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Clinical Data Analysis: Noncompliant, High-Pressure Balloon and Calcified, Undilatable Coronary Lesions

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Abstract

Optimal stent deployment can become a challenge for the interventional cardiologist, especially when it involves calcified, undilatable lesions. Various technologies have been developed to tackle this scenario and the super high-pressure balloon seems to be a promising adjunct in treating undilatable lesions. Herein, we present our initial experience with a new noncompliant, super high pressure balloon.

The **Apollo Balloon Dilatation Catheter**, developed by **Brosmed Medical Co., Ltd**, has undergone a comprehensive clinical review in alignment with the European Medical Device Regulation (MDR) and the MDCG guidance for clinical evaluation. This review forms part of the ongoing clinical data collection requirements under MDR, ensuring that the device meets stringent standards of clinical performance, safety, and benefit for patients. The clinical overview focused on demonstrating the Apollo Balloon's effectiveness in supporting optimal stent deployment, especially in cases involving challenging calcified or undilatable lesions. For interventional cardiologists, these lesions present a unique challenge, and the Apollo Balloon's noncompliant, super high-pressure design has shown promise as an adjunct technology in treating such complex cases.

Through extensive clinical data collection and evaluation, compliance with the General Safety and Performance Requirements (GSPR) was verified, confirming the Apollo Balloon Dilatation Catheter's adherence to regulatory standards. The catheter's high-pressure capacity facilitates precise stent deployment and improves treatment outcomes, offering a valuable tool in interventional cardiology for managing difficult lesions. This clinical review underscores the catheter's clinical benefits and reinforces its role in supporting advanced treatment options for patients.

Keywords: calcified, undilatable lesions, GSPR, Apollo Balloon Dilatation Catheter

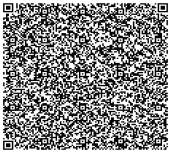
References

1. Nakamura S, Colombo A, Gaglione A, et al. Intracoronary ultrasound observations during stent implantation. *Circulation*. 1994 May; 89(5): 2026-2034.
2. Colombo A, Hall P, Nakamura S, et al. Intracoronary stenting without anticoagulation accomplished with intravascular ultrasound guidance. *Circulation*. 1995 Mar 15; 91(6): 1676-1688.
3. Tang Z, Bai J, Su S-P, et al. Cutting-balloon angioplasty before drug-eluting stent implantation for the treatment of severely calcified coronary lesions. *J Geriatr Cardiol JGC*. 2014 Mar; 11(1): 44-49.
4. Reifart N, Vandormael M, Krajcar M, et al. Randomized comparison of angioplasty of complex coronary lesions at a single center. Excimer Laser, Rotational Atherectomy, and Balloon Angioplasty Comparison (ERBAC) Study. *Circulation*. 1997 Jul 1; 96(1): 91-98.
5. Fernandez JP, Hobson AR, McKenzie D, et al. Beyond the balloon: excimer coronary laser atherectomy used alone or in combination with rotational atherectomy in the treatment of chronic total occlusions, non-crossable and non-expandable coronary lesions. *EuroIntervention*. 2013 Jun; 9(2): 243-250. doi: 10.4244/EIJV9I2A40.
6. Brown DL, George CJ, Steenkiste AR, et al. High-speed rotational atherectomy of human coronary stenoses: acute and one-year outcomes from the New Approaches to Coronary Intervention (NACI) Registry. *Am J Cardiol*. 1997 Nov; 80(10): 60K- 67K. doi: [https://doi.org/10.1016/S0002-9149\(97\)00765-0](https://doi.org/10.1016/S0002-9149(97)00765-0).
7. Couper LT, Loane P, Andrianopoulos N, et al. Utility of rotational atherectomy and outcomes over an eight-year period: RA Treats complex lesions with low procedural complications and MACE rates. *Catheter Cardiovasc Interv*. 2015 Oct; 86(4): 626- 631. doi: 10.1002/ccd.26077.
8. Dill T. A randomized comparison of balloon angioplasty versus rotational atherectomy in complex coronary lesions (COBRA study). *Eur Heart J*. 2000 Nov 1; 21(21): 1759-1766. Available online at <https://academic.oup.com/eurheartj/articlelookup/doi/10.1053/euhj.2000.2242>. Accessed June 20, 2019.
9. Camnitz WM, Keeley EC. Heavily calcified coronary arteries: the bane of an interventionalist's existence. *J Interv Cardiol*. 2010 Jun; 23(3): 254-255. doi: 10.1111/j.1540-8183.2010.00553.x.
10. Barbato E, Carrié D, Dardas P, et al. European expert consensus on rotational atherectomy. *EuroIntervention*. 2015 May; 11(1): 30-36. doi: 10.4244/EIJV11I1A6.
11. Mauri L, Reisman M, Buchbinder M, et al. Comparison of rotational atherectomy with conventional balloon angioplasty in the prevention of restenosis of small coronary arteries: results of the Dilatation vs Ablation Revascularization Trial Targeting Restenosis (DART). *Am Heart J*. 2003 May; 145(5): 847-854. [https://doi.org/10.1016/S0002-8703\(03\)00080-2](https://doi.org/10.1016/S0002-8703(03)00080-2).
12. Abdel-Wahab M, Richardt G, Joachim Büttner H, et al. High-speed rotational atherectomy before paclitaxel-eluting stent implantation in complex calcified coronary lesions: the randomized ROTAXUS (Rotational Atherectomy Prior to Taxus Stent Treatment for Complex Native Coronary Artery Disease) trial. *JACC Cardiovasc Interv*. 2013 Jan; 6(1): 10-19. doi: 10.1016/j.jcin.2012.07.017.
13. Raja Y, Routledge HC, Doshi SN. A noncompliant, high pressure balloon to manage undilatable coronary lesions. *Catheter Cardiovasc Interv*. 2010 Jun 1; 75(7): 1067-1073. doi: 10.1002/ccd.22430.
14. Díaz JF, Gómez-Menchero A, Cardenal R, et al. Extremely high-pressure dilation with a new noncompliant balloon. *Tex Heart Inst J*. 2012; 39(5): 635-638.
15. Secco GG, Ghione M, Mattesini A, et al. Very high-pressure dilatation for undilatable coronary lesions: indications and results with a new dedicated balloon. *EuroIntervention*. 2016 Jun; 12(3): 359-365. doi: 10.4244/EIJY15M06_04.
16. Fabris E, Caiazzo G, Kilic ID, et al. Is high pressure postdilation safe in bioresorbable vascular scaffolds? Optical coherence tomography observations after noncompliant

balloons inflated at more than 24 atmospheres.

Catheter Cardiovasc Interv. 2016 Apr; 87(5): 839- 846. doi: 10.1002/ccd.26222.

17. Tanaka A, Jabbour RJ, Kawamoto H, et al. A super high-pressure balloon solution for a non-dilatable in-stent restenosis. *Int J Cardiol.* 2016 Jan; 203: 357-359. doi: 10.1016/j.ijcard.2015.10.188.

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