Case study

Vascular consideration with COVID-19 Vaccination: Clinical Case Report

Abstract :

Adverse cardiovascular side effects of the COVID -19 vaccine include myocarditis/pericarditis, vaccine induced thrombotic Thrombocytopenia (VITT) and thrombosis, which often related to low platelet levels and VITT in the setting. A 60-year-old female presented to our Emergency Department (ED) after cardiopulmonary resuscitation due to Asystole at home. The patient underwent a chest computed tomography (CT) scan that revealed bilateral pleural effusion without pulmonary embolism. The cardiovascular complications have been reported with both COVID-19 and its vaccination. The COVID-19 vaccines have adverse side effects, which are rare but also sometimes fulminant too.

Keywords: cardiovascular side effects, COVID -19 vaccine, chest computed tomography, acute respiratory syndrome

Introduction:

"Coronavirus disease 2019 (COVID-19), the illness caused by severe acute respiratory Syndrome Coronavirus 2 (SARS-CoV-2) continue to cause significant morbidity and mortality over the World" [1,2] .

"Globally, numerous vaccines have been developed against COVID-19. From December 2020 through March 2021, the European Medicines Agency approved four vaccines on the basis of randomized, blinded, controlled trials: two messenger RNA–based vaccines — BNT162b2 (Pfizer–BioNTech) and mRNA-1273 (Moderna) — that encode the spike protein antigen of SARS-CoV-2, encapsulated in lipid nanoparticles; ChAdOx1 nCov-19 (AstraZeneca), a recombinant chimpanzee adenoviral vector encoding the spike glycoprotein of SARS-CoV-2; and Ad26.COV2.S (Johnson & Johnson/Janssen), a recombinant adenovirus type 26 vector encoding SARS-CoV-2 spike glycoprotein"[3,4,5] .

"Most people become Moderna and Pfizer-BioNTech, Although certainly side effect may occur, the benefit greatly outweigh the risks" [6].

"Adverse cardiovascular side effects of the COVID -19 vaccine include myocarditis/pericarditis, vaccine induced thrombotic Thrombocytopenia (VITT) and thrombosis, which often related to low platelet levels and VITT in the setting" [7,8].
"VITT is a new phenomenon with devastating effects for otherwise healthy young adults and requires a thorough risk–benefit analysis" [13]. "There may be an immune-mediated mechanism at the root of thrombosis, with protagonist antibodies against the PF4–polyanion complex. VITT-associated PF4 antibodies interact with the heparin-binding site. These antibodies are therefore independent from heparin. The immune complexes, formed from the binding of PF4 to antibodies, activate platelets through FcγRIIa receptors, causing thrombocytopenia and thrombosis secondary to the activation of the coagulation pathway" [14,15,16].

Case report (history/examination):

A 60-year-old female presented to our Emergency Department (ED) after cardiopulmonary resuscitation due to Asystole at home. She had been having progressive shortness of breath over 2-3 Months that worsened acutely on the admission day with no significant past medical history. She got the COVID vaccination 3 times.

On arrival to ED Patient was intubated. She was afebrile. An electrocardiogram was performed, which showed sinus rhythm with a left axis, normal intervals and negative T wave over II,III,aVF and V1-4.

An arterial blood gas showed the following results: pH 6.7 (normal 7.35-7.45), pCO2 84 (normal 37-43 mmHg), bicarbonate 6.5 (normal 22-26 mmol/L), lactate 14 (normal 0.5-2.5 mmol/L), sodium 137 (normal 134-144 mmol/L), potassium 3.8 (normal: 3.5-5.5 mmol/L), and anion gap 21.9 mmol/L. There was an absence of ketones in the urinary dipstick, but positive for protein and glucose. Laboratory evaluation revealed markedly elevated creatinine level 2.2 (normal: 0.7-1.1 mg/dl) and high sensitive troponin-I (hs-TnI) 2480 ng/l (normal: 2.3-11.6 ng/l).

Takotsubo cardiomyopathy was ruled out through Cardiac-MRT, as seen in the MRT-Images(It was no myocardial scar) and Ventriculography(It was only a globaly hypokinesia).

The patient underwent a chest computed tomography (CT) scan that revealed bilateral pleural effusion without pulmonary embolism. Coronary Angiogram was without a significant epicardial coronary artery disease. For further evaluation we measured the microcirculatory resistance (IMR=52) and coronary flow reverse (CFR =1.3) which were pathologic .

She was immediately started with Continuous Veno-Venous Hemodiafiltration(CVVHDF),then with the dialysis 3 times weekly for six weeks, which could be stopped, because of improvement in value of GFR, which was 61 ml/min/m^2 , urine output > 100 ml /hour and creatinine 1.3 mg/dl .

Because of the unclear cause of her accelerated decrease in kidney function with need for the continuous dialysis a kidney biopsy was performed that showed microthrombi and lymphatic infiltrates as an expression of Vaccination Complication.

Brain CT performed on the first day of admission showed a subacute medullary lesion on the left periventricular side. The Brain MR showed multiple small subacute ischemia's, mainly in the centrum semiovale both sides.

Discussion:

"The cardiovascular complications have been reported with both COVID-19 and its vaccination. Vaccination has a significant effort on the prevention of severe SARS-CoV-19 Infection and is complications" [(9)].

"The extra cause of the vaccine complications is not exactly understood, but they are likely due to inflammatory immune system response to components of the vaccine that attack cells and tissue in the body" [(10)].

Blood clots can form in veins and arteries. Typical locations are in legs and hands, less common are in the abdominal organs or brain[(11)].

The complications are really rare, as example the incidence of the VITT is observed in 1/100.000 vaccine exposures[(12)].

Conclusions:

The COVID-19 continue to cause significant morbidity and mortality over the world. The COVID-19 vaccines have adverse side effects, which are rare but also sometimes fulminant too.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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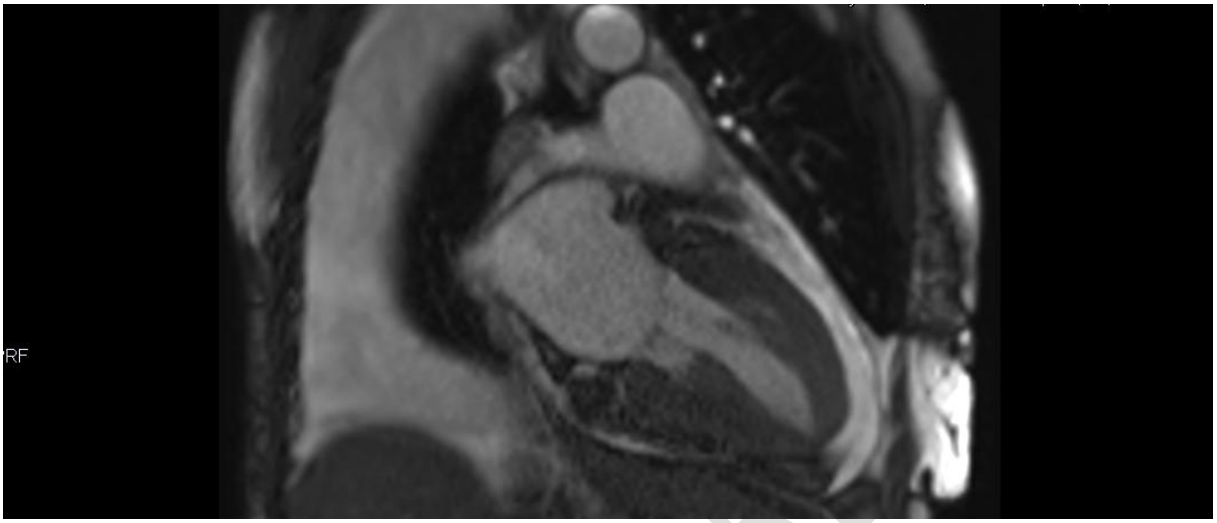

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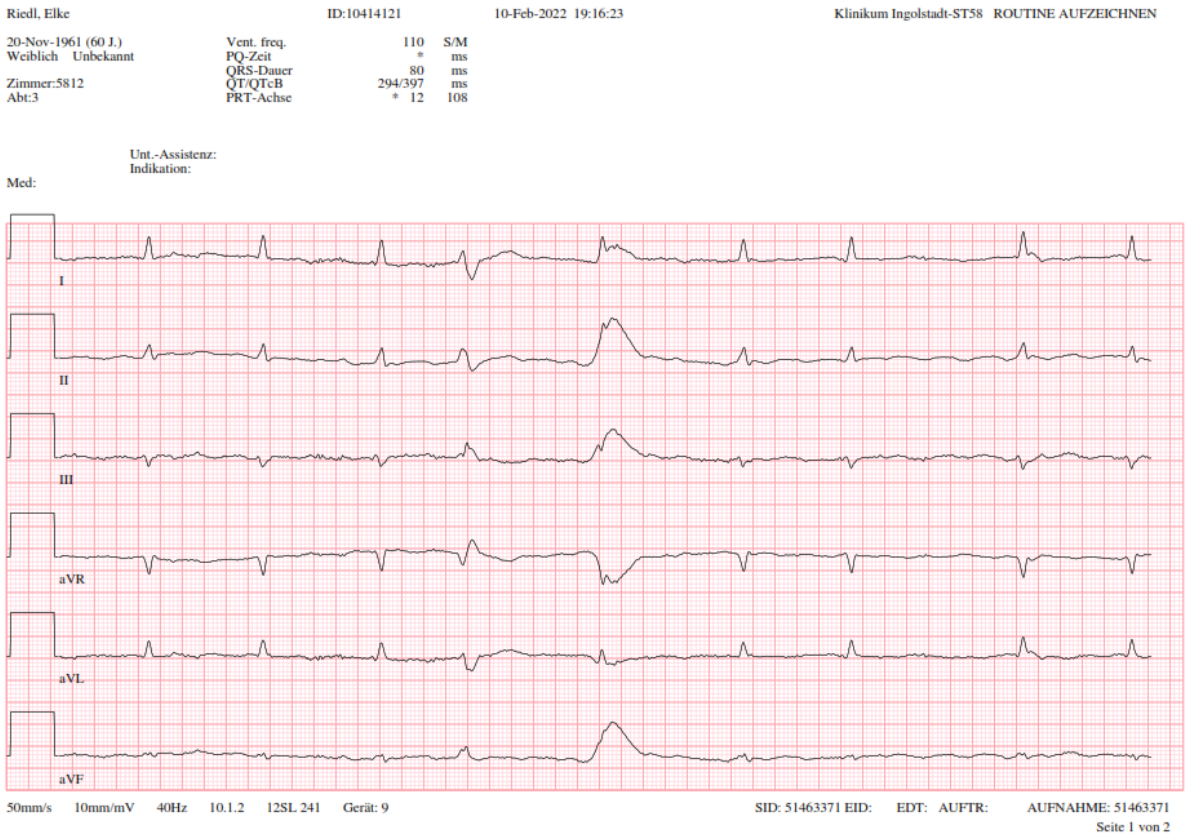

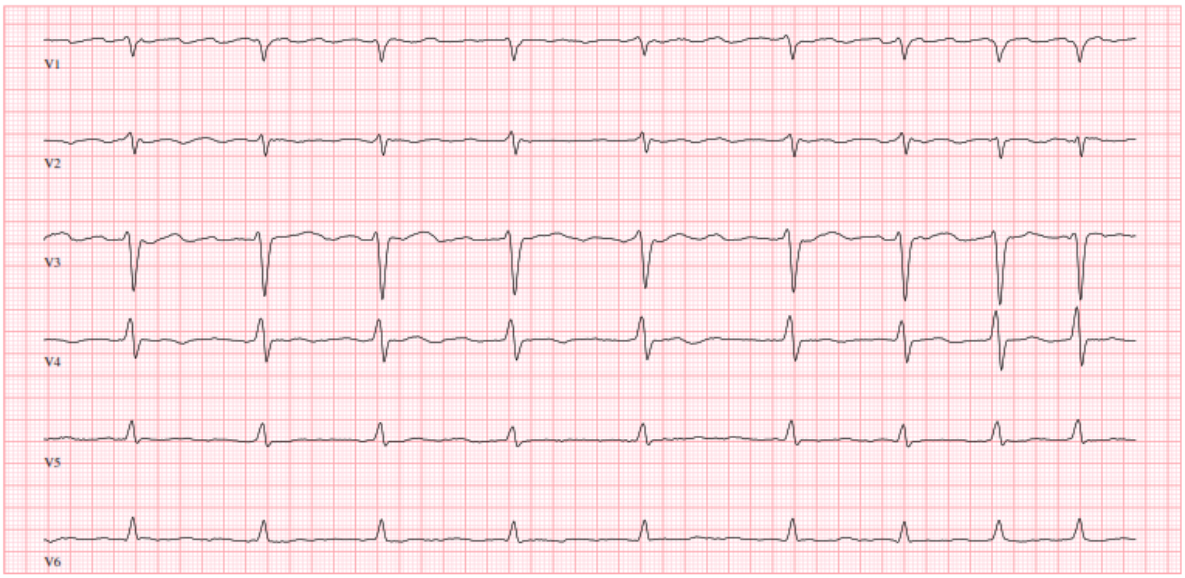

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Weiblich Unbekannt

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Abt:3

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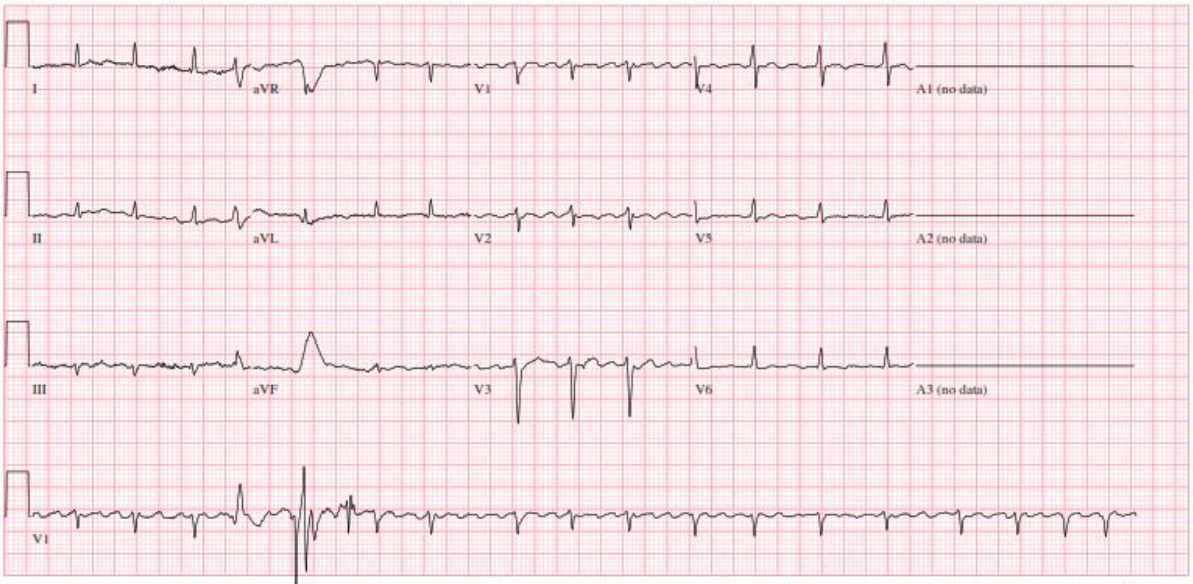

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20-Nov-1961 (60 J.)
Weiblich Unbekannt

Zimmer:9308
Abt:3

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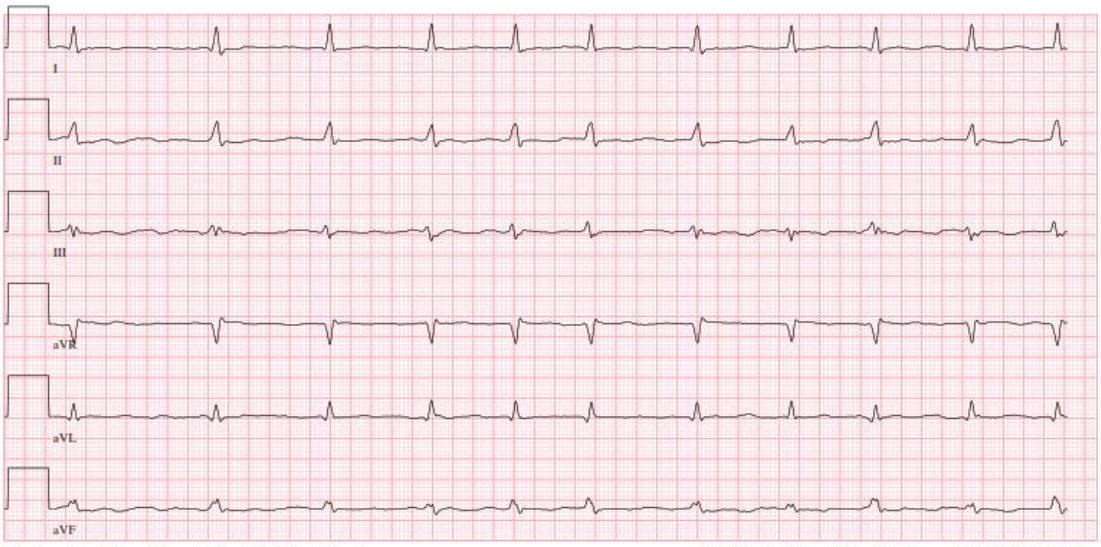

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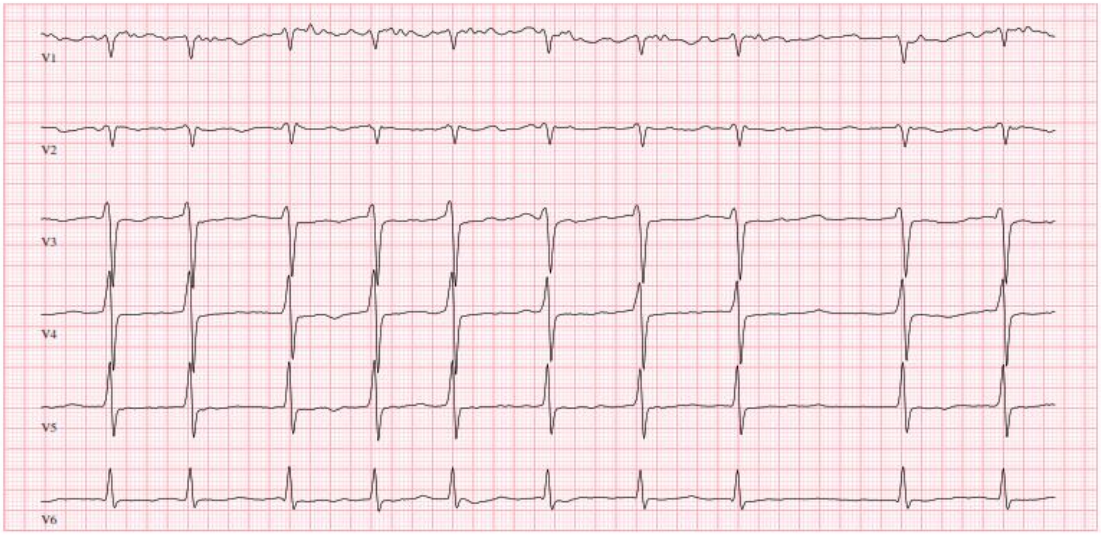

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Weiblich Unbekannt

Zimmer:9308
Abt:3

Vent. freq.	125	S/M
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Unt.-Assistenz:
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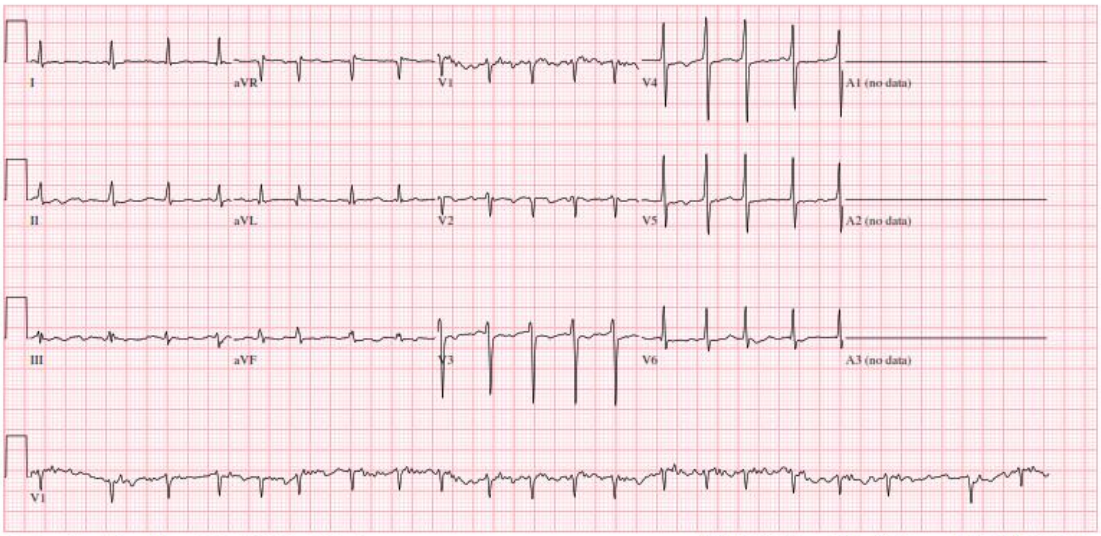
Med:



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Riedl, Elke
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Abteilungsnr. : 3

125 /min
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QRS :	80 ms
QT / QTcBaz :	274 / 395 ms
PQ :	-- ms
P :	-- ms
RR / PP :	480 / 594 ms
P / QRS / T :	-- / 20 / 269 Grad

Vorhofflimmern [chaotische Vorhofaktivität und stark schwankendes RR-Intervall]
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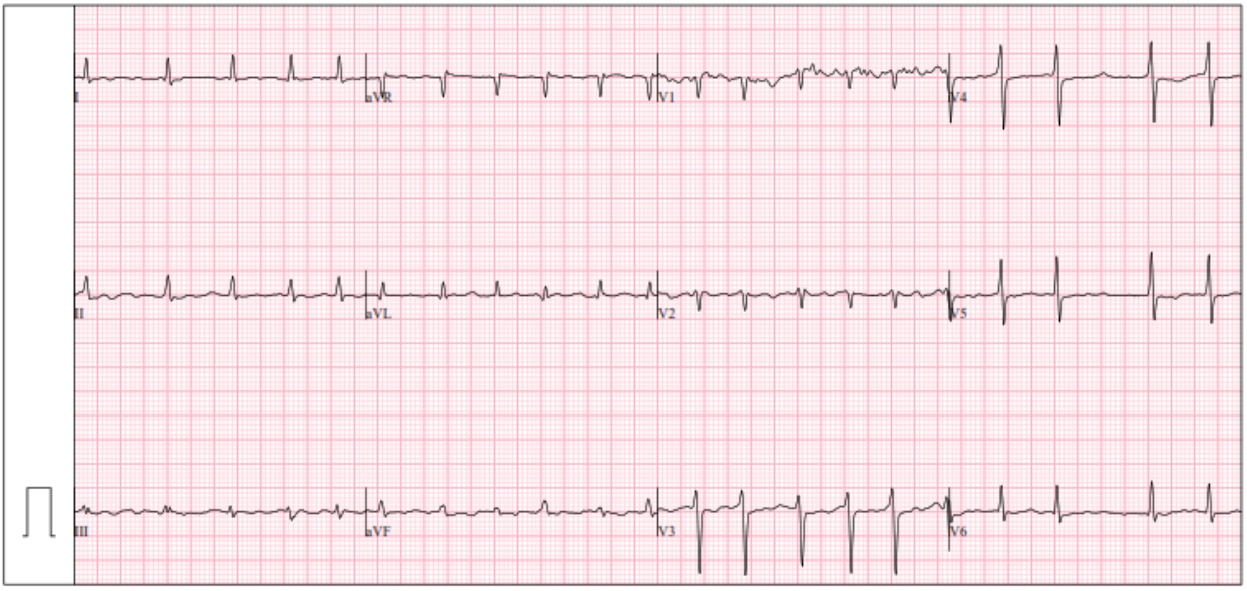
abnormales EKG



Unbestätigt

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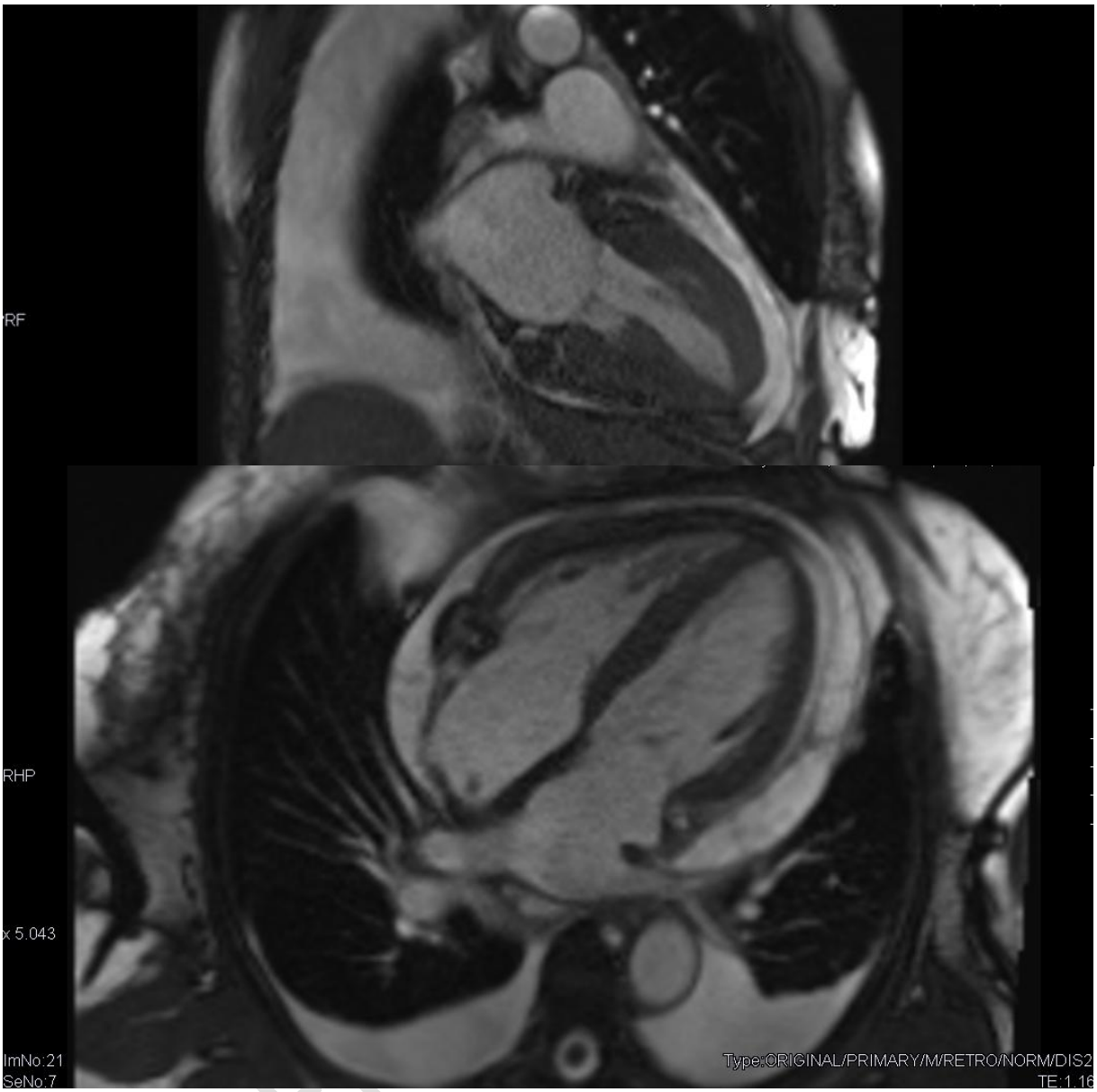
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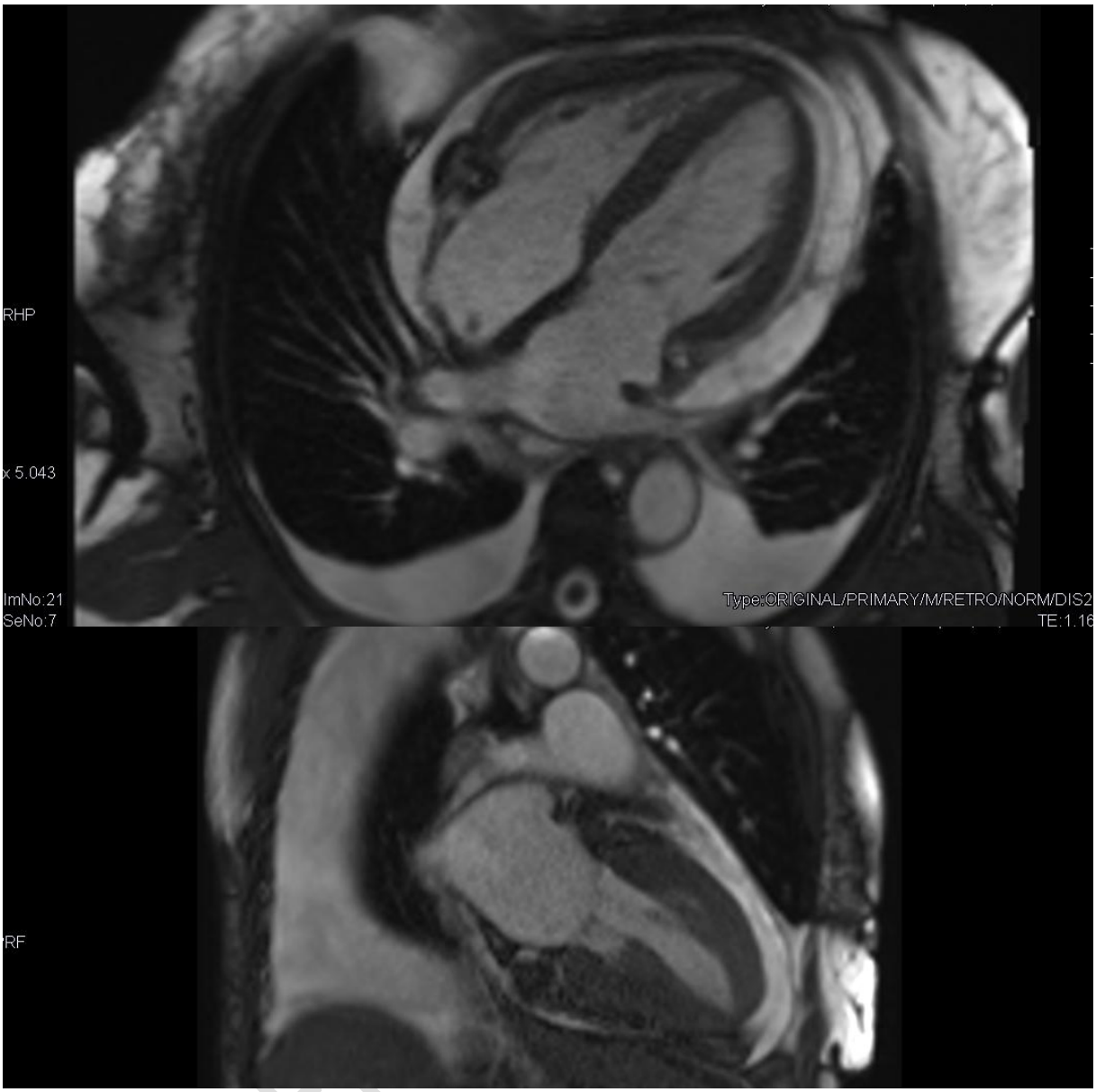
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