

## ABERRANT RIGHT SUBCLAVIAN ARTERY (ARTERIA LUSORIA): A CASE OF ASYMPTOMATIC RUPTURE

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### ABSTRACT

A 65-year-old male patient was referred to our hospital for sudden onset of shortness of breath and chest pain. His medical history had an abdominal aortic aneurysm about six years ago. His vital findings were normal. Laboratory findings showed leucocytosis (white blood cell count was 12 000/mm<sup>3</sup>, haemoglobin was 14.5gr/dl, and C-reactive protein value was 15 mg/dl). About four hours after the admittance to the hospital, ecchymosis occurred on his anterior neck region. The patient reported no discomfort on swallowing and did not have any history of previous important chest trauma or injury. A ruptured aberrant right subclavian artery (ARSA) was demonstrated by computed tomography-angiography and magnetic resonance angiography. To the best of our knowledge, this is the first case report of a patient presenting with ecchymosis on anterior neck region with acute onset due to the ruptured ARSA.

**Key-Words:** Aberrant Subclavian Artery; Arteria Lusoria; Rupture

### Introduction

Aberrant right subclavian artery (ARSA) is also called as a lusorian artery that is extremely rare.<sup>[1]</sup> However, it is amongst the most common aortic arch anatomic anomalies.<sup>[2]</sup> The incidence of ARSA in the general population is in the range between 0.1–2.3%.<sup>[1,2]</sup> It emerges as fourth branch of the proximal descending aorta.<sup>[3]</sup> Clinically, many patients with ARSA are asymptomatic. However, dysphagia, shortness of breath, and chest pain may be the first symptoms because of compression. ARSA are tend to rupture. In acute ruptured ARSA cases, the mortality rate is reported as high as 50%.<sup>[4]</sup> Therefore, it should be electively repaired as soon as it was discovered. It can be diagnosed by a barium esophagram or upper endoscopy, showing a pulsating compression of the posterior wall<sup>[5,6]</sup>, or by imaging of the aortic arch with computed tomography (CT) angiography or magnetic resonance (MR) angiography.<sup>[7]</sup> We present a patient admitting at emergency room with shortness of breath caused by ruptured ARSA.

### Case Report

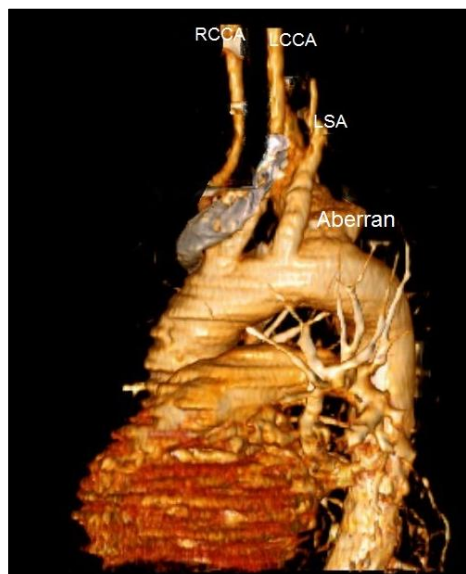
A 65-year-old male patient was referred to our hospital for sudden onset of shortness of breath and chest pain. In the initial examination, the physical findings were normal. He was in severe respiratory distress. His medical history had an abdominal aortic aneurysm about six years ago. He had been a smoker of 1 pack of cigarettes per day.



**Figure-1A: Postcontrast Computed Tomography - Angiography Axial Image** [Hematoma (H), Body of Vertebra (V), Right Common Carotid (RCC), Left Common Carotid (LCC), Trachea (T), with Aberrant Right Subclavian Artery (Aberran)]

In addition, the patient reported no discomfort on swallowing and did not had any history of previous important chest trauma or injury. His blood pressure was 135/75 mmHg both in the right and left arms. Routine chest X-ray was nonspecific. His heart rate was 99 beats/min and oxygen saturation was 96%. Laboratory findings showed (white blood cell count: 12 000/mm<sup>3</sup>, the haemoglobin was 14.5 gm/dl, and C-reactive protein value was 15 mg/dl). About four hours after the admittance to the hospital, ecchymosis occurred on his anterior neck region. The ruptured ARSA were demonstrated by CT-angiography and MR-angiography (figure 1A & 1B). MR revealed hematoma around the ARSA (Figure 2). We offered an operation for the patient, but the patient

rejected because of his operation fear.



**Figure-1B: Computed Tomography – Angiography** [Aberrant Right Subclavian Artery (Aberran), Left Subclavian Artery (LSA), Left Common Carotid Artery (LCCA), Right Common Carotid Artery (RCCA)]



**Figure-2: Magnetic Resonance T2A Sagittal Image** [Hematoma (H), Trachea (T) with Aberrant Right Subclavian Artery (Aberran)]

## Discussion

In 80% of the cases ARSA crosses between esophagus and vertebral column, in 15%, between esophagus and trachea, and in 5% of the cases, anterior to trachea and esophagus.<sup>[8]</sup> In our case, ARSA was passing between the esophagus and vertebral column. The most common symptom in such patients is dysphagia because of the compression of the ARSA or the hematoma. However, the patient didn't have any complaints about dysphagia.

There are several treatment options for an ARSA. One of them is conventional surgery. The mortality rate of conventional surgical repair in ARSA patients has a range

between 18% and 25%.<sup>[9]</sup> The method proposed by Kieffer et al.<sup>[10]</sup> is posterolateral thoracotomy for ligation and repair of ARSA origin involving reconstruction of the right subclavian artery. They reported that the right subclavian artery can be achieved by transposing the distal ARSA onto the ipsilateral common carotid through a cervical incision. Moreover, they reported that 10 patient died in a study that included 33 patients with ARSA. Tochii et al. reconstructed the ARSA in the normal position to avoid the compression of the esophagus and trachea.<sup>[11]</sup> Furthermore, median sternotomy can be preferred for easier exposure of the neck vessels, for simultaneous surgical treatment of the coronary or valve lesion, and for the repair of distal arch aneurysm without Kommerell's diverticulum.<sup>[4]</sup>

Endovascular treatment and hybrid approach are amongst other options as alternates to surgery. Lacroix et al.<sup>[12]</sup> claimed that hybrid treatment for ARSA patients was feasible, safe, and effective. Hybrid approach in that the ARSA is occluded distal to the aneurysm combined with a covered stent at the origin of the aorta is advised in recent literature, even in acute settings.<sup>[13,14]</sup> After that, revascularization of the right arm by a bypass or re-implantation may be obtained by using an carotico-subclavian bypass via a right supraclavicular incision. When our patient didn't accept an open surgery, we offered an endovascular hybrid treatment option, but he also rejected it and he was discharged through his own decisions.

A study by Austin et al.<sup>[4]</sup> showed that rupture of the aneurysm occurred in six of 31 patients with aneurysms of the ARSA, and it was reported that all of whom subsequently died. A research performing by Kopp et al.<sup>[15]</sup> demonstrated that a pre- and intra-operative rupture rate of 22.6% associated with a mortality rate of 100%, both of which were independent from the aneurysm diameter.<sup>[16]</sup> Some authors have also reported hemorrhagic shock caused by rupture of ARSA.<sup>[17]</sup> In our case, the patient with ruptured ARSA was quite well in his general condition, and the patient was still healthy at the time he was leaving.

In the literature, it was reported that the coincidence of ARSA aneurysm and an abdominal aortic aneurysm (AAA) were between 10% and 20%.<sup>[18]</sup> Kopp et al.<sup>[15]</sup> reported that three of four patients with an ARSA aneurysm underwent additional operative treatment for their AAA. When our patient were operated about six years ago, ARSA had overlooked. Therefore, we think that the patients with AAA should have continuous screening for ARSA or other arcus aorta anomalies.

## Conclusion

In conclusion, treatment of a non-aneurysmal or ruptured ARSA depends on patient's status, anatomical relationship to neighbouring organs, characteristics of the lesion within the ARSA, and complaints of the patient. An endovascular approach may be preferred in cases of high-risk and in cases of rejecting the open conventional surgery. However, open surgery using a bypass or re-implantation is inevitable in young healthy patients that accept open conventional surgery. To the best of our knowledge, this is the first case report of a patient presenting with ecchymosis on anterior neck region with acute onset due to the ruptured ARSA.

## References

- Boening A, Dresler C, Haverich A, Cremer J. Two-stage repair of a combined aneurysm of the descending aorta and the aberrant right subclavian artery. *Eur J Cardiothorac Surg.* 1999;16:246–8.
- Turkenburg JL, Versteegh MI, Shaw PC. Case report: aneurysm of an aberrant right subclavian artery diagnosed with MR imaging. *Clin Radiol.* 1994;49:837–9.
- Levitt B, Richter JE. Dysphagia lusoria: A comprehensive review. *Dis Esophagus* 2007; 20: 455–460.
- Austin EH, Wolfe WG. Aneurysm of aberrant subclavian artery with a review of the literature. *J Vasc Surg.* 1985;2(4):571–577.
- Stagias JG, Ciarolla D, Campo S, Burrell MI, Traube M. Vascular compression of the esophagus: A manometric and radiologic study. *Dig Dis Sci.* 1994; 39: 782–786.
- Cappell MS. Endoscopic, radiographic, and manometric findings associated with cardiovascular dysphagia. *Dig Dis Sci.* 1995; 40: 166–176.
- Alper F, Akgun M, Kantarci M, et al. Demonstration of vascular abnormalities compressing esophagus by MDCT: Special focus on dysphagia lusoria. *Eur J Radiol.* 2006; 59: 82–87.
- Levitt B, Richter JE. Dysphagia lusoria: A comprehensive review. *Dis Esophagus* 2007; 20: 455–460.
- Esposito RA, Khalil I, Galloway AC, Spencer FC. Surgical treatment for aneurysm of aberrant subclavian artery based on a case report and a review of the literature. *J Thorac Cardiovasc Surg.* 1988;95(5):888–891.
- Kieffer E, Bahnini A, Koskas F (1994) Aberrant subclavian artery: surgical treatment in thirty-three adult patients. *J Vasc Surg.* 19:100–109
- Munakata M, Itaya H, Fukui K, Ono M. One-stage repair for aortic regurgitation and Kommerell diverticulum with aneurysmal right aortic arch. *J Thorac Cardiovasc Surg.* 2007;133(3):798–9.
- Lacroix V, Astarci P, Philippe D, et al. Endovascular treatment of an aneurysmal aberrant right subclavian artery. *J Endovasc Ther.* 2003;10:190-194.
- Lee CY, Moraca RJ, Benckart DH, Bailey SH, Magovern Jr GJ, Muluk S. Thoracic endovascular aortic repair of an aberrant right subclavian artery: technique and long-term outcome. *J Card Surg.* 2010;25:390–3.
- Bosma J, van Swijndregt AD, Vahl AC. Hybrid treatment of a ruptured diverticulum of Kommerell. *J Endovasc Ther.* 2010;17(6):762–6.
- Kopp R, Wizgall I, Kreuzer E, Meimarakis G, Weidenhagen R, Kühnl A, et al. Surgical and endovascular treatment of symptomatic aberrant right subclavian artery (arteria lusoria). *Vascular.* 2007;15(2):84-91.
- Jauch KW, Riel KA, Lauterjung L, Berger H. Aneurysm of tlic arteria lusoria. Case report and review of the literature. *Chirurg.* 1988;59:418-24.
- Kiernan PD, Dearani J, Byme WD, Ehrlich T, Carter W, Krasicky G, et al. Aneurysm of an aberrant right subclavian artery: case report and review of the literature. *Mayo Clin Proc.* 1993;68(5):468–74.
- Janssen M, Baggen MG, Veen HF, Smout AJ, Bekkers JA, Jonkman JG, et al. Dysphagia lusoria; clinical aspects, manometric findings, diagnosis, and therapy. *Am J Gastroenterol.* 2000;95(6):1411-6.

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