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Acute Stent Thrombosis: A Case at the Montlucon Hospital Center

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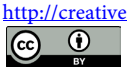

Abstract

Background and objective: Coronary angioplasty is one of the techniques introduced in 1976 by Andreas Grüntzig in Zurich. It is a revolutionary procedure that allows coronary circulation to be restored by inserting a stent. This new technique has considerably evolved over time, but sometimes has limitations, such as the development of neo-pathologies like stent thrombosis. The aim of our case report is to highlight one of the limitations of coronary angioplasty, although rare, and to encourage greater clinical and electrical monitoring after each procedure. **Case report**: We report the case of a patient who presented with early stent thrombosis barely an hour after placement of a pharmacoactive stent. Chest pain reported by the patient after the procedure and electrical changes prompted an urgent repeat procedure. Aetiologies of stent thrombosis are multifactorial, including patient-, procedure- and stent-dependent factors. **Conclusion**: Although rare, there is a risk of stent thrombosis after coronary angioplasty. Careful monitoring and rigorous follow-up of patients after coronary angioplasty are therefore required, as the prognosis for stent thrombosis is fairly poor.

Keywords

Coronary Angioplasty, Acute Stent Thrombosis, Multifactorial, Poor Prognosis

1. Introduction

Coronary angioplasty is one of the techniques introduced in 1976 by Andreas

Grüntzig in Zurich, a revolutionary technique that allows the restoration of coronary circulation through the placement of a stent [1]. As with all therapeutic advances, this technique has its limits, generating new pathologies such as intrastent restenosis and stent thrombosis; serious complications of coronary angioplasty, although significantly rarer with pharmaco-active stents and the new anti-platelet agent protocols. According to the Academic Research Consortium (ARC), stent thrombosis is defined as acute between 0 and 24 hours, sub-acute between 24 hours and 30 days, late between 30 days and one year, and very late beyond one year after stent implantation [2]. Acute and subacute thrombosis are grouped together under the term early stent thrombosis.

1. Case Report

We report the case of a 71-year-old patient referred by her attending physician for a coronary angiography. She presented with progressively worsening exertional angina with dyspnea on exertion. Its cardiovascular risk factors combine high blood pressure (hypertension), type II diabetes, dyslipidemia, excess weight and renal failure. The electrocardiogram (ECG) performed on the patient's admission was normal (**Figure 1**), and the left ventricular ejection fraction (LVEF) on transthoracic ultrasound (TTE) performed four days before admission was 61%. At precisely 9:38 a.m., the procedure begins for a duration of 22 minutes with a total of 48 ml of XENETIX brand iodinated contrast product used. Coronary angiography performed using the 6F right radial approach revealed subocclusion of the dominant right coronary artery (**Figure 2**) and significant stenosis of the bisector measuring 70% (**Figure 3**). Using a BMW 0.014 guide and a SAPPHIRE II PRO 2.5 × 15 mm balloon, predilatation will be carried out at 15 atmospheres for 15 seconds with good relief of the lesion. This was followed by stenting using an everolimus-coated stent (SYNERGY 4 mm × 20 mm) gradually deployed at 12 atmospheres then 15 atmospheres for 30 seconds. The result was excellent (**Figure 4**). Given renal insufficiency, angioplasty of the bisector was scheduled at a later stage.

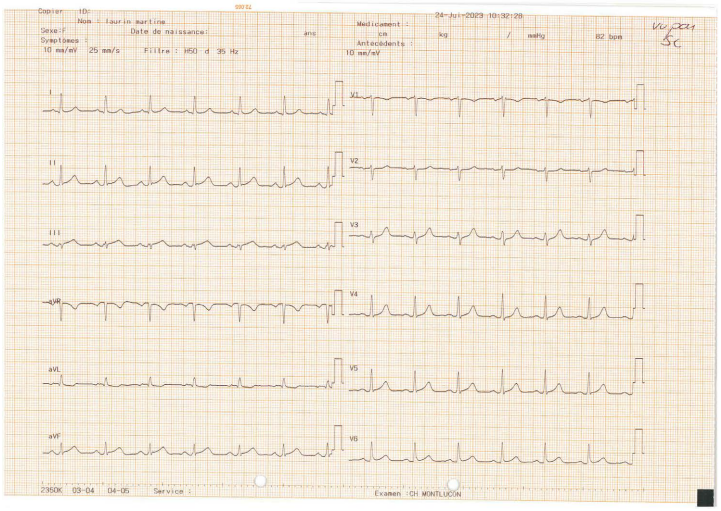

Figure 1. ECG at admission (before coronary angiography).

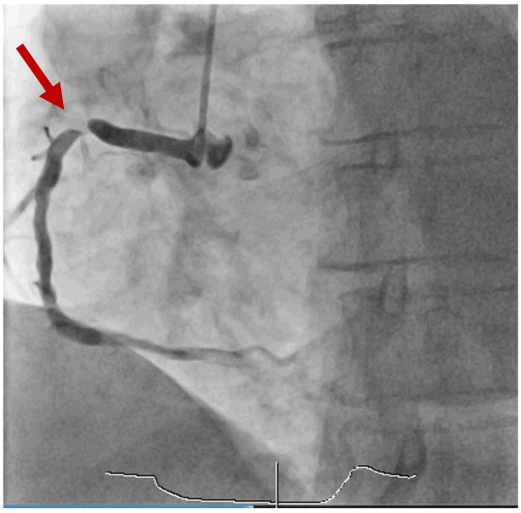

Figure 2. Subocclusion of the right coronary artery at its proximal bend.

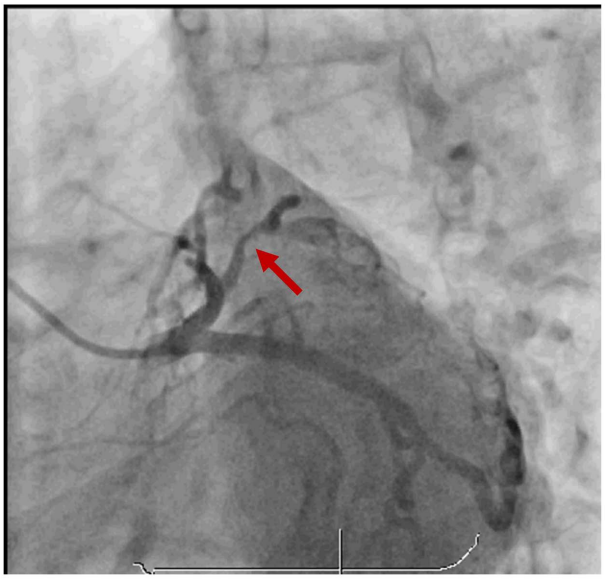

Figure 3. Significant stenosis of the diagonal artery.

Fifty minutes after the procedure, the patient presented, despite the addition of 600 mg of CLOPIDOGREL combined with 5000 IU of unfractionated HEPARIN, 250 mg of ASPIRIN and a loading dose of TIROFIBAN intracoronally, chest pain. Anginal in appearance with an increased shift of the ST segment inferiorly (**Figure 5**). This indicates stent thrombosis confirmed on coronary angiography immediately performed via the 6F right femoral route (**Figure 6**). The latter will be treated by productive thromboaspiration and by balloon angioplasty alone with excellent results (**Figure 7**). Clinically, there was an improvement in the pain and electrically, we demonstrated a disappearance of the ST segment elevation inferiorly (**Figure 8**). CLOPIDOGREL was stopped in favor of TICAGRELOR with an excellent response.

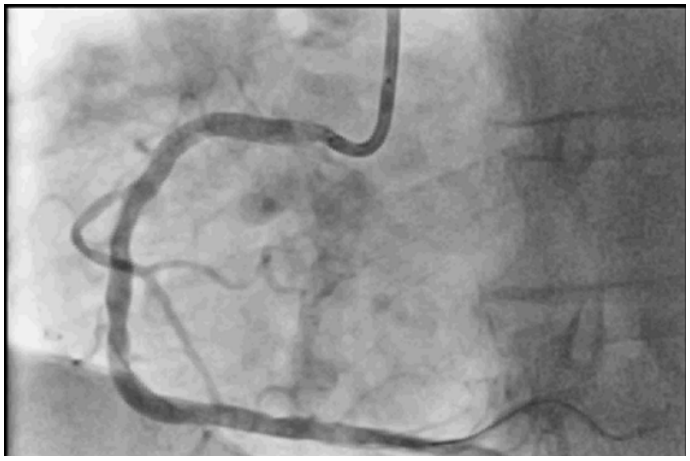

Figure 4. Results of Right coronary angioplasty.

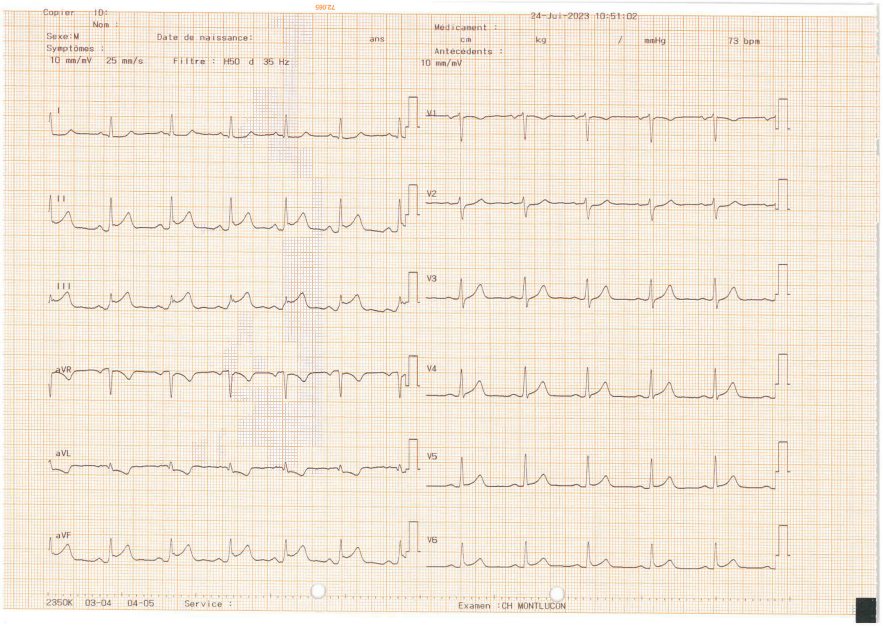

Figure 5. Inferior ST-segment elevation.

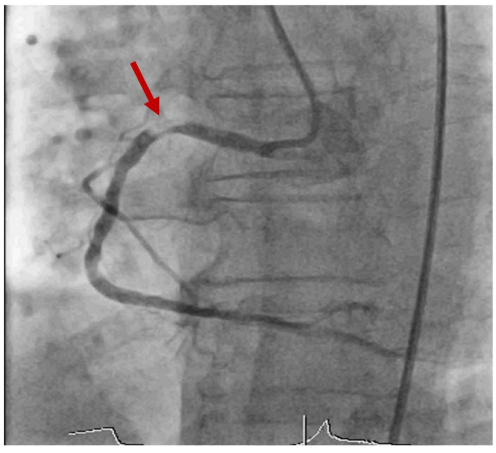

Figure 6. Stent Thrombosis.

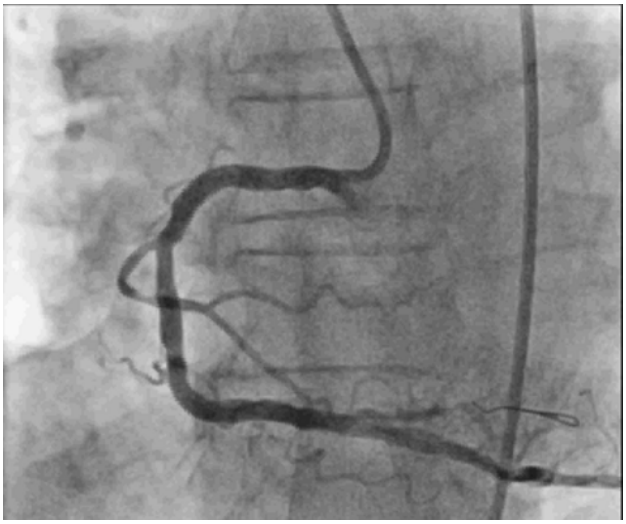

Figure 7. Post Thrombo-aspiration angioplasty results.

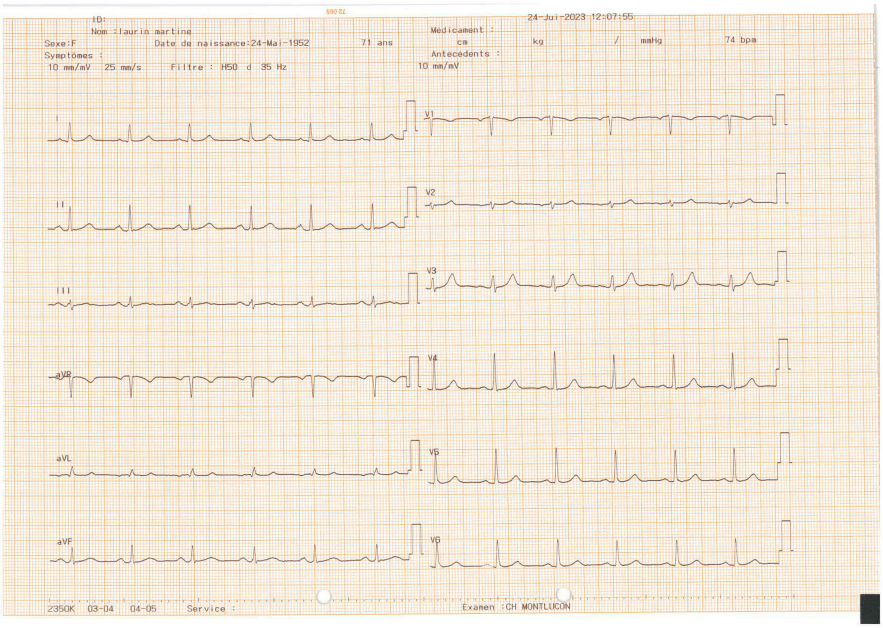

Figure 8. ST-segment regression after thrombo-aspiration and active stenting.

2. Discussion

The occurrence of stent thrombosis after angioplasty is a classic event, due to the absence of endothelium on the surface of the stent [2]-[5]. A rare and serious complication, its incidence is currently around 1% with the advent of dual antiplatelet aggregation [4] [6] [7]. However, it is a severe and serious complication which leads to in-hospital death in 30% of cases, or to a large myocardial infarction with ST segment elevation [8] [9]. The predictive factors for this complication are numerous and are usually divided into three groups, depending on the patient, the stent and the procedure [7]-[10].

Among the patient-dependent factors, we mainly note diabetes, acute coronary

syndrome, inflammatory syndrome, discontinuation of antiplatelet agents and variability of the biological response to clopidogrel [7] [10]. In our case, the lack of response to CLOPIDOGREL was initially incriminated with replacement of the latter by TICAGRELOR. A VASP (Vasodilator Stimulated Phospoprotein-Flow Cytometry) test carried out revealed a platelet reactivity index of 20% giving the patient a good responder profile to thienopyridines. The C-reactive Protein being 1.6 mg/l, the only patient-dependent factor found was diabetes which was poorly controlled with glycosylated hemoglobin at 7.7%. On an evolutionary level, we note the absence of clinical and electrical events with TICAGRELOR prescribed instead of CLOPIDOGREL.

Stent-related factors include stent number, lesion length, diameter, stent drug, poor stent expansion, and stent fracture [7] [10]. The stent used in our case was coated with everolimus, a new generation pharmacoactive substance. The stent chosen at the right size had been deployed at high atmospheres (15 atmospheres) for a reasonable duration (30 seconds), making it possible to rule out the hypothesis of poor expansion of the stent. Endocoronal imaging was not performed because stent deployment was considered optimal.

Procedural factors included stent malapposition, direct stenting, complex lesions, residual dissection and residual thrombus. In our case, high atmosphere predilatation (15 atmospheres) was performed on this non-complex lesion. There was no residual thrombosis after stenting and the final result was excellent.

In the event of stent thrombosis, treatment consists of immediate reperfusion of the occluded artery by primary angioplasty, with the main aim of achieving rapid and adequate reperfusion with good flow (TIMI 3) as quickly as possible [8]. The occurrence of stent thrombosis in less than an hour after angioplasty, without any obvious cause, raises important questions about the existence of other, as yet unknown, factors. Patients must be rigorously monitored after each angioplasty. It must be clinical, taking into account all the patient's symptoms, and electrical, with the systematic performance of an electrocardiogram at the slightest symptom.

In the literature, early stent thrombosis is rare, and is linked to the ineffectiveness of clopidogrel (compliance and metabolism problems), whereas late thrombosis seems to be linked more to the characteristics of the stent itself and the vascular wall [11].

3. Conclusion

Stent thrombosis remains the Achilles heel of angioplasty. Despite a marked reduction in its incidence thanks to new antiplatelet protocols, this complication remains extremely serious, leading to death and myocardial infarction. Interventional cardiologists must therefore bear in mind the many different factors that predict this complication in order to guide their technique, the choice of stent and the duration of antiplatelet treatment, which remains the cornerstone of prevention. Biological monitoring of the efficacy of these treatments will also need to be

introduced on a routine basis.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Wennberg, D.E., Lucas, F.L., Siewers, A.E., Kellett, M.A. and Malenka, D.J. (2004) Résultats de l'angioplastie coronaire en fonction de la présence ou non sur site d'une chirurgie de pontage coronarien. *JAMA*, **292**, 1961-1968

[2] Cutlip, D.E., Windecker, S., Mehran, R., Boam, A., Cohen, D.J., van Es, G., *et al*. (2007) Clinical End Points in Coronary Stent Trials. *Circulation*, **115**, 2344-2351. https://doi.org/10.1161/circulationaha.106.685313

[3] Mboup, M.C., Moquet, B., Zabalawi, A. and Delaunay, R. (2013) Thrombose très tardive d'un stent nu dix ans après son implantation : A propos d'une observation. *Annales de Cardiologie et d'Angéiologie*, **62**, 435-437. https://doi.org/10.1016/j.ancard.2012.04.005

[4] Schömig, A., Neumann, F., Kastrati, A., Schühlen, H., Blasini, R., Hadamitzky, M., *et al*. (1996) A Randomized Comparison of Antiplatelet and Anticoagulant Therapy after the Placement of Coronary-Artery Stents. *New England Journal of Medicine*, **334**, 1084-1089. https://doi.org/10.1056/nejm199604253341702

[5] Virmani, R., Farb, A., Guagliumi, G. and Kolodgie, F.D. (2004) Drug-eluting Stents: Caution and Concerns for Long-Term Outcome. *Coronary Artery Disease*, **15**, 313-318. https://doi.org/10.1097/00019501-200409000-00003

[6] Taniuchi, M., Kurz, H.I. and Lasala, J.M. (2001) Randomized Comparison of Ticlopidine and Clopidogrel after Intracoronary Stent Implantation in a Broad Patient Population. *Circulation*, **104**, 539-543. https://doi.org/10.1161/hc3001.093435

[7] (2023) RMC_26_compressed.pdf. https://smcmaroc.org/wp-content/uploads/2019/06/RMC_26_compressed.pdf#page=14

[8] El-Mourad, M. (2014) Myocardial Ischemia in General Medicine and the Coronary Stent Revolution. *Revue Medicale de Bruxelles*, **35**, 306-311.

[9] Lemesle, G., Delhaye, C., Bonello, L., de Labriolle, A., Waksman, R. and Pichard, A. (2008) Stent Thrombosis in 2008: Definition, Predictors, Prognosis and Treatment. *Archives of Cardiovascular Diseases*, **101**, 769-777. https://doi.org/10.1016/j.acvd.2008.10.006

[10] (2023) Thromboses de stents: facteurs favorisants. https://www.realites-cardiologiques.com/wp-content/uploads/sites/2/2010/11/018.pdf

[11] (2013) Thrombose de stent en 2013. https://www.cardiologie-pratique.com/journal/article/0010276-thrombose-de-stent-en-2013