

## Aberrant Left Subclavian Artery Associated with Kommerell's Diverticulum

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### Abstract

Kommerell diverticulum (KD) with left aberrant subclavian artery is a rare congenital variation of vascular structure, and it can be asymptomatic or symptomatic owing to mass effect. Surgical intervention is recommended in symptomatic patients or asymptomatic patients with a large diverticulum because of possible dissection and rupture of Kommerell diverticulum. We report a case of right-sided aorta, KD, and left aberrant subclavian artery in a 74-year-old man. He had no symptoms with KD.

**Keywords:** Adult; Aneurysm; Aorta; Computed Tomography

### Introduction

Kommerell's diverticulum (KD) with left aberrant subclavian artery is a rare congenital variation of vascular structure, and it can be asymptomatic or symptomatic owing to mass effect. Surgical intervention is recommended in symptomatic patients or asymptomatic patients with a large diverticulum because of possible dissection and rupture of KD. We report a case of right-sided aorta, KD, and left aberrant subclavian artery in a 74-year-old man. He had no symptom with KD.

### Case Report

A 74-year-old man was admitted to hospital two weeks ago on cerebral infarction. He has been transported to our hospital by acute arterial occlusive disease in his lower limb.

Although stroke and cause of lower extremity arterial occlusive seemed a thrombus by dehydration and atrial fibrillation, it was not recognized intracardiac thrombus at the time of admission. Thrombectomy was performed in emergency.

Computed axial tomography of the thorax confirmed the existence of a right aortic arch with an aberrant left subclavian artery originated from the KD. It was Saccular aneurysm and 27mm in diameter (Figure 1). Echo cardiograph showed severe mitral regurgitation and congestive heart failure. There were no symptoms such as dysphagia related to the aortic arch anomaly.

Mitral valve plasty and ascending aorta to right subclavian artery bypass was preformed after 2 weeks from admission. Ascending aorta to right subclavian artery bypass was performed because of the preparation for endovascular therapy for KD. Since the rehabilitation from cerebral infarction was favorable, he chose open graft replacement technique.

The operation for KD was performed after 6 weeks from admission to our hospital. Extra-anatomic right subclavian to left subclavian

bypass was performed before the intrathoracic procedure. Subsequently, a right third intercostal thoracotomy provided adequate exposure for repairing the aortic aneurysm and over-sewing the aneurysmal origin of the subclavian artery. Cardiopulmonary bypass was established with cannulation to the femoral vein and the femoral artery. Graft replacement for aneurysm with aorta clamp and closure of left subclavian artery without use of hypothermic circulatory arrest was performed. His postoperative course was uneventful with no neurologic deficits (Figure 2).

The patient consented to the publication of this case report.

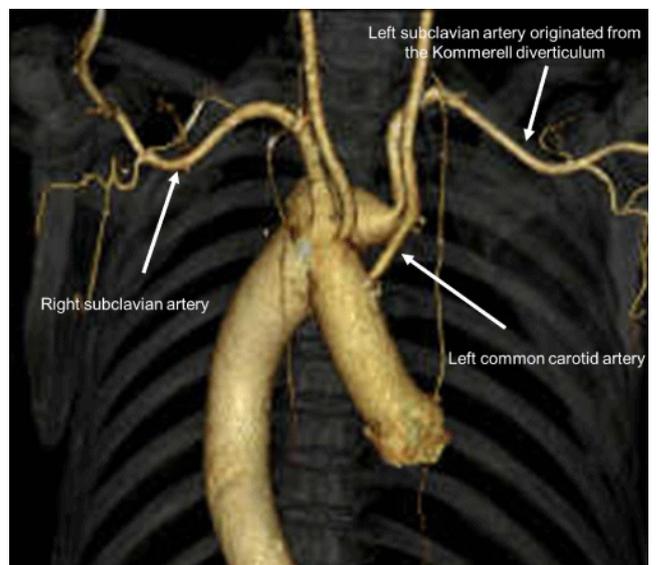
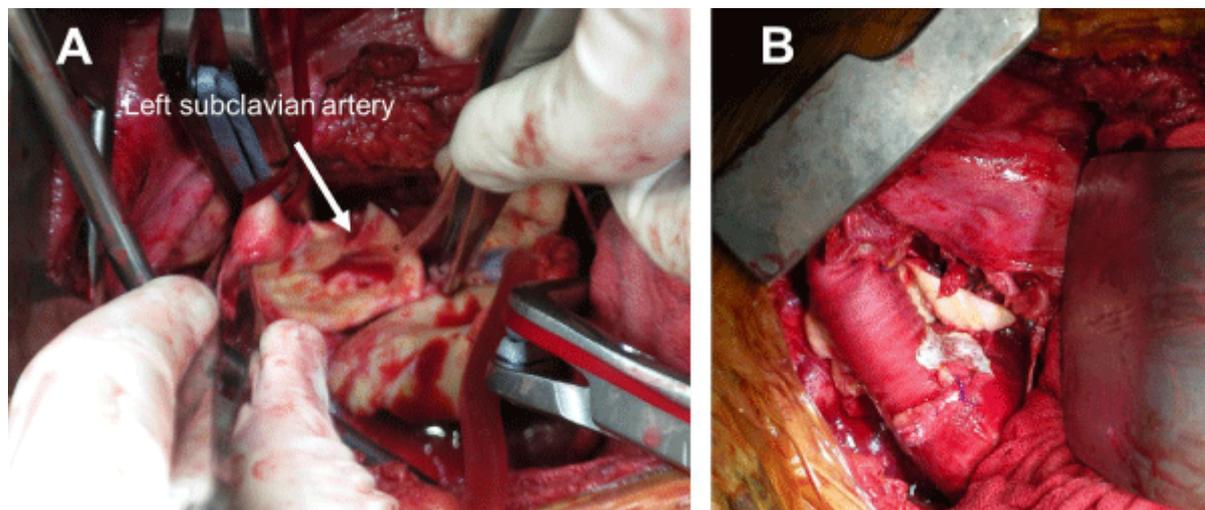
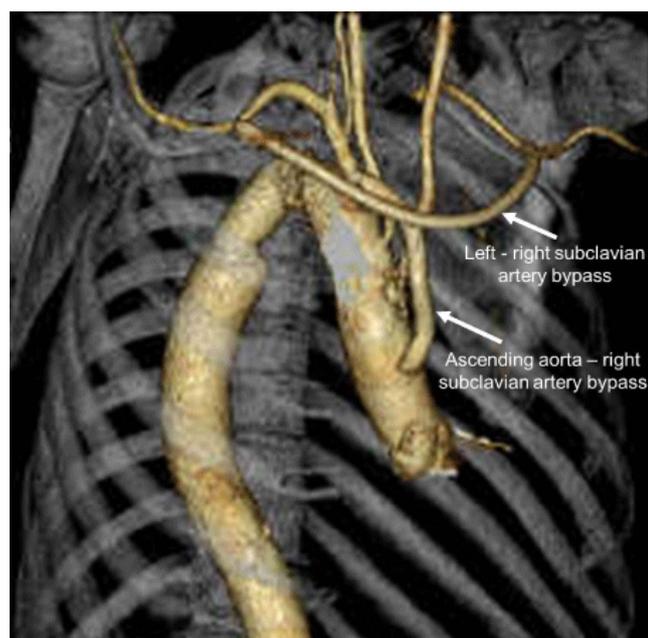


Figure 1: Pre-operative computed tomography.



**Figure 2:** Intraoperative view: (A) Orifice of the left subclavian artery; (B) Replacement of the Kommerell diverticulum by a prosthetic vessel.



**Figure 3:** Post-operative computed tomography.

## Discussion

Right-sided aorta is present in 0.04% to 0.1% of the population, and 50% of right-sided aortic arches are associated with an aberrant left subclavian artery. KD is aneurysmal dilatation at the beginning of an aberrant subclavian artery. KD and aberrant subclavian artery can be discovered accidentally in asymptomatic children or adults, but sometimes they are associated with complications, such as compression of adjacent structures, dissections, or ruptures.

The natural history of KD is uncertain, owing to its rarity. Surgical treatment is recommended to avoid the possibility of rupture and endovascular treatment has also become an option [1,2]. The size above which surgical intervention should be recommended in asymptomatic or mildly symptomatic patients is not clearly established. Cinà and colleagues recommended surgical treatment for aneurysms 3 cm or greater in diameter [2].

Various approaches for the operation have been described. These include transposition or bypass of the distal portion of the aberrant artery into the adjacent carotid artery with or without ligation of the aberrant artery proximally, exclusion of the aneurysmal segment, and resection of the origin of the aneurysm from the descending thoracic aorta [1-3]. Additional techniques include thoracotomy to replace aneurysmal segments of the descending thoracic aorta with or without use of partial or total cardiopulmonary bypass, hypothermia, and circulatory arrest [2,3]. Endovascular grafting has also been employed [4]. Careful consideration of the individual anatomy of the aortic arch and cerebral arteries is essential to a successful outcome after surgical or endovascular treatment.

In this case, we have decided to reconstruct the left subclavian artery as an extrathoracic procedure. We have considered that the left subclavian artery reconstruction was difficult, because the orifice was so far from the right side chest wall. Graft replacement for aneurysm with aorta clamp and closure of left subclavian artery without use of hypothermic circulatory arrest was performed to avoid cerebral ischemia. Endovascular grafting was not selected, because long-term result has not been determined.

## Conclusion

Performing subclavian reconstruction as an extrathoracic procedure before the intrathoracic repair would be expected to reduce the subsequent risk of distal ischemia or subclavian steal without increasing the overall morbidity associated with the procedure.

## Conflicts of Interest

No competing interest declared

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## References

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