

## 155. A Case of Cardiac Tamponade Occurring After Moderna Vaccine

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### Body

**Background:** A patient presents with cardiac tamponade 2 days after his 1st dose of Moderna vaccine. Interval follow-up scans revealed a mediastinal mass as the cause of his effusion.

**Case:** Our patient is a 42-year-old gentleman. He has no significant past medical history of note. He received his 1st dose of Moderna vaccine on 16th June 2021 at 1 pm and started noticing chest pain and shortness of breath at 8 pm the same evening. He visited his local general practitioner on the 17th June 2021 and was given some symptomatic medications and asked to rest at home. As his symptoms were progressively worsening, he came to the emergency department in our hospital on the 18th June 2021.

He had a blood pressure of 112/93 mmHg and a heart rate of 110/min when he was first reviewed in the emergency department. His electrocardiogram showed widespread ST-elevations consistent with pericarditis and his chest X-ray showed a globular looking heart. An echocardiogram performed showed large pericardial effusion with tamponade physiology. A pericardiocentesis was performed which drained hemo-serous fluid. 700 mls was drained initially with immediate hemodynamic improvement. He developed shortness of breath shortly after, likely from pericardial decompression syndrome and the drain was clamped.

His systemic lab tests show raised white blood cell count of  $13.07 \times 10^9$  ( $3.37 - 11.03 \times 10^9/L$ ) with absolute neutrophil count of 10.41 ( $1.13 - 6.86 \times 10^9/L$ ) and absolute monocyte count of 1.42 ( $0.21 - 0.89 \times 10^9/L$ ). Sodium was low at 127 ( $134 - 146$  mmol/L) with otherwise unremarkable renal function and electrolytes. Prothrombin time was raised at 16.5 ( $11.7 - 14.1$  sec) with an INR of 1.41. Inflammatory markers show a normal procalcitonin 0.40 ( $<0.50$  ng/mL) and elevated high sensitive C reactive protein 125.7 ( $0.0 - 5.0$  mg/L). His thyroid function test, antinuclear antibody, anti-dsDNA antibody and HIV screening tests are negative. Troponin was slightly elevated at 74.1 ( $\leq 34.2$  pg/mL) and the second set remained stable at 69.4. A COVID-19 RNA PCR swab and a respiratory virus panel screen sent off were negative.

Pericardial fluid test results are as follow. Fluid pH 7.159, glucose 2.8 mmol/L, protein 62 g/L/ albumin 38.2 g/L, LDH 1080 U/L. Fluid cell count 14,186 nucleated cells, 2868000 RBC. Differential count 74% neutrophil, 7% lymphocyte, 17% monocyte, 2% eosinophils. Fluid cytology showed predominantly blood and a few reactive mesothelial cells occurring singly and in small clusters. No malignant cells seen. Tests for tuberculosis were also negative.

A pan CT thorax, abdomen and pelvis scan was performed but did not find any lesions suspicious of malignancy. A CT coronary angiogram also did not find any significant coronary artery stenosis.

We did a thorough evaluation for possible underlying aetiologies such as malignancy, possible infection or autoimmune disease. The tests that came back did not support any of those underlying conditions. The overall clinical impression at this point in time was that of pericarditis precipitated by the Moderna vaccine. He was initiated on Ibuprofen and Colchicine on 22nd June 2021. He had low grade fever during the admission with the last spike of fever on the 30th June 2021. His pericardial drain was removed on

the 25th June 2021 as there was minimal drainage although a localised effusion was present on repeat echocardiogram. A total of 2788 mls of fluid was drained over a course of 7 days.

His laboratory tests were repeated on 28th June 2021 which showed normalisation of his blood counts and C reactive protein. This supported an acute event precipitating the accumulation of pericardial fluid.

A Cardiac MRI performed on the 30th June 2021 shows a large loculated pericardial effusion encompassing the posterolateral aspect of the left ventricle with both visceral and parietal pericardium thickening and diffuse delayed enhancement of the pericardium. Maximum thickness of pericardium over the right ventricle measures 6 mm. A mass is noted in the superior pericardial recess and transverse sinus. This measures 60 mm x 56 mm x 50 mm. It is homogenous and isointense on cine images. It is hyperintense on T2 Stir images and hypointense in early and delayed enhancement images. The differential for this mass included that of an organised hematoma although a malignant or non-malignant mass could not be excluded. Interval scan was recommended.

He was discharged well on the 3rd July 2021 from the hospital and planned for a review in clinic in a month's time. He was first reviewed on 13th August 2021 in the clinic and a beside echo did not show any recurrence of effusion. A repeat cardiac MRI was then scheduled and performed on the 20th October 2021. This now shows a large heterogenous mediastinal mass. This extends superiorly up to the arch of aorta and inferior to the left atrioventricular groove. It measures 104 mm by 154 mm by 104 mm. On contrast injection, first pass perfusion showed no significant enhancement of the mass. On early enhancement images, mild patchy enhancement if seen. On diffuse enhancement, there is diffuse patchy delayed enhancement. There is mass effect with compression seen on the superior vena cava, left superior and left inferior pulmonary vein. The impression was a possible lymphoma and a biopsy was recommended. His last clinic review was on the 22nd October 2021. He had symptoms of shortness of breath on exertion at that point in time. However, due to cost concerns as the patient was a foreigner hence not eligible for medical subsidies, he declined further investigations and went back to his home country.

**Discussion:** Given the timeline and absence of other suggestive findings, the initial working diagnosis was that of pericarditis complicated by cardiac tamponade precipitated by Moderna vaccination. The evidence against was the rapidity of the symptoms which arose just hours after the 1st vaccine dose. The FDA has recognised the risk of myocarditis and pericarditis post vaccination since 25th June 2021. With more and more vaccinations and boosters being administered, the number of patients who present with possible post vaccine adverse events has also increased. It is important to consider other possible aetiologies when evaluating such patients so as not to miss potential treatable diseases. Not all adverse events post vaccine are vaccine related.

