Dysphagia after Lung Transplant: Consider Aberrant Right Subclavian Artery

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Abstract

Dysphagia is a common presenting symptom in lung transplant patients, especially post-operatively. Lot of emphasis is laid on them passing a swallow test before resuming oral diet. Some cases are intrinsically linked to the associated condition such as scleroderma while others present with reflux and dysmotility or gastroparesis. Sometimes there might be an anatomical condition which might lurk in the shadows as we tend to generalize these complaints. In this context we present this case with an aberrant right subclavian artery compressing the esophagus and compounding the dysphagia. With the proper diagnostic imaging techniques, the medical team and surgical team were able to successfully come to the appropriate diagnosis

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Dysphagia is a common presenting symptom in lung transplant patients, especially post-operatively. Lot of emphasis is laid on them passing a swallow test before resuming oral diet. Some cases are intrinsically linked to the associated condition such as scleroderma while others present with reflux and dysmotility or gastroparesis. Sometimes there might be an anatomical condition which might lurk in the shadows as we tend to generalize these complaints. In this context we present this case with an aberrant right subclavian artery compressing the esophagus and compounding the dysphagia. With the proper diagnostic imaging techniques, the medical team and surgical team were able to successfully come to the appropriate diagnosis.

Introduction:

Vascular rings are a rare congenital problem that tend to present themselves in the pediatric patient population. Although several variations of vascular ring anomalies exist, all the complications have similar manifestations- mostly involving esophageal or tracheal complications such as dysphagia, dyspepsia, recurrent upper respiratory tract infections, or unremitting cough[1]. In this report we present a patient whose esophageal symptoms seemed to have been dormant for many years until they were unmasked later in life. The symptoms prompted further radiography revealing an aberrant right subclavian artery[2]. This case was a diagnostic mystery because although there may be many causes of dyspepsia and dysphagia, a vascular ring should be included in the differential diagnosis. What the mind does not know the eyes cannot see!

Case Report:

A 69 year-old woman with a PMH of Chagas Disease, scleroderma associated ILD, moderate pulmonary hypertension, Type 2 Diabetes Mellitus, Hypothyroidism, underwent a single right lung transplant. After transplantation she was noted to have an uncomplicated course and was discharged home on post-operative day 10 to an acute rehabilitation facility. Two months post lung transplantation the patient was noted

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to have severe dyspepsia, dysphagia, and esophageal reflux. Therefore, the patient was unable to tolerate regular oral intake.

A nuclear medicine study revealed moderately delayed gastric emptying of solids at 2 and 4 hours, with 82% and 46% of radionucleotide label remaining in the stomach respectively. Upon review of thoracic imaging, an aberrant right subclavian artery was noted to arise from the aorta and traverse posterior to the esophagus indenting the esophagus and creating a vascular ring. This aberrant right subclavian artery is believed to have been compressing the esophagus, resulting in functional stenosis of the esophagus. The patient failed to respond to prokinetic and antiemetic pharmacologic therapy. She was therefore treated by insertion of a percutaneous endoscopic gastric-jejunal tube. This allowed enough nutrition to be provided distal to all known pathologic processes in the enteric tract.

Discussion:

While there are certainly multiple confounding factors, the discovery of the aberrant subclavian artery is a unique anatomic variant that contributed to cause the confluence of symptoms resulting in the patient's inability to tolerate food or drink[3]. History of Chagas disease and scleroderma which are both known to cause esophageal abnormalities also may have contributed[4]. These structural variants and pathology represent a unique presentation that has not been described in lung transplant recipients.

Diagnostic radiography threw more light onto the patient's mysterious esophageal abnormalities. As seen in Figure 1, there's a fourth branch coming off the original aortic arch- a contrast to the normal anatomy where only 3 branches come off. The 3D reconstructed CT scan showed that the fourth branch takes a sharp turn and dives medially to travel posterior to the esophagus to do the regular job of the right subclavian artery.

This anomalous route that the subclavian artery takes is also seen in the axial cross section of the thorax shown in Figure 3. The radiolucent structure in the scan is the right subclavian artery traversing posterior to the esophagus. This image along with the sagittal image in Figure 4 seems to be radiologic evidence that the aberrant subclavian artery is impinging on the esophagus. In Figure 5, the coronal slice shows that the aberrant subclavian artery posterior to the esophagus seems to be near the level of the tracheal bifurcation- at vertebral level T4. Lastly, a bariums swallow study conducted as shown in Figure 6 confirms that there is an impingement in the normal tubular structure of the esophagus thus further driving home the point that the right subclavian artery's unnatural route is a root cause for the patient's symptoms.

This case is of specific interest because even though there may be other reasons for dysphagia a differential diagnosis of vascular ring should be entertained.

Figure 1: A Posterior view reconstruction of CT at level of aortic arch. Esophagus is shown in red with aberrant right subclavian artery shown wrapping around the esophagus and compressing it.

Figure 2: A left lateral view reconstruction of CT at level of aortic arch. Esophagus is shown in red with aberrant right subclavian artery shown wrapping around the esophagus and compressing it.

Figure 3: Axial cross-section of thorax. Posterior to the trachea is the compressed esophagus with the aberrant right subclavian artery seen posterior to the esophagus.

Figure 4: Labelled sagittal cross section of the thorax showing posterior aberrant right subclavian artery compressing the esophagus against the trachea.

Figure 5: Coronal image demonstrating the esophagus being impinged by the aberrant right subclavian artery.

Figure 6: Modified barium Swallow showing esophageal indentation

References

1. Backer CL, Mongé MC, Popescu AR, Eltayeb OM, Rastatter JC, Rigsby CK. Vascular rings. *Semin Pediatr Surg* . 2016;25(3):165–175. doi:10.1053/j.sempedsurg.2016.02.009

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2. Polguj M, Chrzanowski Ł, Kasprzak JD, Stefańczyk L, Topol M, Majos A. The aberrant right subclavian artery (arteria lusoria): the morphological and clinical aspects of one of the most important variations–a systematic study of 141 reports. *ScientificWorldJournal* . 2014;2014:292-734. doi:10.1155/2014/292734
3. Carucci LR, Turner MA. Dysphagia revisited: common and unusual causes. *Radiographics* . 2015;35(1):105–122. doi:10.1148/rg.351130150
4. Roure S, Valerio L, Vallès X, et al. Oesophageal motility disorders in infected immigrants with Chagas disease in a non-endemic European area. *United European Gastroenterol J* . 2016;4(4):614–620. doi:10.1177/2050640616630856

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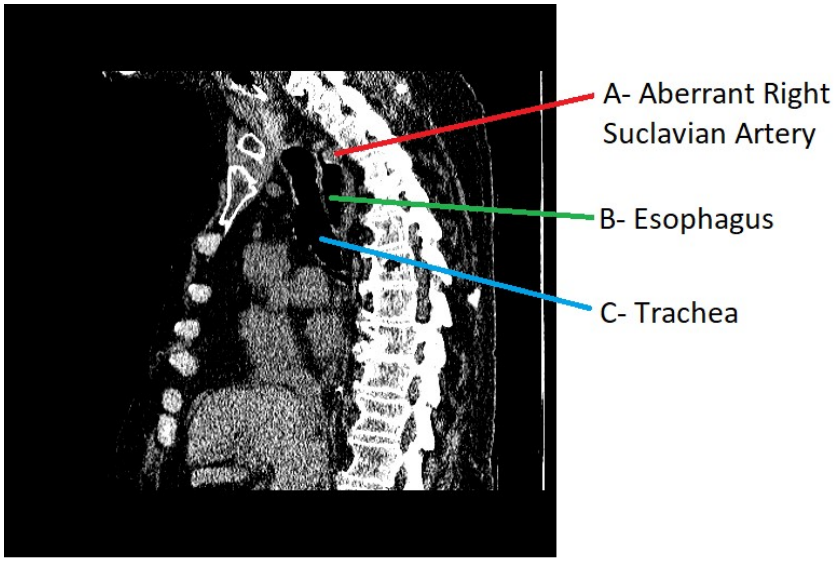

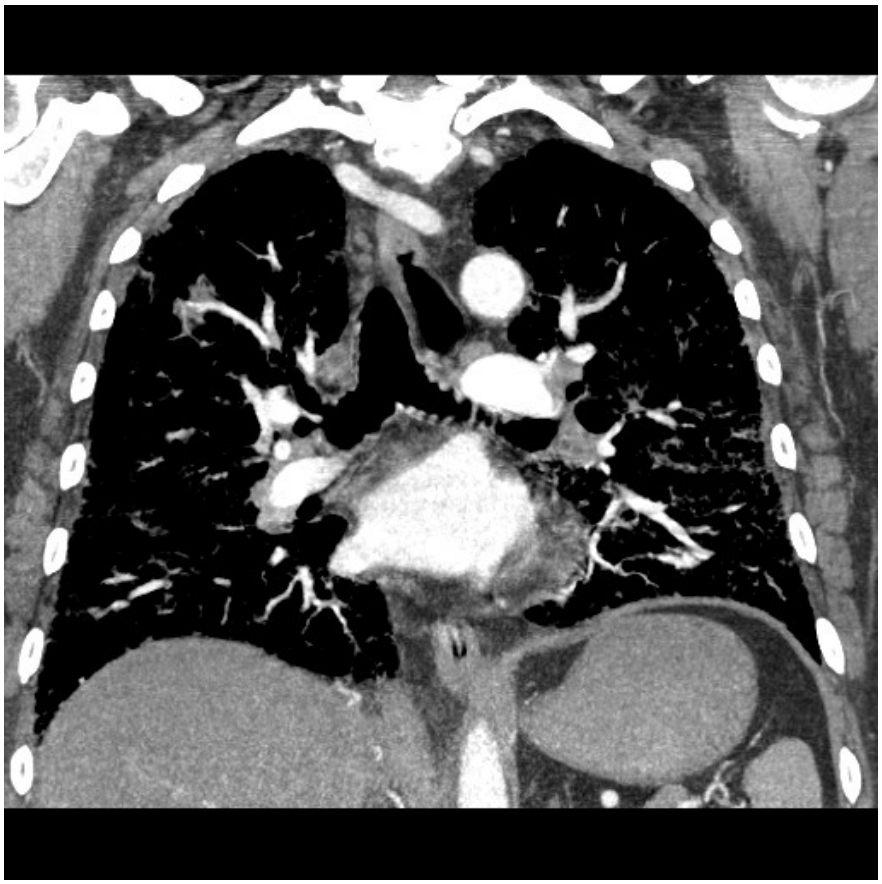

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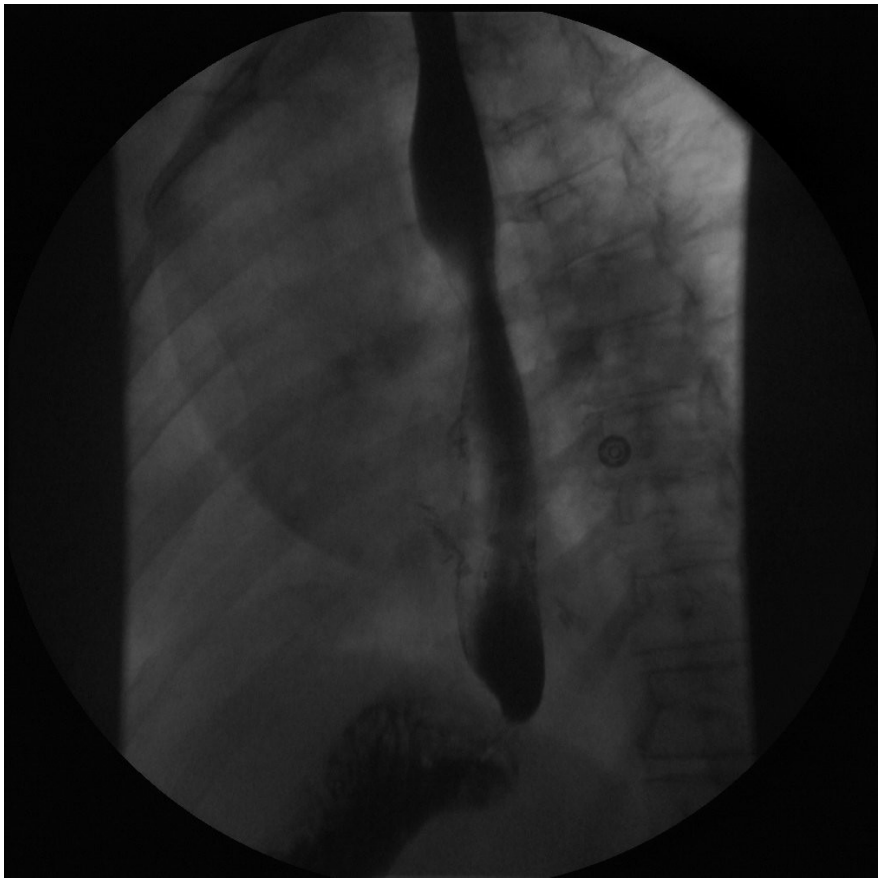

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