upper zone. CT chest with contrast (Fig. 1B) revealed the development of thick walled cavity in the right upper lobe (RUL) entered into the trachea just above the right upper lobe bronchus, in the largest dimension the was 7.5 × 4.5 cm in size. Sputum culture grew methicillin resistant Staphylococcus Aureus (MRSA). Patient was treated with intravenous antibiotics. However, due to continued fevers a bronchoscopy was done, this revealed the large cavity, The bronchus intermedius that was almost completely walled off and a stent to open up the lower lobe was not placed due to the high risk of converting the cavity into an abscess (Fig. 1C). After discussion with the patient and his family the goals of care were changed to comfort based therapies.

2. Discussion

NSCLC can present in stage III 25% of the time [1]. The standard therapy for stage III NSCLC in patients with good performance and minimal cancer related weight loss is concurrent chemo radiation with curative intent [2]. Concurrent chemo-radiation (CCRT) can improve the five year survival from 5% for radiotherapy alone and 15% with sequential chemo-radiotherapy to 25% [1]. This survival benefit is likely due to better loco-regional control of the disease with concurrent treatment instead of sequential treatment or radiotherapy alone [3].

CCRT is commonly associated with increased toxicity including acute esophagitis and neutropenia [4]. In addition, CCRT can cause local pulmonary toxicities, such as bronchial stenosis and fatal pulmonary hemoptysis [5]. Tumor cavitation has been reported as well. In one study, two out of 71 patients with stage III NSCLC undergoing CCRT developed de-novo cavitation [6]. There are increasing reports of NSCLC fistulization following CCRT, especially when using anti-angiogenic targeted therapy like Bevacizumab [7–10]. Mortality rates are high with acquired bronchial tree fistulae especially if blood vessels were involved in the tract leading to fatal hemorrhage [9]. In our patient, the cavity was surprisingly large when taken in context of the absence of a parenchymal mass. Tumor cavitation and subsequent fistula formation may actually

* Corresponding author. 4201 W. Markham Street, Slot #555, Little Rock, Arkansas, United States.
E-mail address: nkmeena@uams.edu (N. Meena).

http://dx.doi.org/10.1016/j.rmcr.2016.03.007

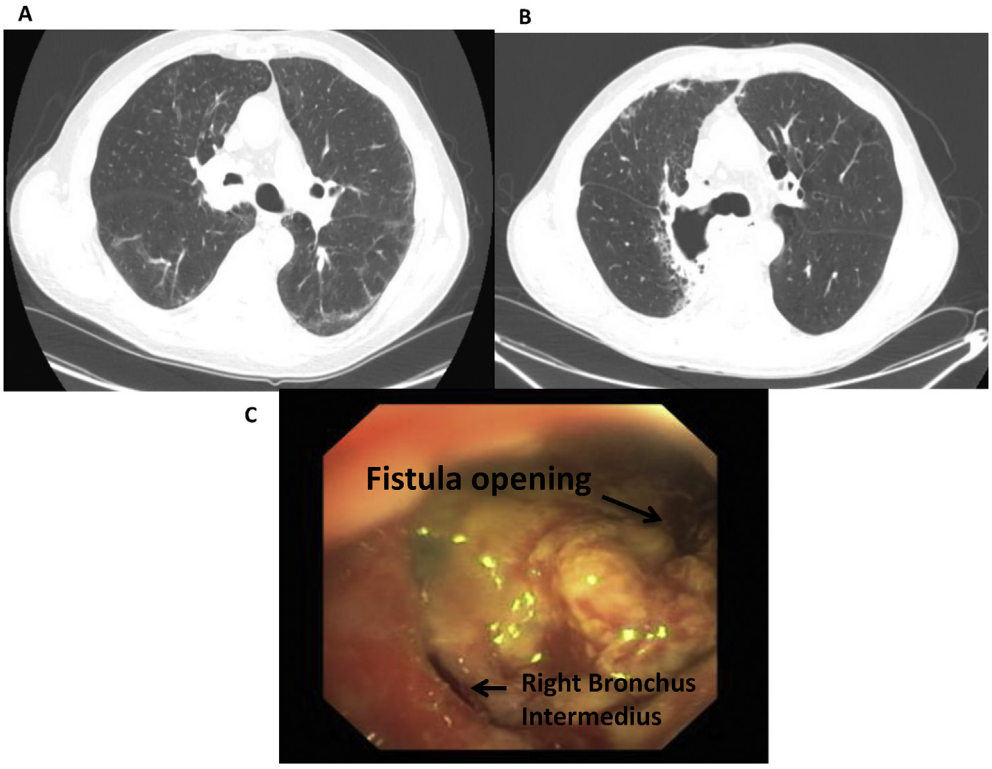

Fig. 1. Computed tomography scan of the chest showing a 3.2 × 3.3 cm hilar mass with endo-bronchial extension, narrowing the right main bronchus (A). Computed tomography scan of the chest showing a thick walled cavity in the right upper lobe with tracheo-parenchymal fistula just above the right upper lobe bronchus (B). Bronchoscopy revealed a tracheoparenchymal fistula connecting the right main bronchus to a large cavity in the right upper lobe, destroying majority of the right main bronchus and causing significant attenuation of the bronchus intermedius (C).

represent the true invasion by the tumor and response to CCRT. The staphylococcus infection may also have played significant role in the cavity and fistula formation.

Risk factors associated with bronchial tree fistulization include, a) high dose radiotherapy, b) tumor type, particularly squamous cell cancer, c) superimposed infection, d) use of anti-angiogenic factors like Bevacizumab [6–8]. Our patient had three of these high risk factors.

The size of the fistula and the dimensions of the cavity highlight the importance of recognition and understanding of this process by trainees.

3. Conclusion

Clinicians should be aware about the risk of tumor cavitation and fistulization associated with CCRT when used for NSCLC, even in the absence of Bevacizumab. Tumor cavitation usually represents treatment response, however a fistula formation into blood vessels or superimposed infections may have ominous some times fatal connotation for the patient.

References

[1] A. Price, Emerging developments of chemoradiotherapy in stage III NSCLC, Nat. Rev. Clin. Oncol. 9 (2012) 591–598.
[2] F.C. Detterbeck, S.Z. Lewis, R. Diekemper, et al., Executive summary: diagnosis and management of lung cancer, 3rd ed: American college of chest physicians evidence-based clinical practice guidelines, CHEST J. 143 (Suppl. 5) (2013) 7S–37S.
[3] A. Aupérin, C. Le Péchoux, E. Rolland, et al., Meta-analysis of concomitant versus sequential radiochemotherapy in locally advanced non-small-cell lung cancer, J. Clin. Oncol. 28 (2010) 2181–2190.
[4] S.I. Jalal, H.D. Riggs, A. Melnyk, et al., Updated survival and outcomes for older adults with inoperable stage III non-small-cell lung cancer treated with cisplatin, etoposide, and concurrent chest radiation with or without consolidation docetaxel: analysis of a phase III trial from the Hoosier O, Ann. Oncol. 23 (7) (2012) 1730–1738.
[5] C.B. Lee, T.E. Stinchcombe, D.T. Moore, et al., Late complications of high-dose (>/=66 Gy) thoracic conformal radiation therapy in combined modality trials in unresectable stage III non-small cell lung cancer, J. Thorac. Oncol. 4 (2009) 74–79.
[6] E.C. Phernambucq, K. Hartemink, E.F. Smit, et al., Tumor cavitation in patients with stage III non-small-cell lung cancer undergoing concurrent chemo-radiotherapy: incidence and outcomes, J. Thorac. Oncol. 7 (2012) 1271–1275.
[7] M.S. Machuzak, J.F. Santacruz, W. Jaber, et al., Malignant tracheal-mediastinal-parenchymal-pleural fistula after chemoradiation plus bevacizumab management with a Y-silicone stent inside a metallic covered stent, J. Bronchol. Interv. Pulmonol. 22 (2015) 85–89.
[8] H. Chow, A. Jung, J. Talbott, et al., Tumor fistulization associated with targeted therapy: computed tomographic findings and clinical consequences, J. Comput. Assisted Tomogr. 35 (2011) 86–90.
[9] J. McCarthy, J. Hamel, Tracheal-mediastinal fistula post-chemoradiation therapy, West. J. Emerg. Med. 15 (7) (2014) 876–877.
[10] C. Choudhary, T.R. Gildea, R. Salman, et al., Management of tracheomediastinal fistula using self-expanding metallic stents, Ann. Thorac. Surg. 85 (2008) 1800–1802.