American Journal of Medical Case Reports, 2021, Vol. 9, No. 10, 495-498
Available online at http://pubs.sciepub.com/ajmcr/9/10/4
Published by Science and Education Publishing
DOI:10.12691/ajmcr-9-10-4

A Case of Rumpel-Leede Phenomenon in Ulnar Artery Catheterization

Pramod Theetha Kariyanna[1], Amog Jayarangaiah[2], David D. Song[1], Apoorva Jayarangaiah[3], Sushruth Das[2], Ashkan Tadayoni[4], Samy I. McFarlane[4,*]

[1]ivision of Interventional Cardiology, Mount Sinai Heart, Icahn School of Medicine at Mount Sinai Morningside/Beth Israel Hospitals, New York City, NY-10025, U.S.A.
[2]Trinity School of Medicine, 925 Woodstock Road, Roswell, GA 30075, U.S.A.
[3]Division of Hematology-Oncology, Department of Internal Medicine, Albert Einstein College of medicine/ Jacobi Medical Center, Bronx, N.Y.-10461, U.S.A.
[4]Department of Internal Medicine, State University of New York: Downstate Medical Center, Brooklyn, New York, United States-11203
*Corresponding author: Smcfarlane@downstte.edu

Received April 23, 2021; Revised May 27, 2021; Accepted June 08, 2021

Abstract Rumpel - Leede phenomenon (RLP) was described as early 1909 by Theodore Rumpel and by Stockbridge Leede in 1911 in patients suffering from scarlet fever. Acute development of petechial rashes distal to the application of blood flow occlusive devices such as a blood pressure cuff or tight wrapped bandage, is a typical finding in this phenomenon. Multiple isolated cases of RLP associated with coronary angiogram have been reported. In this report, we present a case of a 53-year-old male who developed RLP after percutaneous intervention of the proximal-mid left anterior descending artery after application of a sphygmomanometer cuff to contain a right forearm hematoma and application of a trans-radial band. We here discuss the etiopathogenesis and management of RLP that develops post coronary angiogram.

Keywords: *Rumpel - Leede phenomenon, coronary angiogram, Ulnar Artery Catheterization, petechial rash, TR band, forearm hematoma*

Cite This Article: Pramod Theetha Kariyanna, Amog Jayarangaiah, David D. Song, Apoorva Jayarangaiah, Sushruth Das, Ashkan Tadayoni, and Samy I. McFarlane, "A Case of Rumpel-Leede Phenomenon in Ulnar Artery Catheterization." *American Journal of Medical Case Reports*, vol. 9, no. 10 (2021): 495-498. doi: 10.12691/ajmcr-9-10-4.

1. Introduction

Rumpel-Leede phenomenon (RLP) was described as early 1909 by Theodore Rumpel and Stockbridge Leede in 1911 in patients suffering from scarlet fever [1]. Acute development of petechial rashes distal to blood flow occlusive devices such as a blood pressure cuff or a tight wrap bandage is a typical finding in this phenomenon. RLP is mostly benign and resolves with conservative management. Multiple isolated cases of RLP associated with coronary angiogram have been reported in recent years. Here we present a case of RLP in a patient after an elective coronary angiogram performed via tight ulnar artery access. The procedure was complicated by a small forearm hematoma which was conservatively managed by application of a sphygmomanometer cuff to contain and stop the bleeding, following which RLS was noted. We here present the case and discuss the pathogenesis and management.

2. Clinical Presentation

A 53-year-old male with a history of diabetes mellitus, hypertension, hyperlipidemia and smoking was referred for a diagnostic coronary angiogram by his primary doctor. The patient had presented to his primary care doctor with typical angina on exertion, hence a nuclear stress test which was performed showed moderate anteroseptal ischemia. On the day of presentation, he was afebrile, heart rate was 77 beats/minute, blood pressure was 127/82 and respiratory rate was 16 cycles/min. The patient had no significant findings on physical examination, however, a weak right radial pulse of 1+ was noted. The patient's complete blood count, complete metabolic profile and coagulation profile revealed no abnormal findings, and the pertinent values have been tabulated (Table 1). Hence a decision was made to perform a coronary angiogram using right ulnar artery access using ultrasound guidance. Prior to the angiogram, the patient was loaded with appropriate

DPT with aspirin and plavix and high intensity statin (Rosuvastatin 40mg). Coronary angiogram revealed a >95% obstruction of the mid LAD (Figure 1). A successful PCI of the proximal to mid LAD was performed and a right ulnar TR band was applied. In the post-operative unit 30 minutes after the procedure, the patient was noted to have a small forearm swelling and was diagnosed with a right forearm hematoma due to coronary angiogram. In order to contain the forearm hematoma, a sphygmomanometer cuff was applied, 30 minutes after, it was noted that the hematoma had resolved, however, the patient was noted to have a newly formed petechial rash on the dorsal aspect of the right palm (Figure 2), hence a diagnosis of RSL was established. The sphygmomanometer cuff was released immediately after the rashes were noted. The petechial rashes completely resolved 2 days later without any further intervention.

Table 1. Pertinent laboratory values of the patient on admission

Lab data	Reference range	On admission
COMPLETE BLOOD COUNT		
White blood cell count (10×3/uL)	4.10 -10.10	8.1
Neutrophils (%)	44.5 – 73.4	50.4
Lymphocytes (%)	17.8 – 42.0	19.3
Hemoglobin (g/dL)	12.9 – 16.7	14.0
Platelets (10×3/uL)	153 – 328	164
HEMATOLOGIC		
Prothrombin time (seconds)	11-15	12
Partial thromboplastin time (seconds)	25-40	33
INR	<1.1	0.9
METABOLIC		
Creatinine (mg/dl)	0.66 – 1.25	0.73
Blood urea nitrogen (mg/dL)	9.0 – 20.0	10.0

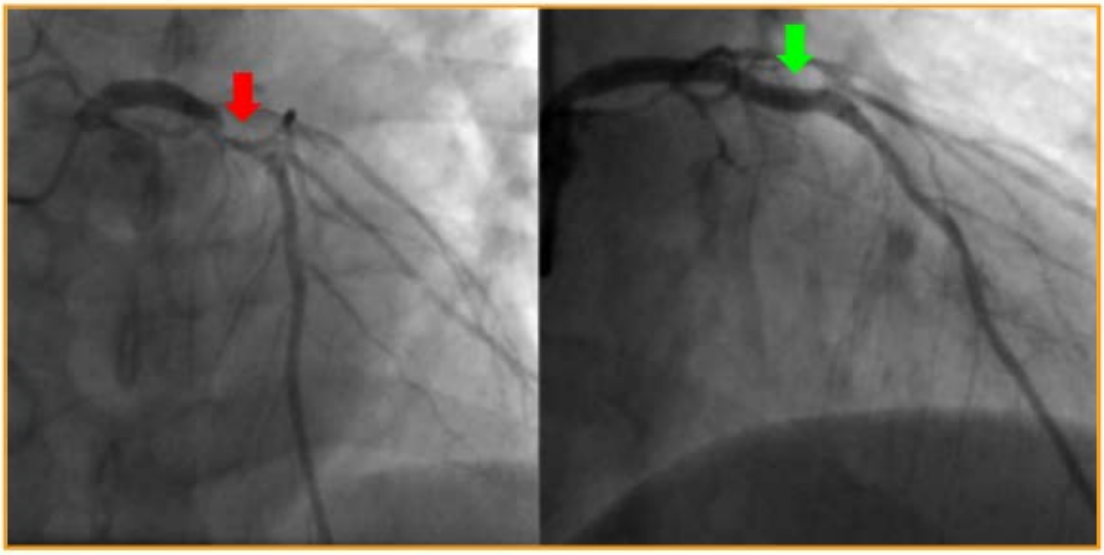

Figure 1. Coronary angiogram showing greater than 95% obstruction of the proximal-mid left anterior descending artery (left) and successful drug eluting placement in the lesion (right)

Figure 2. Rumpel-Leed phenomenon on the dorsal aspect of the right palm

3. Discussion

Multiple cases of RLP associated with coronary angiogram have been reported, the findings of which are summarized in Table 2 [2-6]. RLP has been typically reported in literature after prolonged blood pressure inflations, however, multiple other conditions are known to cause RLP (Table 3) (Figure 3) [7]. Increased capillary fragility, antiplatelet and anticoagulation during the procedure, arterial occlusion due to vascular access sheaths, venous and capillary hypertension due to compressive devices such as trans-radial bands or sphygmomanometer cuffs, venous compression due to forearm/arm hematomas are contributing factors for the development of RLP post-coronary angiogram [2-6]. RLP sign is mostly benign and represents ruptured capillaries leading to petechiae formation [2-6]. RLP is not associated with any major complications or limb loss, and hence rarely demands any intervention directed to reverse the petechiae. Anticoagulation and antiplatelet therapy can be safely continued in these patients after percutaneous coronary intervention. Anticoagulation and antiplatelet reversal is not needed if RLP is observed. Venous return should be facilitated by prompt pressure release in arterial occlusive devices and gentle pressure should be applied over any arm or forearm hematoma to avoid venous/capillary hypertension.

Table 2. Summary of reported cases of Rumpel-Leede phenomenon reported post coronary angiogram

Paper	Ageand Sex	CVD risk factor	Procedure	Access site	Vascular closure	Complications	Antiplatelet used	Anticoagulation	Complete resolution
2018, Rattka et al [2]	69,M	HTN	Coronary angiogram	Left radial	TR band	-	-	-	Yes, after 2 days
2018, Abdullah et al [3]	53,F	-	PCI of RCA	Right radial artery	TR band	-	-	-	-
2018, Sud et al [4]	65, F	-	Two vessel PCI	Right radial artery	Bengal radial compression band	Right forearm hematoma needing BP cuff application	ASA, Ticagrelor	UFH	-
2019, Rhijn et al [5]	62,M	HTN, HLD	PCI	Right radial artery	Sphygmomanometer cuff	-	-	UFH	-
2020, Toufaily et al. [6]	65,F	Smoking, HTN, HLD	PCI of RCA	Left brachial artery access	Brachial band	-	ASA, Plavix	-	Yes, After 2 days
Theetha Kariyanna et al.	53, M	HTN, HLD, DM	PCI of proximal to mid LAD artery	Right ulnar artery	sphygmomanometer cuff	Right forearm hematoma needing BP cuff application	ASA, Plavix	-	Yes after 2 days

M- Male
F- Female
HTN-Hypertension
HLD- Hyperlipidemia
DM- Diabetes mellitus
PCI-Percutaneous intervention
RCA- Right coronary artery
LAD- Left anterior descending
UFH- Unfractionated heparin
ASA-Aspirin
TR band- Trans radial band

Table 3. Conditions associated with RLP [7]

- Elderly patients
- Hypertension
- Diabetes
- Idiopathic thrombocytopenic purpura/ Thrombotic thrombocytopenic purpura
- Platelet dysfunction
- Diabetes Mellitus
- Fat embolism
- Intravenous drug users
- Infectious diseases such as Rocky Mountain spotted fever, dengue fever, meningococcemia
- Disseminated intravascular coagulopathy
- Mechanical trauma
- Connective tissue disorders such as; Ehlers-Danlos syndrome
- Calcium channel blocker usage
- Chronic steroid use
- Drug-induced erythema multiforme
- Leukemia
- End stage liver diseases
- Renal dysfunction

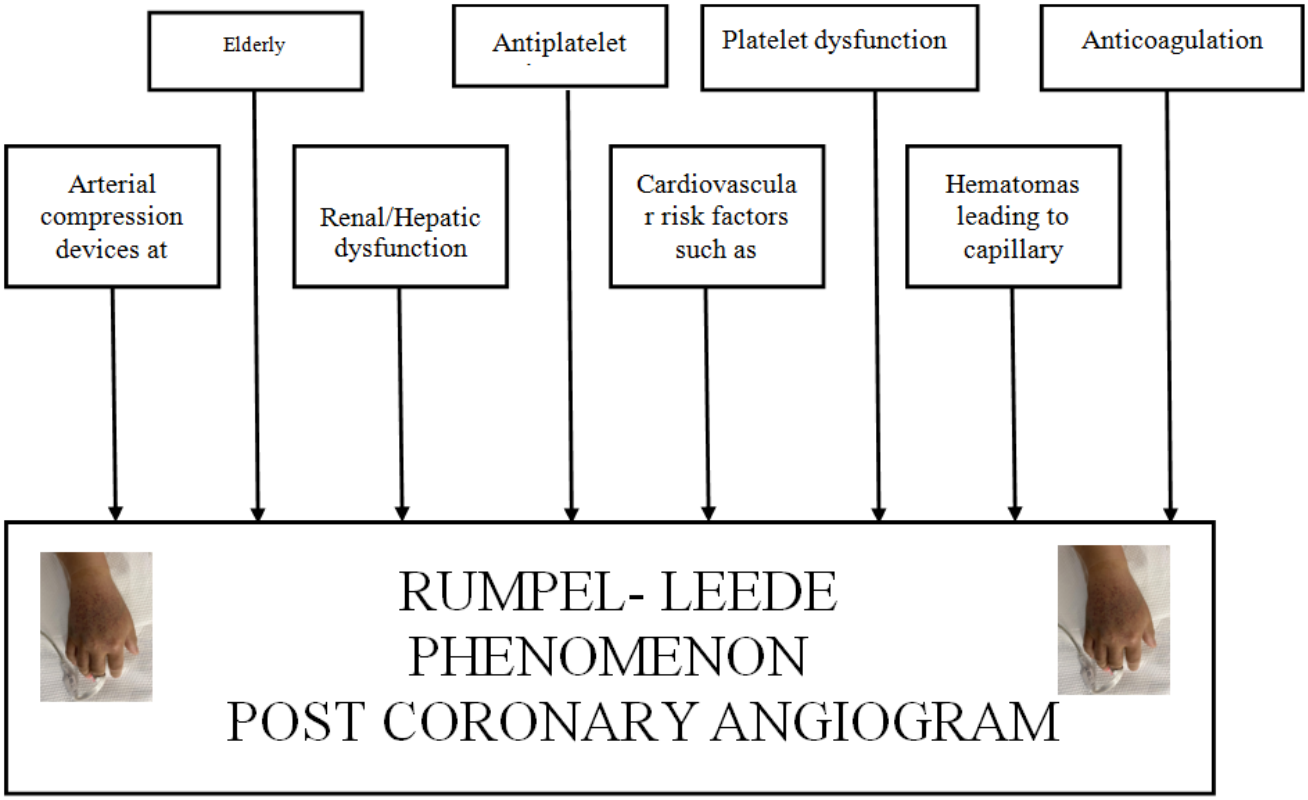

Figure 3. Etiopathogenesis of Rumpel-Leede phenomenon after coronary angiogram

4. Conclusion

RLP post coronary angiogram is a benign phenomenon that can be conservatively managed. RLP does not demand anticoagulation or antiplatelet reversal and resolves spontaneously upon prompt venous decongestion and hematoma management.

References

[1] Wang, K., & Lee, J. (2014). Images in clinical medicine. Rumpel-Leede sign. The New England journal of medicine, 370(1), e1.

[2] Rattka, M., & Rottbauer, W. (2018). Rumpel-Leede Sign After Coronary Angiography. Deutsches Arzteblatt international, 115(6), 82.

[3] Khoury Abdulla, R., & Safian, R. D. (2018). Rumpel–Leede Phenomenon After Radial Artery Catheterization. Circulation: Cardiovascular Interventions, 11(4), e006507.

[4] Sud, M., & Madan, M. (2018). Rumpel-Leede Phenomenon: Acute Dermal Capillary Rupture Complicating Radial Artery Cannulation. JACC: Cardiovascular Interventions, 11(18), 1900-1901.

[5] Van Rhijn, B. D., Vlachojannis, G. J., & Balak, D. M. W. (2019). Petechial purpuric rash after non-invasive blood pressure measurement: Rumpel-Leede sign. BMJ case reports, 12(10).

[6] Toufaily, A. I., & El Sayed, A. A (2020). Rumpel-Leede phenomenon after brachial artery catheterization. Case Report - Interventional Cardiology (2020) 12(4).

[7] Sharma, A., Jharaik, H., & Sharma, R. (2019). Rumpel-Leede (RL) phenomenon. Journal of Medical Science And Clinical Research, 7(6).