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Case Report

Catheter Induced Coronary Intramural Hematoma: A Case Report

Kateter Kaynaklı Koroner İntramural Hematom: Bir Olgu Sunumu

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Abstract

Catheter-induced coronary artery dissection (CICAD) is a relatively rare complication during coronary procedures. The natural history of CICAD is not entirely understood, but prior reports describe varied outcomes. The CICAD management is currently made case-by-case basis, with no evidence-based guidelines to assist the operator. We present a case of catheter-induced coronary intramural hematoma (IMH), which is conservatively managed. On the follow-up two weeks later, we performed IVUS – guided percutaneous coronary intervention (PCI) with good results. We highlighted the approach in managing iatrogenic coronary IMH.

Keywords: Catheter induced coronary artery dissection (CICAD), conservative management, intravascular ultrasound

Öz

Kateter kaynaklı gelişen aortokoroner diseksiyon koroner prosedürler sırasında nispeten nadir bir komplikasyondur. Kateter kaynaklı gelişen aortokoroner diseksiyon 'in doğal geçmişi tam olarak anlaşılamamıştır, ancak önceki raporlar çeşitli sonuçları açıklamaktadır. Kateter kaynaklı gelişen aortokoroner diseksiyon yönetimi şu anda, operatöre yardımcı olacak kanıta dayalı kılavuzlar olmaksızın duruma göre yapılmaktadır. Konservatif olarak yönetilen bir catheter-induced coronary intramural hematoma, olgusunu sunuyoruz. İki hafta sonraki kontrolde IVUS rehberliğinde peruktan korener girşim uyguladık ve iyi sonuçlar aldık. İyatrojenik koroner intramural hematoma yönetiminde yaklaşımı vurguladık.

Anahtar kelimeler: Kateter kaynaklı gelişen aortokoroner diseksiyon, konservativ tedavi, intravasküler ultrason

INTRODUCTION

Iatrogenic coronary intramural hematoma (IMH) is a complication that could occur during the PCI procedure. The incidence and natural history of iatrogenic IMH are not entirely comprehended; however, several studies have described it. To date, there is no uniformity in IMH management; hence, the case-based approach is the treatment strategy in such cases. We present a case of catheter-induced IMH with initial conservative, and on the follow-up two weeks later, we performed IVUS – guided PCI with good results. We highlighted the approach in managing iatrogenic coronary IMH.

Case presentation

A 48 years old male came with typical angina despite optimal medical therapy. His risk factors were Type 2 diabetes mellitus, smoker, and dyslipidemia. His vital signs and physical examinations were within normal limits. An echocardiogram revealed an ejection fraction of 60% with hypokinetic in inferior and inferoseptal segments. Cardiac catheterization was planned for the patient. Angiogram revealed LM bifurcation stenosis and chronic total occlusion (CTO) at distal RCA with collateral from LAD and LCx (Fig 1). With these findings, the patient was offered CABG, but he refused; hence we planned to perform PCI CTO RCA and followed with PCI LM bifurcation.

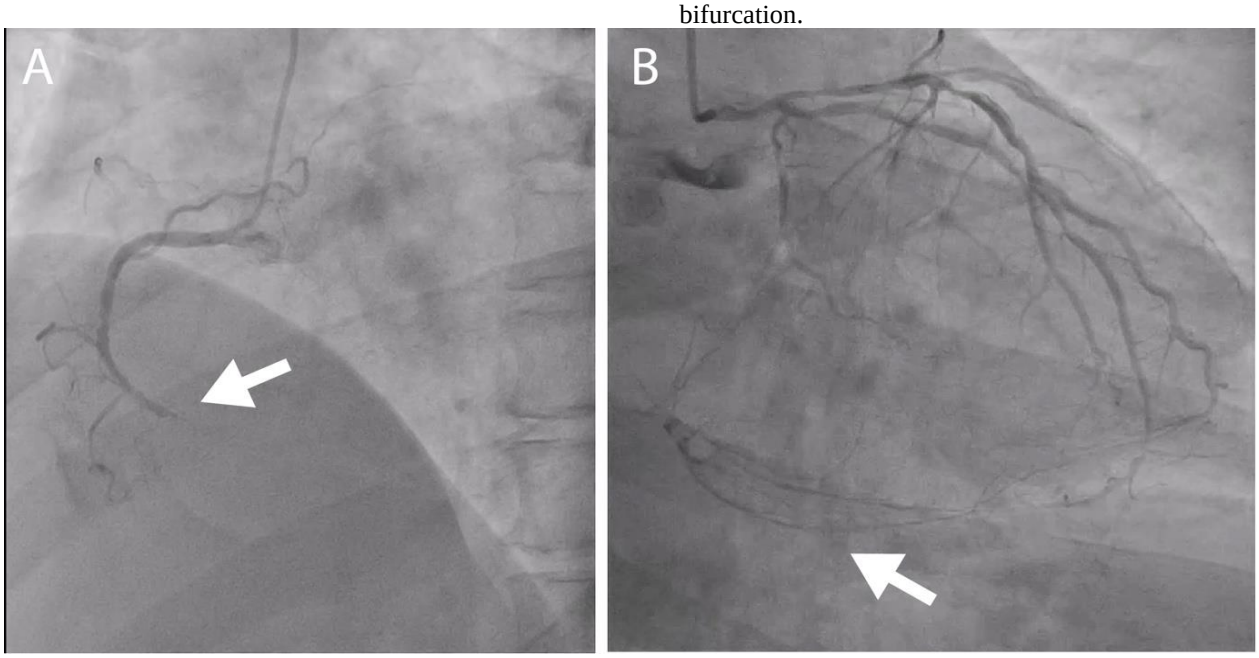

Figure 1. Angiogram revealed (A) CTO at distal RCA and (B)collateral channel from LCA.

We proceeded with PCI to the CTO lesion at RCA. RCA cannulation was performed with GC Amplatz Left (AL) 0.75 7 Fr. PCI was performed with an antegrade approach. Supported with 6Fr GEC Guidezilla (Boston Scientific, USA), GW Run-through Intermediate (Terumo Japan) with backup 2.6Fr Elong Microcatheter (APT Medical, China) was successfully crossed the CTO lesion. IVUS study was performed after dilation with a 2.5/20mm Ikazuchi SCB (Kaneka, Japan), which revealed diffuse fibrotic plaque. Lesion preparation was performed with further predilation with a prior SCB balloon.

A 3.5/38 mm Xience Prime LL (Abbott, USA) was deployed at distal RCA. Nonetheless, the GC was unexpectedly disengaged while the wire was still intact in the lumen (Fig 2A). An attempt at recannulation was achieved, but the wire was unintentionally removed. Small and careful contrast injection revealed dissection at the proximal part of RCA.

The patient was asymptomatic, hemodynamically stable, without any ECG changes; therefore, we opted to stop the procedure. The patient was then transferred to the cardiac intensive care unit for observation and discharged the following days.

Follow up was performed two weeks later. RCA cannulation was performed with GC JR 3.5 6Fr, and an angiogram revealed dissection at proximal to mid-RCA with haziness (Fig 2B). IVUS study showed large intramural hematoma (Fig 3A). Our strategy to deal with the IMH was to use high-pressure inflation of a 3.5/10 mm Wolverine cutting balloon (Boston Scientific, USA). IVUS evaluation revealed a reduction of the intramural hematoma (Fig 3B). We deployed a 3.5/38 mm Ultimaster (Terumo, Japan) at proximal RCA and stent optimization with a 3.5/15

atm Emerge NC balloon (Boston Scientific, USA). Final IVUS evaluation showed no distal stent edge dissection, well expanded and well-apposed stent, and MSA of 8.5 mm2 (Fig 3C). The final angiogram revealed TIMI 3 flow (Fig 2C).

The patient was sent to the cath lab for staged LM bifurcation PCI three months later. RCA angiogram revealed a patent stent at proximal and distal RCA. IVUS – guided PCI to LM bifurcation was performed, with good results.

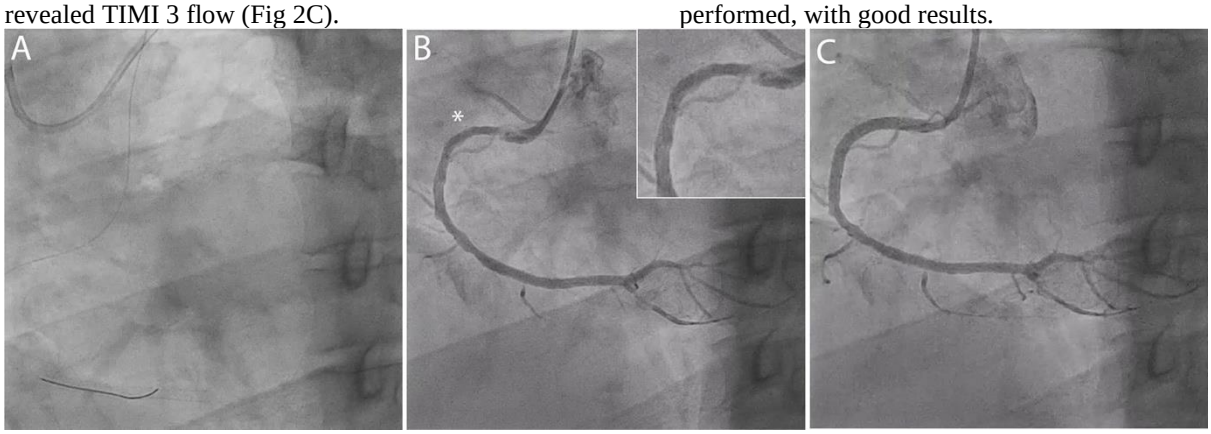

Figure 2. (A) Guiding catheter was unexpectedly disengaged while the wire was still in the lumen, (B) A follow-up two weeks later revealed haziness at proximal RCA, and (C) Final angiogram after stenting.

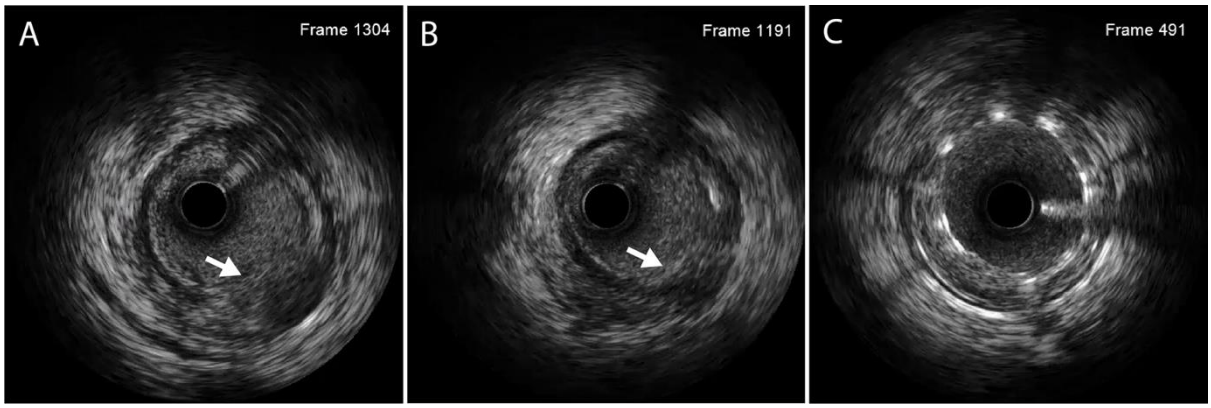

Figure 3. IVUS study showed (A) Large intramural hematoma, (B) after cutting balloon dilation, the hematoma volume was reduced, and (C) Final IVUS evaluation showed well expanded and well-apposed stent, with MSA of 8.5 mm2.

Discussion

Complications of PCI may significantly impact patient outcomes; hence, prompt recognition is essential to prevent unfavorable outcomes. CICAD is a relatively rare complication during the coronary procedure. Prior studies described CICAD as associated with guiding catheter Amplatz Left and guide catheter extension, as in our case (1,2).

Intramural hematoma (IMH) is a blood accumulation within the medial space displacing the internal elastic membrane inward and the external elastic membrane outward, with or without identifiable entry and exit points (3). Maehara et al. reported IMH most likely involved proximal segments and involving the RCA, as in our case (4). There are no universal guidelines regarding the management of IMH. Yamamoto et al. have described a conservative approach in a case of large intramural hematoma (5). In this case, we opted for conservative management initially because the patient was stable and to prevent the risk of rewiring to subintimal and worsen the dissection.

A follow-up angiogram and IVUS guided PCI was performed two weeks later. Prior studies recommended using intravascular imaging in assessing intramural hematoma (3,6,7). In this case, the IVUS study has identified the true and false lumen, detecting the large intramural hematoma, the length of the dissection, and the reference diameters. Furthermore, Ito et al. have described the feasibility of cutting balloons in treating IMH by fenestrating the large intramural hematoma and thus reducing its volume (8). As in our case, the high-pressure cutting balloon was inflated at the affected segments, and IVUS evaluation revealed reduced IMH volume, followed by stenting with good results.

Conclusion

Conservative management of catheter-induced coronary artery dissection should be considered in non-flow limiting dissection and stable patients. Intravascular ultrasound is a safe and effective intracoronary imaging device detecting PCI complications, particularly intramural hematoma. A high-pressure cutting balloon should be considered in managing coronary intramural hematoma.

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Concept: AFY
Literature Review: SS,AS
Design: ANN
Data acquisition: AFY,SS,AS
Analysis and interpretation: AFY,SS,AS
Writing manuscript: SS,AS
Critical revision of manuscript: AFY
Conflict of Interest: The authors have no conflicts of interest to declare.
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