



## Direct Reimplantation of a Transected Coronary Artery in Acute Type A Aortic Dissection

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### Abstract

A 52-year-old male patient was admitted for acute type A aortic dissection. Circumferential detachment of the Right Coronary Artery (RCA) ostium was detected intraoperatively. The proximal RCA was dissected, the intimal RCA was circumferentially detached with inner intussusception, and only adventitia was partially connected to the aortic root. Instead of performing coronary artery bypass grafting surgery to the RCA, direct RCA implantation to the Valsalva ascending graft was performed after repairing the dissected lumen of the proximal RCA. Cardiopulmonary bypass weaning was smooth, and no complications related to the RCA were observed.

**Keywords:** Aorta; Aortic dissection; Acute aortic syndrome

### Introduction

Retrograde aortic root dissection toward the coronary ostium is uncommon. However, acute myocardial ischemia is a potentially fatal condition in this situation, and repairing dissected coronary arteries to prevent myocardial malperfusion is very important. In this case, we repaired dissected Right Coronary Artery (RCA) ostium and directly reimplanted it to the aortic root rather than Coronary Artery Bypass Grafting (CABG).

### Materials and Methods

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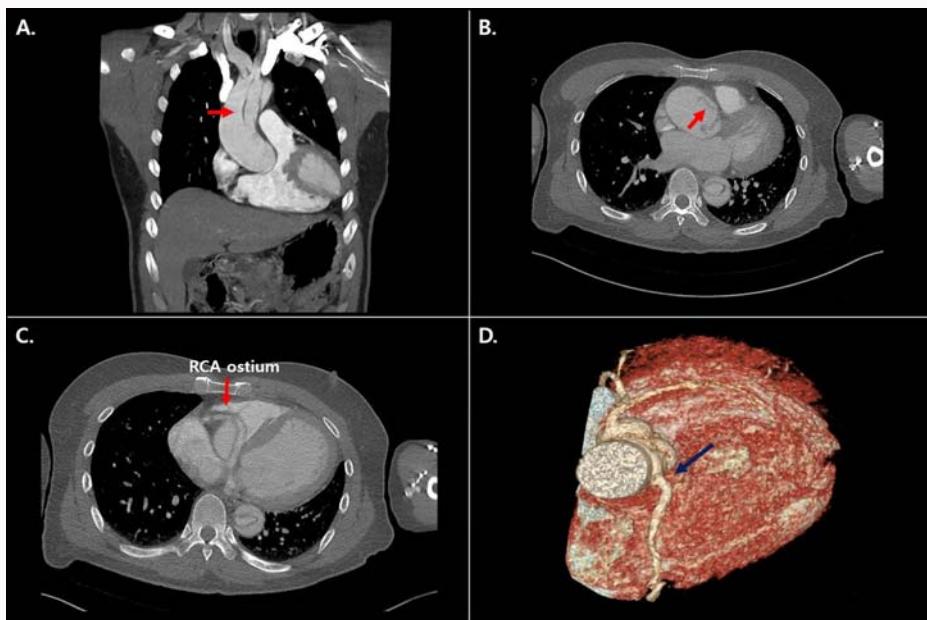
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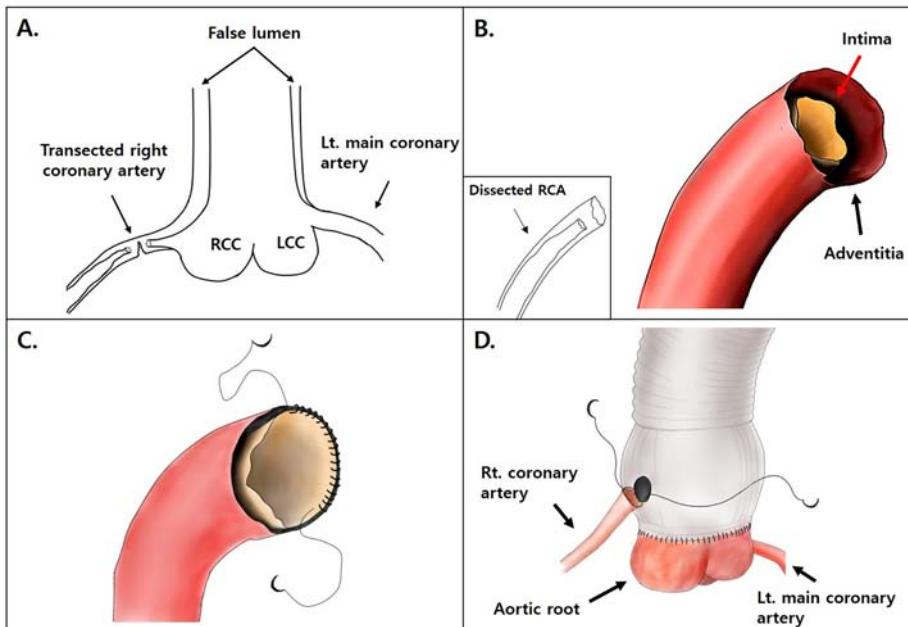
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**Figure 1:** A-C) Preoperative computed tomography scan findings. Red arrows indicate the aortic flap; D) postoperative computed tomography scan findings. The blue arrow indicates an intact right coronary artery ostium without stenosis. (RCA: Right Coronary Artery).



**Figure 2:** Acute type A aortic dissection involving Right Coronary Artery (RCA). A) Aortic dissection involved RCA ostium and RCA were transected; B) transected right coronary artery ostium; C) careful mobilization around dissected layers and then conjoined with reinforced over-and-over continuous suture; D) direct RCS ostium anastomosis to Valsalva graft. (LCC: Left Coronary Cusp; RCC: Right Coronary Cusp).

## Discussion

Although retrograde aortic root dissection toward the coronary ostium is relatively uncommon, the incidence of coronary malperfusion in acute type A aortic dissection is reported to range from 5.7% to 11.3% [1,2] with a high mortality rate [3]. However, surgical outcomes depend on the degrees of myocardial damage, intraoperative appropriate coronary revascularization, and postoperative management for low cardiac output. Coronary malperfusion by acute type A aortic dissection may not be easily detected even intraoperatively. Moreover, the degrees of coronary

malperfusion, including the location and size, the existence of reentry, and the flow pattern may affect the onset and severity of coronary malperfusion [4]. In this patient, the RCA ostium transection was not detected in preoperative CT, and no evidence of myocardial injury was observed preoperatively. Furthermore, no cardioplegia injection complications were encountered intraoperatively.

This study showed that direct reimplantation of the transected coronary artery to the aortic graft in acute type A aortic dissection is a feasible option. Neri et al. [3] distinguished three main types of lesions based on the dissection flap extension within the coronary artery in

widely varied situations, i.e., from the isolated ostial dissection to the circumferential detachment with inner intussusception; this case was classified as type C (circumferential detachment with an inner cylindrical intussusception). CABG could be a treatment option for this type; however, it should only be considered as a rescue procedure for competitive flow and coronary re-dissection risk with complete graft-dependent perfusion of large myocardial territories [3]. Considering the long-term patency of the vein graft on CABG, coronary reattachment after the repair is the first treatment option. The transected RCA ostial tissue was very friable but showed a relatively dense appearance after an over-and-over reinforcing suture surrounding the RCA ostium with careful tissue mobilization sufficient to reimplant the aortic graft. Furthermore, the Valsalva graft was used to shorten the distance between the transected RCA ostium and graft to reduce coronary tension. Cabrol procedure [5], use of a semicircular hood pericardial patch [6], or saphenous vein reconstruction [3] can also address coronary tension. However, in this case, the Valsalva graft was a better option because it can sufficiently shorten the distance between the transected RCA ostium and graft without requiring additional anastomosis time as compared to other options.

In summary, direct reimplantation of the transected coronary artery using Valsalva graft in acute type A aortic dissection can be performed in selected patients and is expected to have good long-term surgical outcomes.

## References

1. Waterford SD, Di Eusanio M, Ehrlich MP, Reece TB, Desai ND, Sundt TM, et al. Postoperative myocardial infarction in acute type A aortic dissection: A report from the International Registry of Acute Aortic Dissection. *J Thorac Cardiovasc Surg.* 2017;153(3):521-7.
2. Geirsson A, Szeto WY, Pochettino A, McGarvey ML, Keane MG, Woo YJ, et al. Significance of malperfusion syndromes prior to contemporary surgical repair for acute type A dissection: outcomes and need for additional revascularizations. *Eur J Cardiothorac Surg.* 2007;32(2):255-62.
3. Neri E, Toscano T, Papalia U, Frati G, Massetti M, Capannini G, et al. Proximal aortic dissection with coronary malperfusion: Presentation, management, and outcome. *J Thorac Cardiovasc Surg.* 2001;121(3):552-60.
4. Pêgo-Fernandes PM, Stolf NA, Hervoso CM, Silva JM, Arteaga E, Jatene AD. Management of aortic dissection that involves the right coronary artery. *Cardiovasc Surg.* 1999;7(5):545-8.
5. Kourliouros A, Soni M, Rasoli S, Grapsa J, Nihoyannopoulos P, O'Regan D, et al. Evolution and current applications of the Cabrol procedure and its modifications. *Ann Thorac Surg.* 2011;91(5):1636-41.
6. Westaby S, Katsumata T, Vaccari G. Coronary reimplantation in aortic root replacement: A method to avoid tension. *Ann Thorac Surg.* 1999;67(4):1176-7.