

Broken-Hearts and Mended Minds: A Case of Successful ECT Treatment Following Cardiac Injury

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BACKGROUND

There are no absolute contraindications to ECT¹ and it is a safe procedure with an estimated mortality rate of 0.42 per 1,000 patients¹, or 2.1 per 100,000 treatments². During the procedure there are substantial shifts in the autonomic nervous system³. An increase in parasympathetic activity causes bradycardia and hypotension⁴, with up to 40.1% of patients experiencing transient asystole lasting upwards of 5 seconds¹. The sympathetic surge that follows causes hypertension and tachycardia, followed by a final postictal increase in parasympathetic tone⁴.

Though well tolerated, with some studies indicating long-term mortality benefits of ECT⁴, the most common complications are cardiovascular, and 29% of fatalities¹ are cardiac-related. Additionally, while an estimated 8% of patients may experience cardiovascular complications, this figure is 55% of patients¹ with cardiac history, making cardiovascular health of great importance when determining a course of treatment.

We present a case of a patient who underwent ECT without complications following development of myopericarditis in the setting of clozapine use and NSTEMI, two conditions for which we were unable to find any protocols.

| Treatment Number | Pre-Medication (Glycopyrrolate +/- toradol) | Induction Agent (Propofol) | Muscle Relaxant (Succinylcholine) | Strength | Motor/EEG Seizure Duration |
|------------------|---|----------------------------|-----------------------------------|----------|----------------------------|
| 1 | none | 80mg | 40mg | 30% | unclear, 58s |
| 2 | none | 70mg | 40mg | 30% | 30s, 43s |
| 3 | Gly 0.2mg | 70mg | 40mg | 30% | 47s, 75s |
| 4 | Gly 0.2mg | 70mg | 30mg | 45% | 21s, 46s |
| 5 | Gly 0.2mg | 70mg | 30mg | 45% | 33s, 56s |
| 6 | Gly 0.2mg | 70mg | 30mg | 45% | 29s, 36s |
| 7 | Gly 0.2mg | 70mg | 30mg | 45% | 26s, 39s |
| 8 | Gly 0.2mg + Tor 30mg* | 70mg + 30mg | 40mg | 45% | 13s, 43s |
| 9 | Gly 0.2mg + Tor 30mg | 100mg | 40mg | 45% | 25s, 40s |
| 10 | Gly 0.2mg + Tor 15mg | 100mg | 40mg | 45% | 16s, 20s |
| 11 | Gly 0.2mg + Tor 15mg | 100mg | 40mg | 45% | 17s, 23s |

Table 1. *no post-medication used except for treatment 8 when toradol 30mg given due to headache

CASE

A 63 year old man with a history of type 2 diabetes, bipolar 1 disorder, alcohol use disorder in remission, and 3 previous psychiatric admissions, was visiting New York City and admitted to our hospital due to suicidal ideation with plan and intent after a concerned citizen activated EMS. The patient had no family or social supports in the area, had been on several prior medication trials (fig 1), and was several hundred miles from home.

While on the psychiatric unit, the patient was started on clozapine and valproic acid, which were titrated to clozapine 50mg daily and 150mg Qhs and VPA 150mg Qhs. On day 13 of admission, he reported chest pain and shortness of breath. EKG revealed sinus tachycardia (fig 2); labs were significant for leukocytosis of 16.9, troponin 389, CRP 436.03, Cr 1.77, and urine glucose >1000 (fig 3). The patient's temperature was 100.6 F and HR 116 BPM. He was transferred to the MICU for management of sepsis, bilateral aspiration pneumonia, and new-onset Afib with RVR. In addition to the CL team, the cardiology and infectious disease teams became involved.

CASE CONTINUED

The cardiology team determined that he likely developed myopericarditis and type 2 NSTEMI⁵. Colchicine and a 7-day course of cefepime and vancomycin were started, with all medications renally dosed. He was also coxsackie ab + though the ID team recommended no action due to low concern for active infection. After 6 days in the MICU the patient was downgraded to the telemetry floor, where lurasidone was started and titrated to 40mg daily. Despite partial response, he remained suicidal, and ECT was recommended.

The CL team coordinated between the ECT, cardiology, internal medicine, and inpatient psychiatry teams. 19 days after being transferred from the MICU, treatment began, with the internal medicine team providing preoperative medical assessment prior to each treatment. The patient remained under the care of the internal medicine team until the treatment was underway, after which time he was transferred to inpatient psychiatry with medicine consulting. The patient underwent 11 bitemporal treatments without any significant complications (table 1). Once treatment concluded, the patient was able to safely return home by bus.

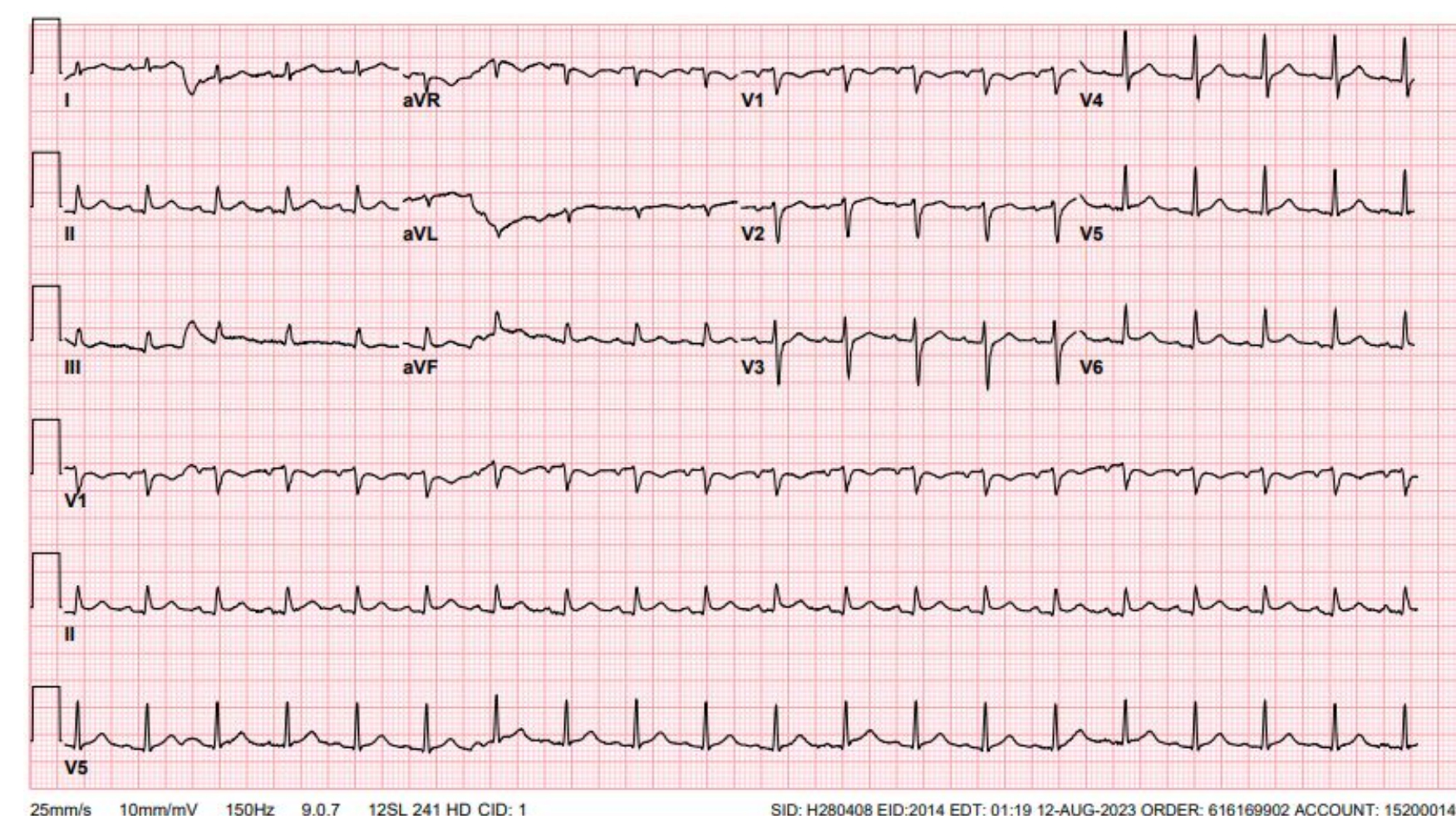


Figure 2: EKG from hospital day 13

- | | |
|--------------|----------------|
| Mirtazapine | Acamprostate |
| Naltrexone | Aripiprazole |
| Paliperidone | Bupirone |
| Quetiapine | Cariprizine |
| Risperidone | Desvenlafaxine |
| Sertraline | Hydroxyzine |
| Vilazodone | Lithium* |

Figure 1: previous medication trials.*lithium was the most effective, was discontinued due to renal injury

- Bradycardia and asystole are most common in RUL²
- Bradycardia/asystole usually self-resolve, but risk can be mitigated by holding beta-blockers and pretreating with an anticholinergic agent²
- HR and BP spikes can be minimized with esmolol¹
- Thoughtful choice of anesthetics/muscle relaxants helps predict anticipated cardiovascular effects¹.
- Continuous EKG monitoring throughout the procedure¹
- Having a defibrillator ready¹.

Figure 3: examples of means of cardiac optimization

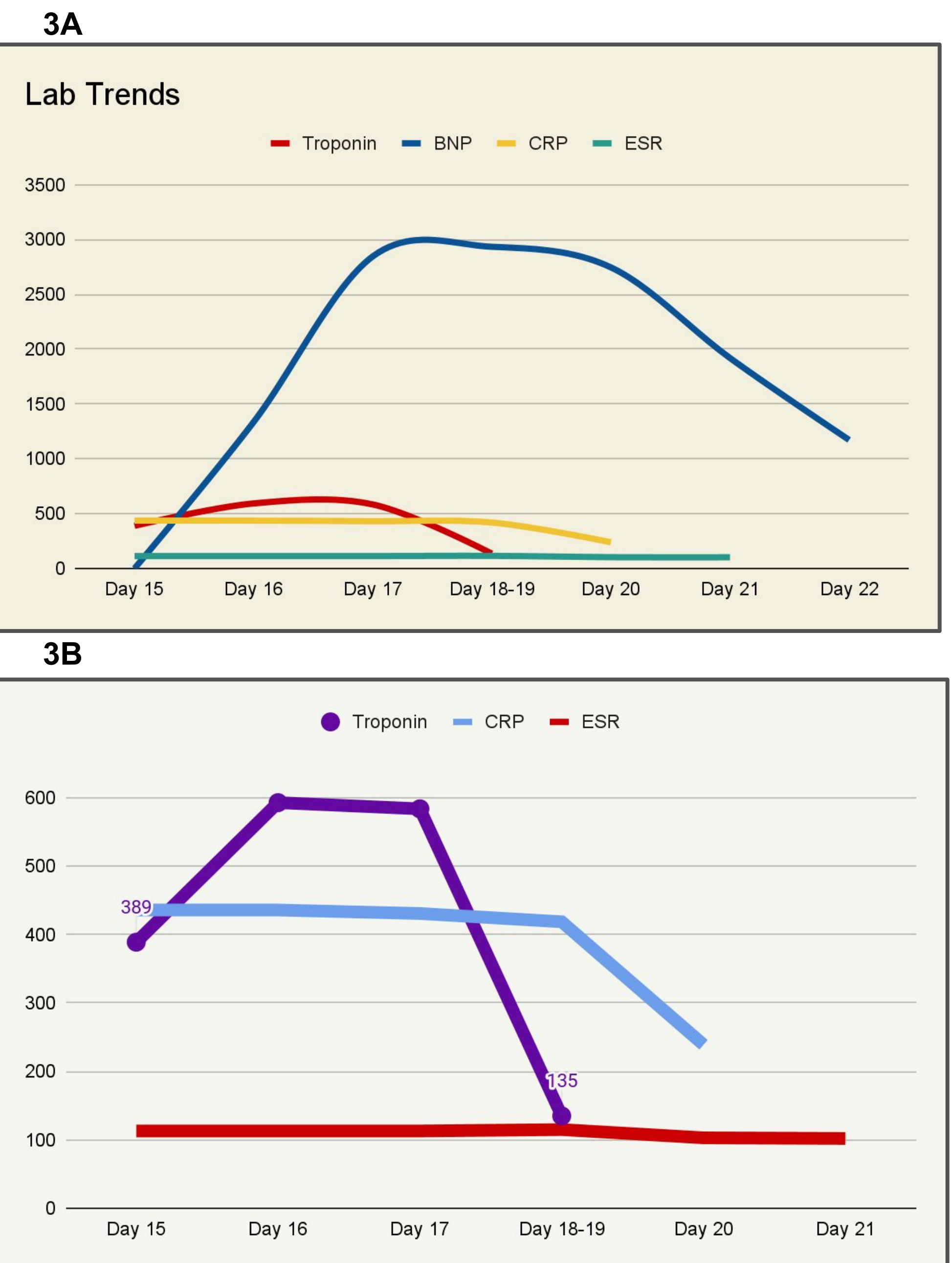


Figure 3A (top): lab trends throughout hospital stay. 3B (bottom): detail of troponin, CRP, ESR trends

DISCUSSION/CONCLUSION

ECT is a physically taxing procedure, with a dearth of guidance on its use in the setting of recent ICU-level care and cardiac injury such as in this patient. Inter-team collaboration, medical optimization, and utilization of available evidence are critical, and patient-specific choices are necessary.

General recommendations regarding mitigating risk, anticipating complications, and readying the multidisciplinary team to resolve problems should be used to guide optimization (fig 3). This patient was able to tolerate a course of bitemporal ECT following NSTEMI and myopericarditis without complications, indicating that with appropriate monitoring, planning, and collaboration this procedure can be safely undertaken even in the setting of recent cardiac injury.

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Disclosures: none of the authors have any disclosures to report