

SPONTANEOUS RECOVERY OF GUIDING CATHETER SEVERE CORONARY DISSECTION DURING CORONARY STENTING PROCEDURE

Dr. Sinan Dağdelen, Dr. Murat Yüce, Dr. Nuri Çağlar

Acibadem Hospital, Cardiology Department, Istanbul

Dört yıl önce koroner stent hikayesi bulunan Hipertansiyon, hiperlipidemi ve stabil anginalı bulunan 59 yaşında erkek hasta, Yapılan koroner anjiyografide, sol ana koroner arter normal, sol ön inen arter proksimalinde plak, orta kısmında %80 darlık saptandı. Sirkumfleks arterdeki stent açık ve sağ koroner arterde kronik total oklüzyon mevcuttu. Sol inen koroner artere perkütan koroner girişim yapılmasına karar verildi. Sol koroner arter ostiumdan yapılan ilk kontrast madde injeksiyonu sırasında sol ana koroner arter normal, sol ön inen koroner arter orta kesiminde daralma ve spazm saptandı. İkinci injeksiyonda sol ana koroner arterde guiding kateter ucuna yakın diseksiyon görüldü

ve hastada ani göğüs ağrısı ve beraberinde elektrokardiyogramda ST değişmesi görüldü. Sol ana koroner arter ortasında büyük bir diseksiyon saptandı. Hemen sol ana koronere stent implante edildi. Kontrol injeksiyonlarda diseksiyonun düzeldiği görüldü. Göğüs ağrısı kayboldu. Elektrokardiyogram normale döndü. Hasta iki gün koroner bakım ünitesinde tutulup, taburcu edildi.

Anahtar kelimeler: Koroner diseksiyon, Sol ana koroner, Stent

(Türk Girişimsel Kard. Der. 2006;10:38-40)

CESE REPORT

A 59 year-old male was admitted for stable angina. He had a known coronary artery disease, moderate controlled hypertension and hyperlipidemia, but no diabetes mellitus. He had no past history of myocardial infarction, but had a history of coronary stent procedure four years ago. His electrocardiography showed asymmetric T wave inversion on precordial and extremity leads and convenient with the left ventricular hypertrophy criterias. Coronary angiography was performed and coronary angiography revealed; normal left main coronary artery, plaque formation in proximal left anterior descending artery, 80% stenosis in mid left anterior descending artery, normal circumflex system with patent previous stent and chronic total occlusions in the right coronary artery. The diseased left coronary artery system supplied good collateral flow to the occluded right coronary artery. Percutaneous coronary intervention was decided for mid left anterior descending artery and he agreed to undergo PCI.

The Judkins-left 4 6Fr catheter was engaged in the left main artery, but manipulation of the catheter was difficult. **Using more back-up force before engaged to**

Figure 1A: First contrast injection shows normal left main



the ostium, the tip of the guide catheter was advanced closer to the left main artery while rotating it clockwise. First contrast injection was showed normal left main (Fig 1A), and little spasm formation in the stenotic segment of mid left anterior descending artery and much less fix stenosis. During the second contrast injection, it revealed a large dissection where the tip of the guide catheter contacted superior margin of the left main artery, and immediately the catheter was draw back. The area in the left main artery dyed by contrast medium widened (Fig 1B), and the patient suddenly

Yazışma adresi: Dr. Sinan DAĞDELEN

Acibadem Hastanesi Tekin Sokak No: 18
Acibadem Kadıköy, İstanbul
Tel:00 90 216 544 41 23
Faks: 00 90 216 325 87 59
E-mail:sinandagdelen@hotmail.com

Figure 1B: The dissection area in the left main artery

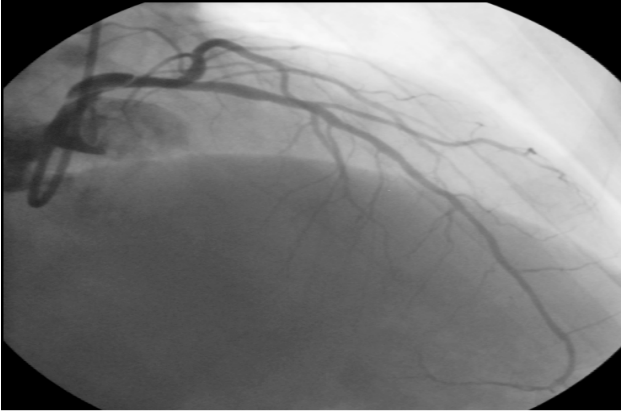
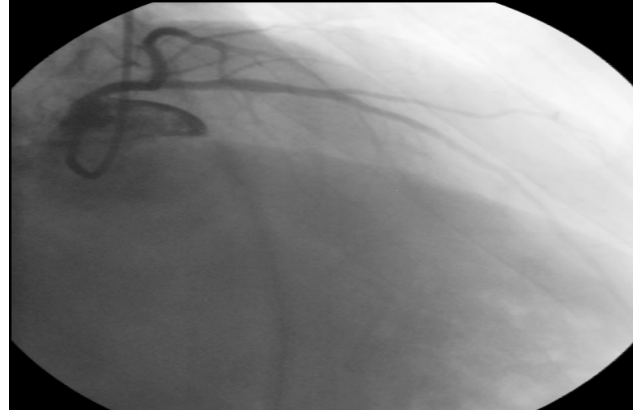


Figure 1C: Finally normal left main coronary artery without dissection



complained of anterior chest pain with ST change on the electrocardiogram. It showed a large dissection in the mid left main artery, which spread anterograde for 10 mm from the entry and retrograde for more than 8 mm. Within two minutes, we decided direct stent implantation for left main artery to close coronary dissection. While we trying to insert guiding catheter, the patient's pain had relieved and ST changes resolved on ECG monitor. The Judkins-left 4 6Fr catheter was engaged slowly in the ostium of the left main artery again. Contrast injection was showed normal left main artery without any dissection (Fig 1C), and it revealed the same normal coronary artery segment with repeated contrast injection after three minutes. The patient was followed for 48 hours in coronary care unit. There was no ECG change, chest pain and troponin rising during the follow-up period, and then the patient was discharged without any other complication.

DISCUSSION

In the present case, it is not certain but probably that the left main coronary dissection was caused by forceful manipulation of the guide catheter. The tip of the guide catheter damaged the wall on the opposite side of the myocardial of the left main coronary artery. It is partly rare complication during the percutaneous coronary intervention, and its incidence was approximately 0.14% which published by Chai et al¹. Some factors, including calcification of the coronary arteries, hypertension, and aging which have been viewed as predisposing factors^{2,3} of aortocoronary dissection during coronary intervention. The incidence of the coronary dissection is more frequent on the right coronary than left system¹. The reason of that right Judkins guiding catheter must be turned

180 degrees from the left side to the right side. This may create a relatively large tensile and vigorous force for the vessel wall.

We think also the following as reasonable explanations as to why the guiding catheter caused this complication. First, tip of the JL4 standart guiding catheter is not much soft and the last angulation of this catheter is not proper for all left main angulation. Second, in our case, the angle between left aortic sinus of Valsalva and left main coronary artery was narrower than usual. This may create a relatively large tensile force, subsequently leading the guiding catheter to rapidly jump into the left main ostium. Therefore, at the moment the guiding catheter to rapidly jump into the left main, a vigorous force would be applied to the vessel wall. as a consequence, this could cause severe dissection of the left main coronary artery. Third, atherosclerotic plaque lesion and calcification could have caused as a supporting factor for this dissection. The proximal RCA thus may lose its elasticity and become brittle. Finally, Extension of the raised coronary flow pressure from the contrast injections^{4,5}. Sometime, coronary dissection may extent to the Valsalva sinus and the ascending aorta^{6,7}.

Left main coronary artery dissection complicating selective coronary angiography is uncommon, and it may require urgent surgical intervention. During percutaneous coronary angioplasty of a catheter induced left main coronary artery dissection, retrograde dissection of the adjacent aortic root may occurred⁸. Catheter-induced coronary artery dissection could be successfully treated by stenting or bypass surgery⁹⁻¹¹. However, before the wide use of stents, it was mostly seen that coronary dissection, which occurred within the PTCA segment, could

have recurred spontaneously in the following period. For example, Schroeder et al¹², reported the impact of untreated coronary dissection on acute and long-term outcome after PTCA alone. They found that the natural history of vessel injury seems to provide favorable wound healing without increase of restenosis. But this is under debate for the current concept about approach for the coronary dissection after PTCA. In our case, first we thought to try direct stent procedure. It was interesting and firstly reported that the spontaneous resolution of acute left main dissection. It was possible mechanism that normal antegrade flow force from aorta decreased retrograde false lumen, and this caused to overlap of the dissected endothelium over the entrance of antegrade false lumen. Then flow force of true lumen closed the false lumen completely. Of course, the entrance direction of false lumen is most important for this mechanism. It could have been better if we imaged it with intravascular ultrasound, but did not try it for high recurrence risk of the dissection.

REFERENCES

1. Chai HT, Yang CH, Wu CF, et al. Utilization of a double-wire technique to treat long extended spiral dissection of the right coronary artery. Evaluation of incidence and mechanisms. *Int Heart J.* 2005;46:35-44.
2. Ochi M, Yamauchi S, Yajima T, Kutsukata N, Bessho Y, Tanaka S. Aortic dissection extending from the left coronary artery during percutaneous coronary angioplasty. *Ann Thorac Surg.* 1996;62:1180-82.
3. Alfonso F, Almeria C, Fernandez-Ortiz A, et al. Aortic dissection occurring during coronary angioplasty: angiographic and transesophageal echocardiographic findings. *Cathet Cardiovasc Diagn.* 1997;42:412-15.
4. Perez-Castellano N, Garcia-Fernandez MA, Garcia EJ, Delcan JL. Dissection of the aortic sinus Valsalva complicating coronary catheterization: Cause, mechanism, evolution, and management. *Cathet Cardiovasc Diagn.* 1998;43:273-79.
5. Moles VP, Chappuis F, Simonet F, et al. Aortic dissection as complication of percutaneous transluminal coronary angioplasty. *Cathet Cardiovasc Diagn.* 1992;26:8-11.
6. Carter AJ, Brinker JA. Dissection of the ascending aorta associated with coronary angiography. *Am J Cardiol.* 1994;73:922-23.
7. Dunning DW, Kahn JK, Hawkins ET, O'Neill WW. Iatrogenic coronary artery dissections extending into and involving the aortic root. *Catheter Cardiovasc Intervent.* 2000;51:387-93.
8. Shukri M, Al-Saif, Ming W, Liu, Nadim Al-Mubarak et al. Percutaneous treatment of catheter-induced dissection of the left main coronary artery and adjacent aortic wall: A case report. *Cathet. Cardiovasc. Intervent.* 2000;49:86-89.
9. Mauser M, Ennker J, Fleischmann D. Dissection of the sinus valsalvae aortae as a complication of coronary angioplasty. *Z Kardiol.* 1999;88:1023-27.
10. Kim JY, Yoon J, Jung HS, Yoo BS, Lee SH. Percutaneous coronary stenting in guide-induced aortocoronary dissection: angiographic and CT findings. *Int J Cardiovasc Imaging.* 2005;21:375-78.
11. Bapat VN, Venn GE. A rare case of aortocoronary dissection following percutaneous transluminal coronary angioplasty: successful treatment using off-pump coronary artery bypass grafting. *Eur J Cardiothorac Surg.* 2003;24:312-14.
12. Schroder S, Baumbach A, Mahrholdt H, et al. The impact of untreated coronary dissections on acute and long-term outcome after intravascular ultrasound guided PTCA. *Eur Heart J.* 2000;21:137-45.