

Complete Proximal Occlusion of All Three Main Coronary Arteries Complicated With a Left Main Coronary Aneurysm: A Case Report

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Abstract

A 68-year-old woman with recurrent chest pain was referred to our institution. Coronary angiography showed 100% obstruction of the left main trunk, the proximal right coronary artery with good collaterals to the left anterior descending artery and left circumflex artery along the conus artery. Emergency surgical revascularization was undertaken with two saphenous vein grafts. The saphenous vein grafts were placed in the left anterior descending artery, obtuse marginal branch and the posterolateral and posterior descending coronary arteries with excellent flow. The postoperative course was uneventful and follow-up angiography was obtained 20 days after the surgery. Coronary angiography demonstrated a saccular aneurysm (10 × 9 mm) originating at the distal segment of the left main coronary artery with 90% stenosis, and excellent patency of both saphenous vein grafts. Follow-up angiography was performed 1 and 3 years after the surgery. The size of the left main coronary aneurysm remained unchanged at both examinations. The patient did well with no further cardiac symptoms after 5 years.

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Key Words

■Aneurysms (left main coronary aneurysm) ■Cardiac surgery (bypass grafting)
■Coronary artery disease (three-vessel obstruction)

INTRODUCTION

Coronary artery aneurysms are defined as dilations of more than 1.5 times that of the diameter of the adjacent normal coronary segment^{1,2}. The incidence of coronary artery aneurysm on routine angiography in adults ranges from 1 to 5%^{1,3}. Almost all coronary artery aneurysms observed in adults more than 56 years old are caused by atherosclerosis⁴. However, left main coronary aneurysms are very rare^{3,5-7}. We report a left main coronary aneurysm initially detected as severe three-vessel

obstruction.

CASE REPORT

A 68-year-old woman with recurrent chest pain was referred to our institution, and admitted under a diagnosis of unstable angina. She had a 2-year history of angina pectoris. Her risk factors for coronary artery disease included hypertension and hyperlipidemia. She had no history of childhood illness compatible with Kawasaki disease or any evidence of vasculitis or past trauma to the chest. On admission, she had a blood pressure of 130/

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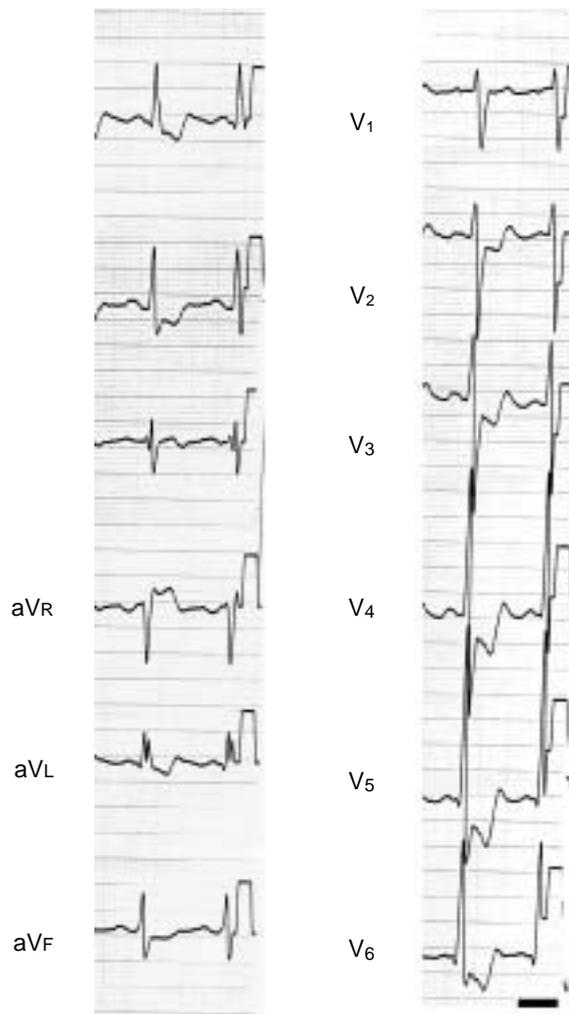


Fig. 1 Electrocardiogram on admission

76 mmHg, and a regular pulse of 80 beats/min. Clinical chemistry examinations found no abnormalities. Electrocardiography showed ST depression in the I , aVL and precordial leads (Fig. 1). Chest radiography showed slight cardiomegaly and cardiothoracic ratio of 59%, but no pulmonary vascular congestion (Fig. 2). Echocardiography revealed diffuse hypokinesis and ejection fraction of 36%. Coronary angiography showed 100% obstruction of the left main trunk and 100% obstruction of the proximal right coronary artery with good collaterals to the left anterior descending artery and left circumflex artery along the conus artery (Fig. 3). None of the other arteries could be identified as collateral source arteries. Based on the results of the coronary angiography, intraaortic balloon pumping was introduced from the left femoral artery.

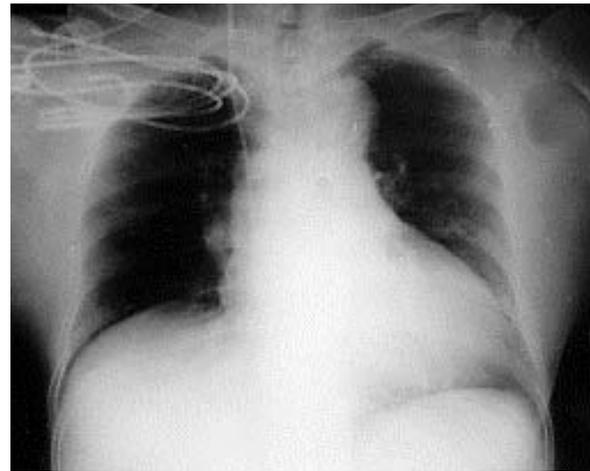


Fig. 2 Chest radiograph after coronary angiography

As the patient had recurrent acute coronary syndrome and high-grade obstructions of the left and right coronary arteries, surgical revascularization was undertaken with two saphenous vein grafts. The grafts were placed in the left anterior descending artery, obtuse marginal branch, and posterolateral and posterior descending coronary arteries. Excellent flow was obtained in both grafts. The postoperative course was uneventful. Electrocardiography showed improvement of ST depression and decline of the R wave voltage compared with the preoperative levels (Fig. 4). Echocardiography revealed improvement of left ventricular wall motion with 60% ejection fraction. Follow-up angiography was obtained 20 days after the surgery. Coronary angiography demonstrated a large saccular aneurysm (10 × 9 mm) originating at the distal segment of the left main coronary artery with 90% stenosis (Fig. 5 - upper), and excellent patency of both saphenous vein grafts (Fig. 6). The patient refused further therapy for the left main coronary aneurysm, so she was treated by medical therapy in lieu of surgical resection or coated stent implantation. Follow-up angiography was performed 1 and 3 years after the surgery. The size of the left main coronary aneurysm remained unchanged at both examinations (Figs. 5 - middle, lower). The patient did well with no further cardiac symptoms after 5 years.

DISCUSSION

This case presents two unusual features. First, left main coronary aneurysm is a very rare disorder³⁻⁷. Second, the conus branch was the only

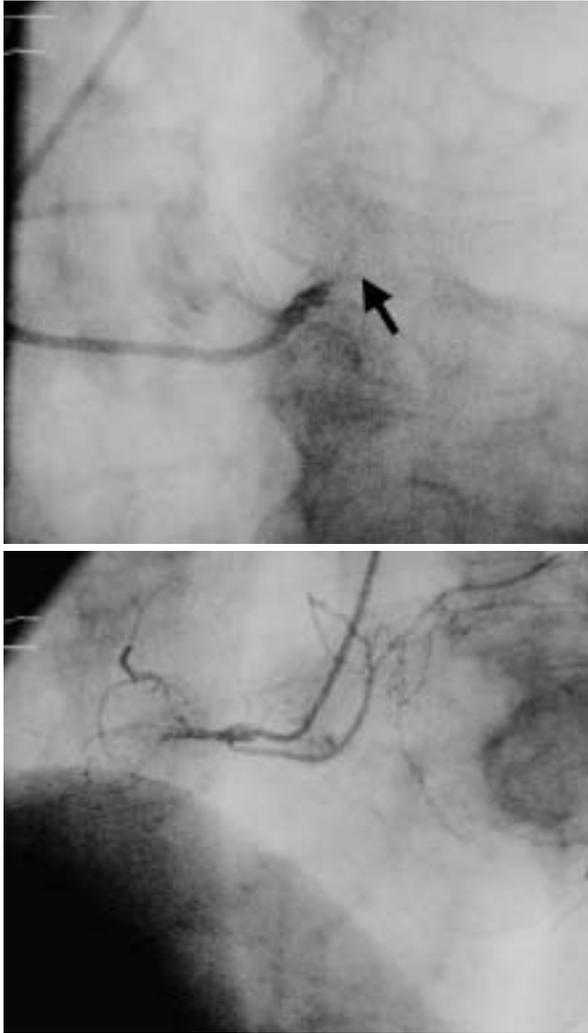


Fig. 3 Coronary angiograms

Upper: Occlusion of the left main trunk (arrow).

Lower: 100% obstruction of the proximal right coronary artery with good collaterals to the left anterior descending artery and left circumflex artery along the conus artery.

coronary artery spared from significant atherosclerotic disease⁸). The latter feature was to be expected given that the critical stenosis affected all three-vessel obstructions, including the left main stem.

The etiological precursors to coronary aneurysms include atherosclerosis, trauma, angioplasty, systemic lupus erythematosus, arteritis, dissection, syphilis, and mycotic emboli⁵). However, this pathology is mainly associated with atherosclerosis^{4,6}). Our patient's history and laboratory findings included no indicators suggestive of active vasculitis or endocarditis as the underlying disease, so the atherosclerotic etiology seems most proba-

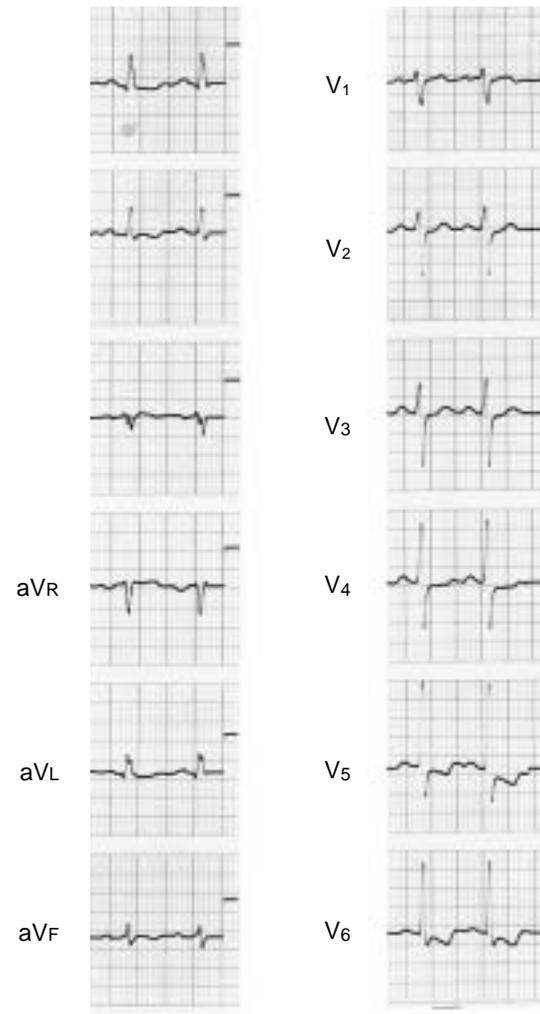


Fig. 4 Electrocardiogram at 20 days after surgery

ble. Moreover, the findings of associated coronary stenoses in our patient strongly implicate an atherosclerotic process.

The main complications of coronary aneurysms are severe coronary stenosis, thrombosis, distal embolization, and rupture. Operative therapy is recommended for large left main coronary aneurysms because of their predisposition to thrombosis and embolism⁹). Coexisting significant obstructive coronary artery disease may be important in making a decision for the operative treatment in patients with left main coronary aneurysm. The choice between medical and surgical treatment for left main coronary aneurysm patients can be difficult to make. The severity of the stenosis may require revascularization by bypass surgery⁵) or coated stent¹⁰). The surgical modalities include isolation, resection, reconstruction, or ligation of the

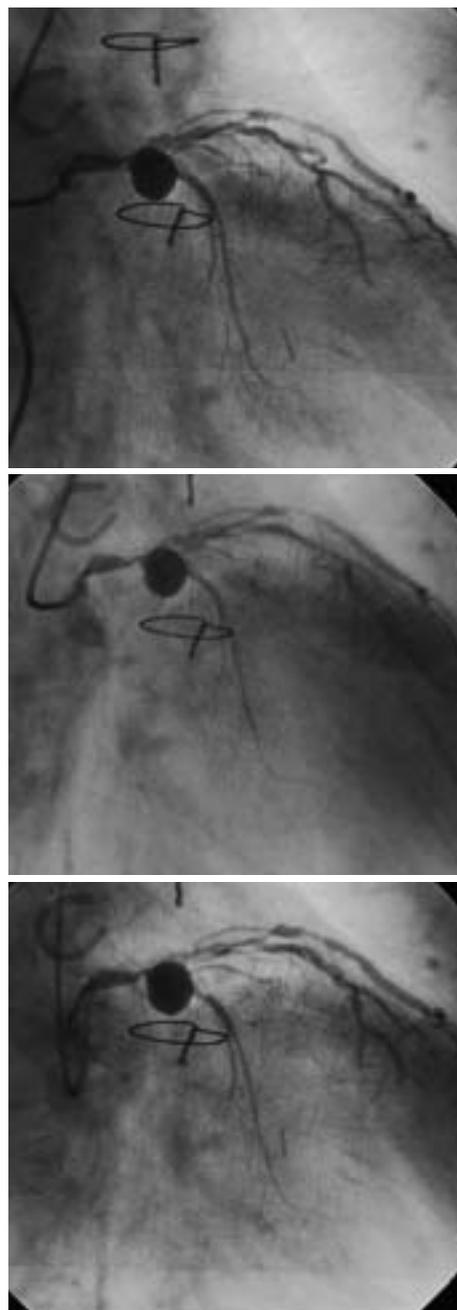


Fig. 5 Left coronary angiograms demonstrating a saccular aneurysm originating at the distal segment of the left main coronary artery with 90% stenosis

Upper: 20 days after surgery.

Middle: 1 year after surgery.

Lower: 3 years after surgery.

left main coronary aneurysm with concomitant myocardial revascularization to eliminate the risk of aneurysm rupture and distal embolization. In our case, the left main coronary aneurysm was only



Fig. 6 Coronary angiograms showing saphenous vein grafts

Upper: Patent saphenous vein graft to the left anterior descending artery.

Lower: Patent saphenous vein graft to the obtuse marginal branch and the posterolateral and posterior descending coronary arteries.

identified after the coronary bypass surgery, so the aneurysm was not resected nor ligated. The left main coronary aneurysm has not yet shown any signs of expansion, but careful follow-up is nonetheless required.

The conus artery was the only active coronary artery because of the critical three-vessel obstruction. Our patient owed her survival to this conus artery, which efficiently collateralised the left coronary artery. Her hemodynamics remained stable, probably due to the good collaterals for her angina

over the previous 2 years. In view of her uneventful postoperative course, we conclude that no thrombus obstructed the left main coronary aneurysm before operation. We believe that the worsening angina was probably caused by a plaque rupture of the left main coronary artery rather than an obstruction by thrombus formation inside the left main coronary

aneurysm.

In general, patients with coronary aneurysm who undergo surgical treatment have a good prognosis⁹⁾. However, our patient refused to undergo surgical resection or ligation of the left main coronary aneurysm. Her clinical course will have to be carefully observed in view of the ongoing risk of aneurysm rupture and distal embolization.

要 約

3枝近位部完全閉塞に左冠動脈主幹部動脈瘤を合併した1例

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木村 征靖 田中 健雄 内海 仁志

症例は68歳の女性で、頻繁に起こる胸痛のため当科に搬送された。冠動脈造影上、左冠動脈主幹部と右冠動脈に完全閉塞が認められ、円錐動脈から左冠動脈に向かう良好な側副血行が認められた。緊急冠動脈バイパス術を行い、2本の大伏在静脈を用い前下行枝と回旋枝および右冠動脈に吻合した。術後の経過は良好で、術後20日目に確認冠動脈造影を行った。冠動脈造影上、左冠動脈主幹部から派生した球状動脈瘤(10×9mm)が認められ、主幹部に90%狭窄を伴っていた。2本の大伏在静脈バイパスグラフトは良好に開存していた。手術から1年目と3年目に冠動脈造影を行ったが、左主幹部冠動脈瘤の大きさは変化は認められなかった。患者は術後5年経過した現在も心症状なく、経過は良好である。

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References

- 1) Swaye PS, Fisher LD, Litwin P, Vignola PA, Judkins MP, Kemp HG, Mudd JG, Gosselin AJ: Aneurysmal coronary artery disease. *Circulation* 1983; **67**: 134 - 138
- 2) Burns CA, Cowley MJ, Wechsler AS, Vetrovec GW: Coronary aneurysms: A case report and review. *Cathet Cardiovasc Diagn* 1992; **27**: 106 - 112
- 3) Topaz O, DiSciascio G, Cowley MJ, Goudreau E, Soffer A, Nath A, Lanter P, Vetrovec GW: Angiographic features of left main coronary artery aneurysms. *Am J Cardiol* 1991; **67**: 1139 - 1142
- 4) Lenihan DJ, Zeman HS, Collins GJ: Left main coronary artery aneurysm in association with severe atherosclerosis: A case report and review of the literature. *Cathet Cardiovasc Diagn* 1991; **23**: 28 - 31
- 5) Smith MD, Cowley MJ, Vetrovec GW: Aneurysms of the left main coronary artery: A report of three cases and review of the literature. *Cathet Cardiovasc Diagn* 1984; **10**: 583 - 591
- 6) Newcomb EW, Youngman DJ, Burton NA, Robinowitz M, Zoltick JM: Atherosclerotic aneurysm of the left main coronary artery. *J Am Coll Cardiol* 1984; **4**: 1062 - 1064
- 7) Ercan E, Tengiz I, Yakut N, Gurbuz A: Large atherosclerotic left main coronary aneurysm: A case report and review of literature. *Int J Cardiol* 2003; **88**: 95 - 98
- 8) Wagdi P, Vuillomenet A, Jenzer HR: Left main coronary aneurysm and severe three-vessel disease with sparing of an isolated conus artery. *Am Heart J* 1996; **131**: 831 - 833
- 9) Turkay C, Golbasi I, Sahin N, Kabukcu M, Bayezid O: Surgical management of an atherosclerotic aneurysm of the left main coronary artery. *J Thorac Cardiovasc Surg* 2001; **122**: 626 - 627
- 10) Strozzi M, Ernst A, Banfic L: Obliteration of a left main coronary artery aneurysm with a PTFE-coated stent. *J Invasive Cardiol* 2002; **14**: 280 - 281