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Right coronary artery spasm following anastomotic leak status post-esophagectomy

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Introduction

- MINOCA (Myocardial Infarction with Non-Obstructive Coronary Arteries) is clinically defined by the presence of the universal acute myocardial infarction (AMI) criteria, absence of obstructive coronary artery disease ($\geq 50\%$ stenosis), and no overt cause for the clinical presentation at the time of angiography (eg, classic features for takotsubo cardiomyopathy)(1)
- Although the prevalence is estimated to be between 5-15%, it's incidence in patients undergoing non-cardiac surgery, is not established(2)
- Etiologies such as coronary artery vasospasm, acute thrombosis at site of a non-obstructive eccentric plaque thrombus, takotsubo cardiomyopathy, coronary microvascular dysfunction, viral myocarditis, thrombophilia, and coronary artery embolism, have been identified as culprits for MINOCA(3)
- Known post operative complications s/p Esophagectomy include bronchopneumonia, respiratory failure, thromboembolic complications, myocardial ischemia(secondary to underlying vascular occlusive disease), anastomotic leakage, sepsis, gastric conduit necrosis, chylothorax, recurrent laryngeal palsy etc.(4)
- Anastomotic leakage may cause mediastinitis, which can progress to sepsis
- Pericarditis secondary to mediastinitis is an unusual presentation. Even more bizarre is coronary artery vasospasm secondary to pericarditis, that manifests as transient EKG changes suggestive of ischemia/infarction.
- We present here a case of such bizarre and rare presentation, which eventually led to the diagnosis of MINOCA

Case Presentation

- A 65-year-old male, presented to our hospital, with past medical history significant for esophageal adenocarcinoma, COPD, 45 pack year tobacco history and obesity(BMI 36.6).
- **Pre-hospital Course**
 - Patient had undergone esophagectomy, pyloroplasty and feeding jejunostomy tube placement at an outside hospital, which was complicated by an anastomotic leak
 - This was followed by fluid accumulation in chest cavity requiring thoracocentesis with chest tube placement. Patient continued to have drainage for which he underwent thoracotomy, washout and redo of esophageal anastomosis. During the procedure damaged right mediastinal tissue was also removed.
 - Patient continued to have fever, elevated white cell count with cultures positive for *methicillin-resistant Staph epidermidis*, *Candida albicans*, *Influenza A*
 - Broad spectrum antibiotics were initiated but patient continued to have bilious drainage with concern for anastomotic leak
 - His post operative course was also complicated by new onset atrial fibrillation and delirium
 - At this point patient was transferred to our institution, for further care and management
- **Hospital Course**
 - Patient transferred to our center with O2 via nasal cannula, hemodynamically stable in sinus rhythm, with NG tube, J-tube & chest tubes in situ
 - At our center, patient underwent a redo thoracotomy with pulmonary decortication, complete gastrectomy and creation of esophagostomy
 - He was transferred to ICU intubated, with vasopressor support and in sinus rhythm
- **Postop Day 0**
 - EKG showed transient PR depression with diffuse ST elevation followed by ventricular tachycardia, then atrial fibrillation which resolved spontaneously!
 - At this point, patient was not a candidate for dual anti-platelet therapy/IV heparin/cath procedure as he was post surgical
 - **Electrolytes**(drawn at time of event): K 5.3, Mg 1.6, Phos 5.2. S/p Calcium gluconate, D50 and insulin for hyperkalemia, S/p Mag sulfate
 - Echocardiogram after the event showed normal LV systolic function globally with ejection fraction (EF) 70%
 - Differential diagnosis at this point included acute coronary syndrome, coronary vasospasm, coronary plaque rupture and recanalization secondary to pericarditis

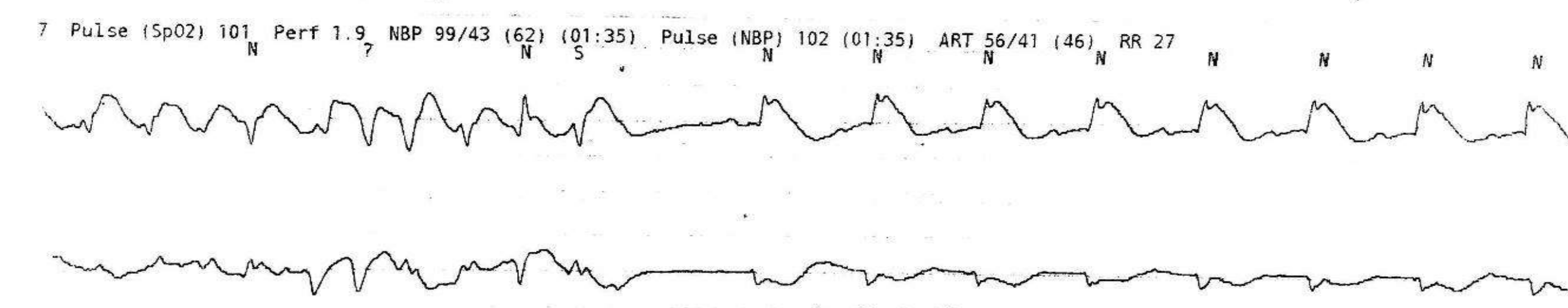


Figure 1. Post op Day 0

- **Postop Day 4**
 - EKG showed ST elevation in lead II, ST depression in V1V2, 1st degree AV block with conversion to atrial fibrillation (AF) with rapid ventricular rate, without ST elevations
 - Again potential trigger was: RCA vasospasm secondary to pericarditis
 - Decision made to proceed with **Left heart catheterization(LHC)**. LHC was negative for obstructive CAD, but significant for moderate hypokinesia of the apical and periapical wall, EF 35-40% .
 - Post catheterization low intensity heparin and Nitroglycerine infusions initiated for coronary vasospasm

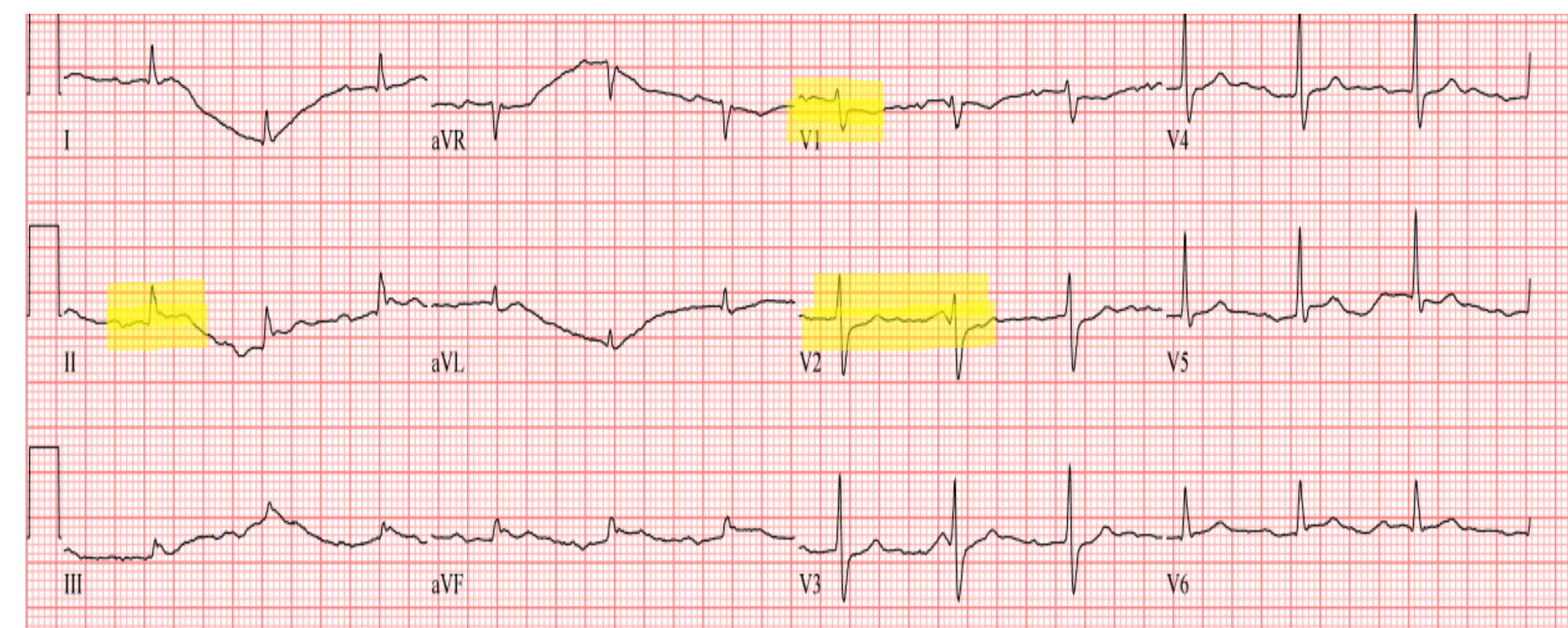


Figure 2. Post op Day 4

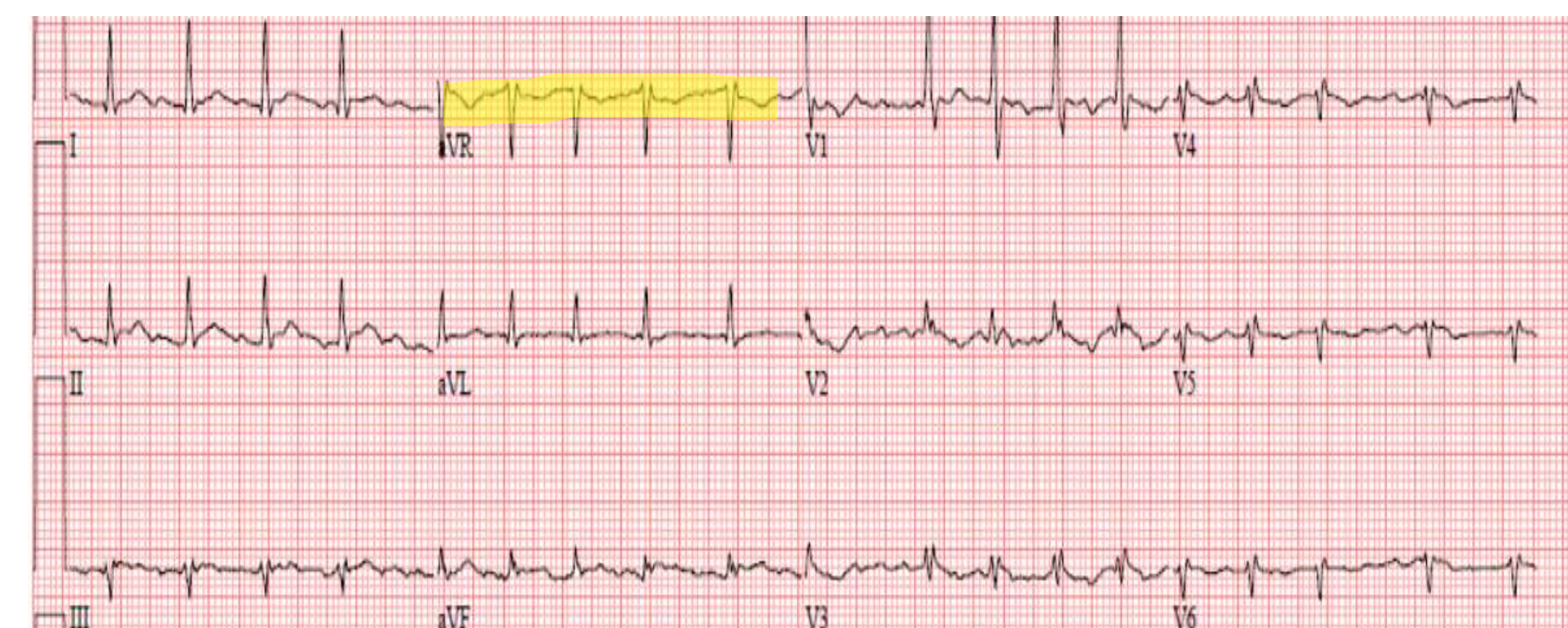


Figure 3. Post op Day 4

- **Postop Day 7**
 - Patient had bradycardia with HR in 40s, SBP 70mmHg: non-responsive to atropine
 - EKG also significant for ST elevation in Lead II, III, aVF
 - EKG also concerning for complete AV block. Dopamine & NTG infusion initiated.
 - Dopamine discontinued to arrhythmogenic potential. NTG infusion switched to Isordil & amiodarone eventually.

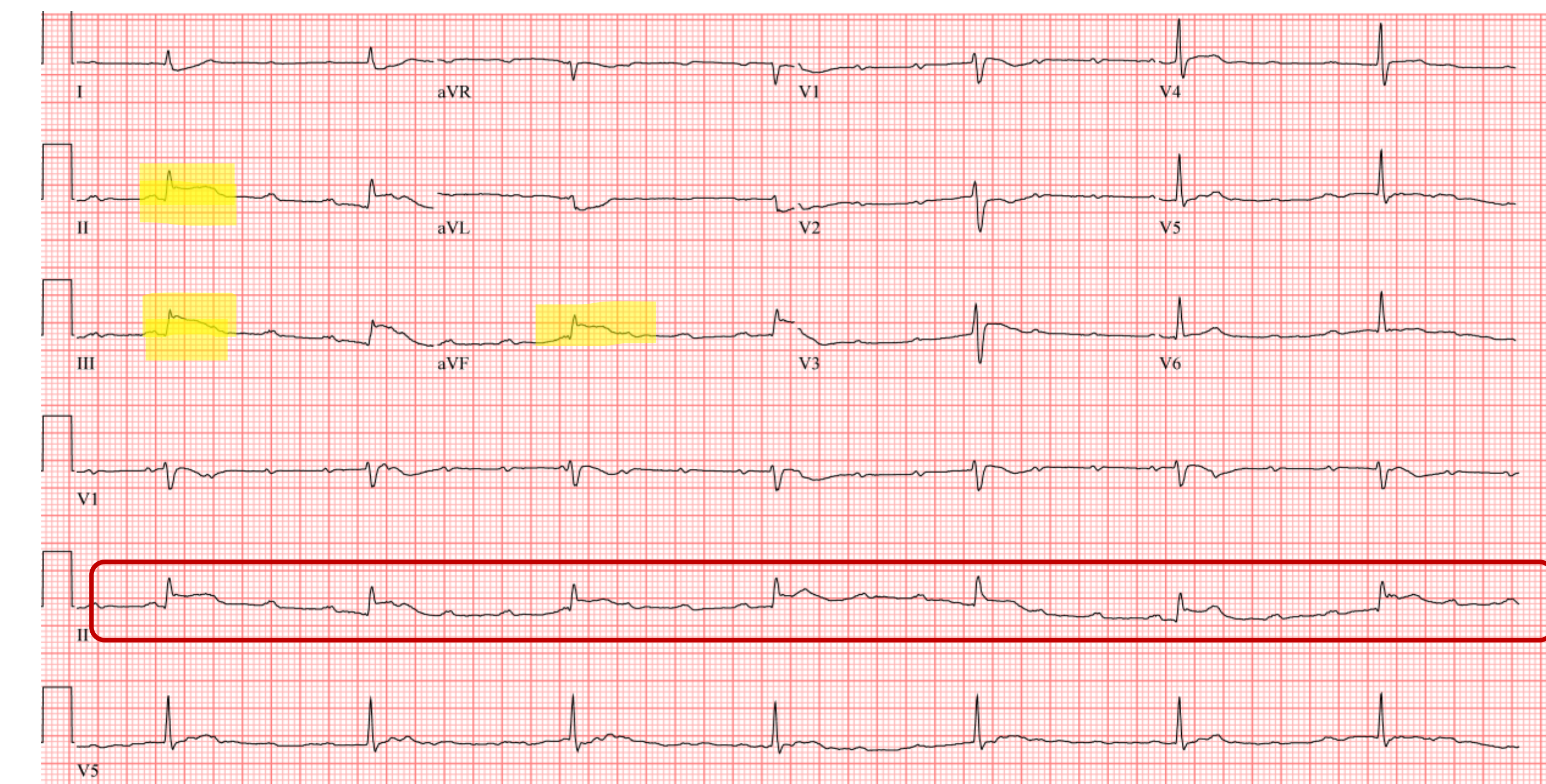


Figure 4. Post op Day 7

Discussion

- The all-cause 12-month mortality for patients with MINOCA is estimated to be around 4.7% (3)
- Major adverse cardiac events (MACE; death and MI) in patients with MINOCA over a period of one year, have been shown to be comparable to patients with AMI due to single- or double-vessel coronary artery disease(CAD).
- MI/ischemia secondary to CAD, is a known and well anticipated complication in post surgical setting for major surgeries
- The usual findings are consistent and evident on an EKG
- Pericarditis secondary to mediastinitis, post anastomotic leak, is in itself a rare presentation after esophagectomy(5). Besides it's usual clinical presentation, pericarditis can also potentially trigger coronary vasospasm.

Conclusion

- **Transient ST elevations secondary to coronary vasospasm, can be an easily missed event in the post operative setting.**
- Troponins are certainly not helpful in this situation.
- Therefore high vigilance for presentation of MI in form of MINOCA, should be practiced, with regards to complicated post surgical patients, such as ours.

References

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