Case Studies

Coronary Subclavian Steal Syndrome Successfully Treated with Subclavian Artery Stenting: A Report of 2 Cases

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Coronary subclavian steal syndrome (CSSS) is a well-recognized phenomenon secondary to coronary artery bypass grafting and may cause myocardial ischemia. We report 2 cases of CSSS successfully treated with subclavian artery (SA) stenting. In both cases, an Optimo balloon guiding catheter was placed in the SA immediately proximal to the vertebral artery (VA) origin as a double protection system for the VA and left internal thoracic artery (LITA) graft. There were no periprocedural complications. Balloon protection for both the VA and LITA using a single balloon guiding catheter is a reasonable and safe technique for preventing distal embolisms. **Key Words:** Coronary subclavian steal syndrome—subclavian artery stenosis—percutaneous transluminal angioplasty—stent placement—balloon protection.

Introduction

Coronary subclavian steal syndrome (CSSS) is defined as coronary ischemia resulting from reversed flow of the internal thoracic artery (ITA) graft secondary to subclavian artery (SA) stenosis after coronary artery bypass grafting (CABG). CSSS is a well-recognized phenomenon secondary to CABG. The incidence rate of CSSS is approximately 2.5 to 4.5%.[1] We report 2 cases of SA stenosis after CABG that radiographically or clinically showed CSSS and were successfully treated with SA stenting.

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Case Presentation

Case 1

A 78-year-old woman with a repeated history of unstable angina underwent CABG with the left internal thoracic artery (LITA) to the left anterior descending artery (LAD) and the radial artery graft to the right circumflex artery 11 years prior. Four years later, percutaneous coronary intervention (PCI) of the left main trunk (LMT) was performed due to the recurrence of unstable angina. At the age of 78, she presented with chest pain. Aortic arch angiography showed occlusion of the radial artery graft and left SA stenosis (Fig 1, A), so PCI of the LMT was conducted. Two months later, she developed acute cardiac failure. Coronary angiography revealed reversed flow in the LITA graft (Fig 1, B). In an electrocardiogram, myocardial ischemia in the anteroseptal area due to CSSS was detected (Fig 2, A). She was brought to our department for treatment of SA stenosis.

Procedure

A 6-Fr Shuttle guiding sheath (Cook Medical Inc., Bloomington, IN, USA) was placed in the aortic arch. A

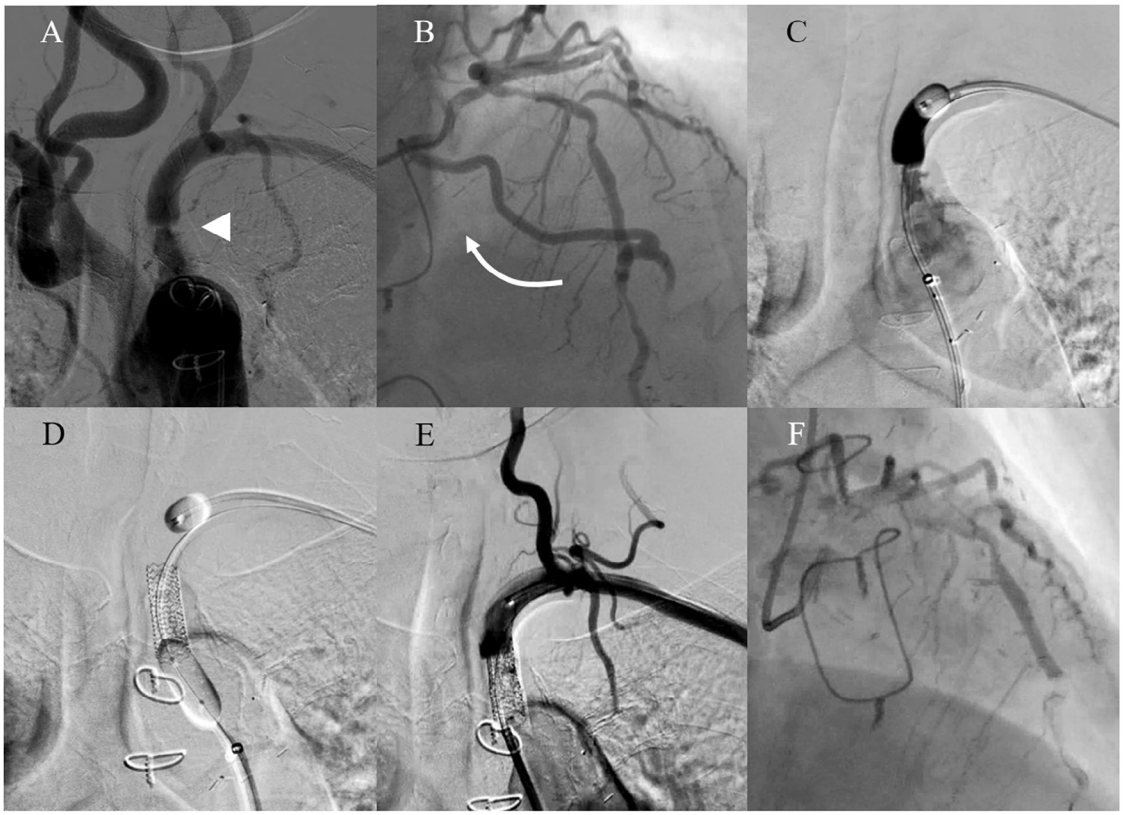

Figure 1. *(A) Aortic arch angiography shows SA stenosis (arrowhead). (B) Coronary angiography reveals the retrograde flow in the LITA graft, suggesting CSSS (curved arrow). (C) The balloon of an Optimo balloon guiding catheter is inflated in the SA immediately proximal to the VA origin to protect both the VA and LITA. (D) The balloon-expandable stent Express 8 mm × 20 mm is deployed, and postdilatation is subsequently performed. (E, F) Final angiography shows ideal dilatation of the stenotic area and anterograde flow in the LITA graft. Abbreviations: CSSS, coronary subclavian steal syndrome; LITA, left internal thoracic artery; SA, subclavian artery; VA, vertebral artery.*

Deja-vu support (300 cm; Cordis Japan, Nagoya, Japan), which was inserted from the left brachial sheath, was lassoed by an Amplatz GooseNeck Snare (ev3, Plymouth, MN, USA) and drawn out of the right femoral sheath, thus forming a pull-through system. An 8-Fr Optimo balloon guiding catheter (Tokai Medical Products, Inc., Aichi, Japan) was placed in the SA immediately proximal to the vertebral artery (VA) origin from the left brachial sheath, and the balloon was then inflated as a double protection system for the VA and LITA graft (Fig 1, C). Predilatation was

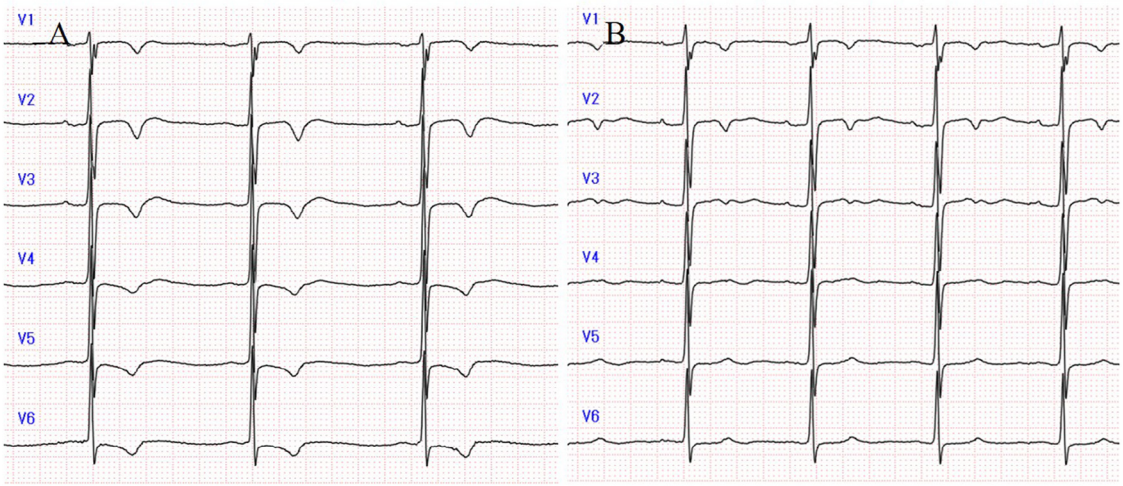

Figure 2. *(A) ECG before the procedure shows ST depression in V2-V6. (B) ECG after the procedure shows the disappearance of ST depression. Abbreviation: ECG, electrocardiogram.*