Extensive Atherosclerotic Coronary Artery Disease in a Patient with Severe Hypertriglyceridemia

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Introduction

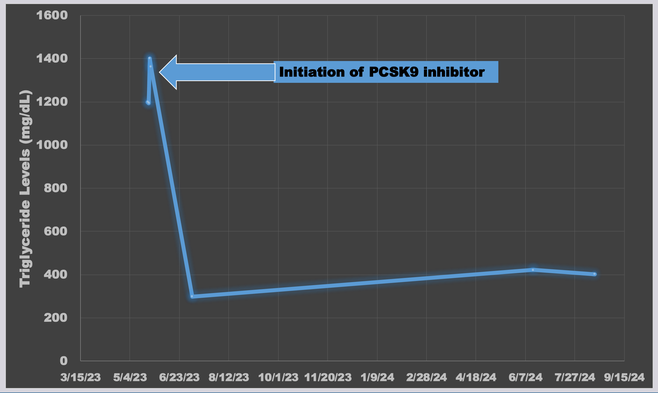
- **Hypertriglyceridemia is a known risk factor for Atherosclerotic Cardiovascular Disease (ASCVD), due to atherogenic properties of TriGlyceride-Rich Lipoprotein particles (TGRLs)[1]. However, severe hypertriglyceridemia (> 1000 mg/dL) is known to be a risk factor for acute pancreatitis. Unfortunately, in patients with severe hypertriglyceridemia, cardiovascular evaluation can sometimes be overlooked, putting these patients at risk for cardiac events**
- **We present a case of a patient with severe hypertriglyceridemia found to have extensive coronary artery disease (CAD)**

Case

- **Our patient is a 41-year-old male, who was admitted to the hospital with severe hypertriglyceridemia. At the time of admission, the principal reason for admission was management of hypertriglyceridemia, given previous history of acute pancreatitis in the setting of severe hypertriglyceridemia while using liraglutide (one episode in 2019)**
- **His past medical history of type 2 diabetes mellitus (on insulin and metformin), dyslipidemia, obesity, and hypertension. GLP-1 receptor agonists had been stopped and avoided due to pancreatitis, and SLGT-2 inhibitor was stopped due to ketotic picture during the admission for pancreatitis. His family history was notable for a history of CAD in his mother who passed away due to cardiac complications of CAD**
- **For his dyslipidemia, he had previously been managed using statin (atorvastatin was switched to rosuvastatin), fenofibrate, ezetimibe and icosapent ethyl**
- **His triglyceride level was 7026 mg/dL. He had no abdominal pain at the time, and lipase and imaging studies obtained, with the lack of typical symptoms, excluded the diagnosis the diagnosis of pancreatitis. He was initiated on intravenous insulin protocol for treatment of hypertriglyceridemia, and levels settled to 1364 mg/dL**
- **Given his medical and family history, he was initiated on a PCSK9 inhibitor in addition to his current therapy (initially alirocumab and later evolocumab), and referred for cardiology evaluation as outpatient**

Results

Date	5/22/23	5/23/23	5/24/23	5/25/23	7/6/23	6/15/24	8/16/24
Triglyceride levels	1,200	1,195	1,401	1,364	299	422	403



Cardiac imaging and procedures

Artery	Lesions	Volume / mm³	Equiv. Mass / mg*	Score
LM	3	310.4	---*	323.5
LAD	12	756.8	---*	994.7
CX	5	24.8	---*	25.6
RCA	9	265.7	---*	291.6
Ca	0	0.0	---*	0.0
Total	29	1357.8	---*	1635.4

Figure 1: *Coronary CT Angiography and Plaque Analysis*. Top: CT images of LAD, RCA, and LCX arteries show calcified and non-calcified plaques. Bottom: Quantitative plaque burden summary for LM, LAD, LCX, and RCA, with the LAD showing the highest plaque burden and RCA . Total plaque score across all arteries is 1635.4.

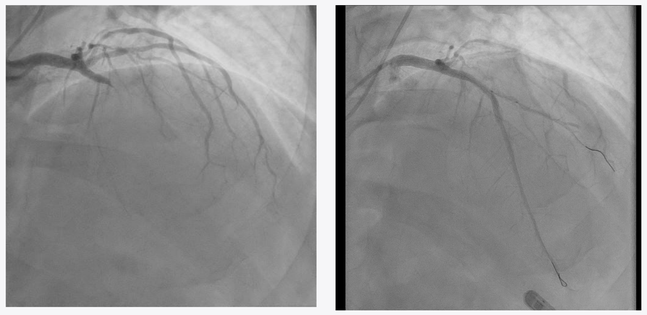


Figure 2: *Coronary Angiography of the Left Coronary Artery.*. Angiographic images show the left coronary artery before (left panel) and after (right panel) intervention.

Outcomes

- **The patient underwent cardiac catheterization following CT angiography, which revealed right-dominant circulation with three-vessel CAD, including a 100% chronic occlusion of the proximal left anterior descending artery (LAD), 50% narrowing of the ramus intermedius, and non-hemodynamically significant stenoses in the right coronary artery (RCA) and left circumflex artery (LCx). The patient underwent successful percutaneous coronary intervention (PCI) of the proximal LAD with full restoration of TIMI 3 flow**
- **With continued use of PCSK9 inhibitors (in addition to other medications), his triglyceride levels have remained consistently below 500 mg/dL**

Conclusions

- **In contrast to the common misconception about individuals with severe hypertriglyceridemia, a growing body of evidence suggests that patients with severe hypertriglyceridemia, not only have increased risk for pancreatitis, but can also have increased risk of CAD[2-4]. This includes individuals with familial chylomicronemia syndromes[3-4], likely related to atherogenicity of different "subtypes" of TGRLs and their products.**
- **This case provides a valuable reminder to clinicians to consider cardiac risk evaluation and management in patients with severe hypertriglyceridemia (likely multifactorial chylomicronemia syndrome based on his history), and not only for pancreatitis risk. In this instance, the patient, with a significant family history of CAD, was not evaluated, likely due to his young age and the common misconception about severe hypertriglyceridemia . Given the extent of his disease, the outcomes could have been devastating**
- **In all patients with hypertriglyceridemia, regardless of the severity, especially in patients with additional risk factors, it is of utmost importance to give attention to cardiac risk evaluation, to reduce cardiovascular events**

References

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