

# POST SPINAL ANESTHESIA CARDIAC ARREST: IS IT ALWAYS AN ANESTHETIC COMPLICATION? A CASE REPORT

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**Abstract:** Sudden, on-table cardiac arrest following spinal anaesthesia is rare but catastrophic with incidence of 6.4 per 10000 spinal anaesthetics<sup>1</sup>. There are numerous possible causes in literature. We describe a case of cardiac arrest on operation theatre table after spinal anaesthesia. It was not less than a challenge to diagnose pulmonary thromboembolism in such setting where usually we think of high spinal or total spinal anaesthesia as the cause. This case report is being presented to bring forth the importance of vigilant monitoring and prompt intervention in management of sudden cardiac arrest after spinal anaesthesia.

**Keywords:** Spinal Anesthesia, Cardiac Arrest, Pulmonary Thromboembolism.

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## 1. INTRODUCTION

Sudden, on-table cardiac arrest following spinal anaesthesia is rare but catastrophic with incidence of 6.4 per 10000 spinal anaesthetics<sup>1</sup>. There are numerous possible causes in literature. We describe a case of cardiac arrest on operation theatre table after spinal anaesthesia. It was not less than a challenge to diagnose pulmonary thromboembolism in such setting where usually we think of high spinal or total spinal anaesthesia as the cause. This case report is being presented to bring forth the importance of vigilant monitoring and prompt intervention in management of sudden cardiac arrest after spinal anaesthesia.

## 2. CASE REPORT

A 54 years male, asthmatic, ASA grade 2 patient with fracture neck femur, was on bed for 2 days before he was posted for ORIF. He had no significant past medical or surgical history. General and systemic examination revealed no abnormality. His airway examination was normal. Routine blood investigations were within normal range. ECG and chest X-ray showed no significant abnormality. He was classified as ASA grade 2 and planned for regional anaesthesia. patient was explained about the plan and consent for taken.

Pre operative vitals were as follows

HR: 88/min BP : 130/80 mmHg Respiratory Rate : 14/min SPO2 99% on RA

Spinal anaesthesia was given at L3 –L4 interspace in sitting position with 3 ml of 0.5% Inj. Bupivacaine Heavy +25 mcg Inj. Fentanyl. After spinal anaesthesia ,sensory block till T8 achieved at 9 minutes. Vitals then were : HR 76/min, BP 110/70mmHg, SPO2 99% on RA. 5 minutes after patient positioning to lateral, he developed hypotension, BP- 80/50mmHg, didn't respond to Inj Mephentermine 6 mg IV and IV fluid boluses of 0.9% Normal saline, HR shot up to 130/min with Pulse thready. Patient was restless, SpO2 80%.supplemental O2 with face mask @6 lit/min was administered. In about 2 min, Patient became unresponsive, no pulse<sup>2</sup>. Protocolized CPR started, intubated, connected to ventilator and EtCO2 monitoring. ROSC<sup>3</sup> (Return of spontaneous circulation) achieved after 2 cycles of CPR, AF with Fast Ventricular Rate. EtCO2: <20mmHg. ABG showed respiratory acidosis. Within 15 minutes patient had PEA cardiac arrest, started CPR again. ABG showed respiratory acidosis. After ROSC, Arterial cannulation was done ,BP recorded 80/40 mmHg. Inj Adrenalin infusion @0.1 mcg/Kg/min started.

Causes of cardiac arrest<sup>6</sup>, the 5H and 5T were thought of and suspicion narrowed down to thrombosis (last two Ts)

### 5H

Hypovolemia

Hypoxia

Hydrogen ion(Acidosis)

Hypo/hyper kalemia

Hypothermia

### 5T

Toxins

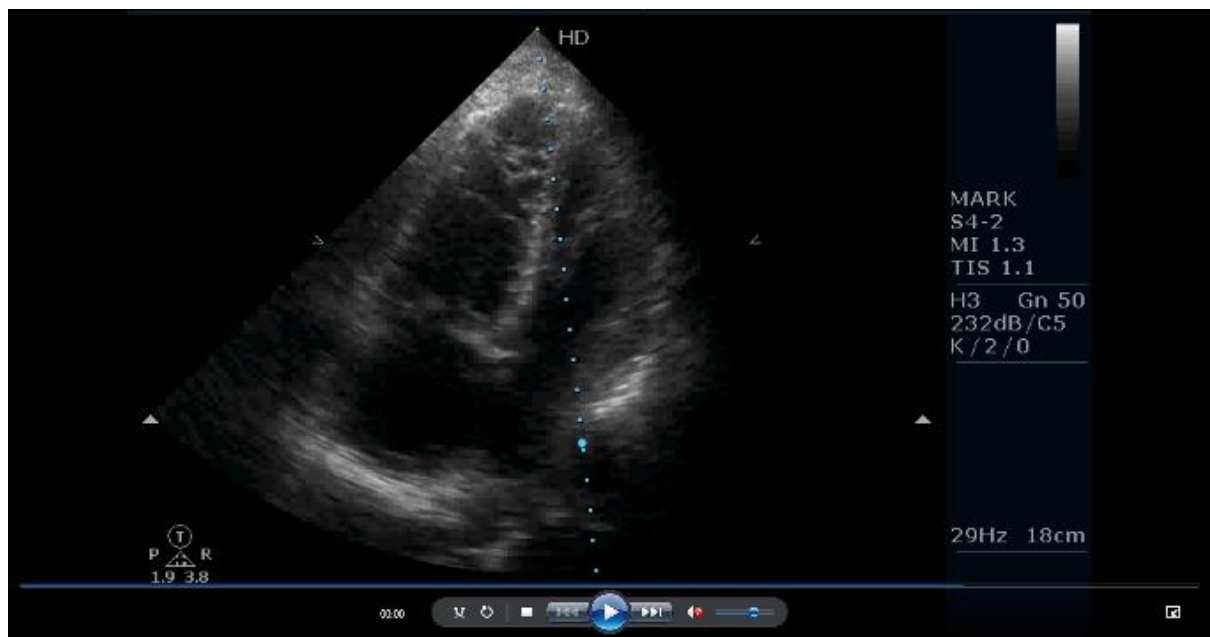
Tamponade Cardiac

Tension pneumothorax

Thrombus coronary

Thrombus pulmonary

2D Echocardiogram by anaesthesiologist in Operating Room showed grossly dilated Right Atrium, Right Ventricle; paradoxical interventricular septum movement, distended Inferior Vena Cava.



Diagnosis of Acute Pulmonary Thrombo Embolism was made, planned for thrombolysis. Surgery was abandoned. Patient was shifted to surgical ICU on ventilator support. vital parameters were as follows:

BP 100/60 mmHg , HR 130/min ,SPO2 88% with 60 %o2

After consulting cardiologist, Inj. Tenectaplaste 30mgIV given followed by Inj Heparin 1000 IU/hr. infusion. Patient improved hemodynamically in 3 hrs. ,we could start weaning off inotropic support.

Review 2D Echocardiogram after 4 hours: Normal RA, RV; IVC compressing >50%. Patient was electively ventilated overnight, extubated next day. Reports of blood sample sent at the time of intraoperative event showed as follows: D-Dimer 1:4 dilution( positive), urine for fat globulins Negative, Troponin T was also negative <0.1 ng/ml .

The next day, patient was weaned off the ventilator and extubated , Arterial Blood Gas analysis was normal, chest x-ray was normal. Heparin infusion was stopped and Inj low molecular weight Heparin 60 mg subcutaneous twice daily dose was started. Inotropes were completely weaned off over the day. Although chest x-ray was normal, CT Pulmonary

angiogram on third day showed pulmonary embolism with filling defects in posterolateral segmental and sub segmental arterial branches of lower lobe of right lung and lingular segmental artery of left lung. Minimally dilated pulmonary arteries.



He was continued on Inj Low Molecular Heparin for two weeks.

He underwent surgery two weeks later under planned general anaesthesia, uneventful, he recovered well Inj enoxaparin was changed to tab warfarin 2mg Once Daily for a week after the surgery. Patient was discharged in stable condition.

### 3. DISCUSSION

Spinal anaesthesia is considered as a safe procedure which rarely gets complicated. The first cases of cardiac arrest, as an inexplicable complication of spinal block anaesthesia, were reported in the decade of 1940, when the interest in the subject arose since it involved, in most cases, young and healthy patients<sup>5</sup>.

Ever since caplan et al reported 14 cases of unexpected cardiac arrests under spinal anaesthesia, American society of anaesthesiologists closed the claim analysis, numerous reports and reviews have been studied and published. the etiology of cardiac arrest under spinal anaesthesia remain controversial and unclear. Over sedation, respiratory arrest, unintentional total spinal, myocardial infarction, and local anaesthetic toxicity have all been suggested as the causative factors.

Cardiac arrest<sup>4</sup> has been reported within 12–72 min of spinal anaesthesia, while other cardiovascular side effects have been reported as late as 3–5 h after the administration of spinal anaesthesia.

Besides all these, rare, spinal unrelated causes like pulmonary embolism, as in our case can oppose a challenge in setting where common causes are thought of. Our patient was hemodynamically stable and well oxygenated prior to the administration of spinal anaesthesia. No ischemic changes were noticed in the electrocardiogram. Causative factors like myocardial infarction, respiratory depression, local anaesthetic toxicity, subdural injection, and high level of spinal anaesthesia were considered and excluded by the sequence of events and laboratory investigations. Risk of long bone fracture was considered and fat embolism was ruled out. Schematic and protocolized approach to ACLS is crucial in such settings. We could immediately initiate CPR and simultaneously think of various 5H and 5Ts as discussed above which reduced the perplexity and skepticism. We could effectively solve the puzzle and reduce mortality.

We must reiterate that the significance and management of such clinical situations depends upon the anaesthesiologist's acumen and a high index of suspicion in order to detect early that something is "going wrong". The experience-based empirical anaesthesia practice should always consider the evidence-based approach in such clinical situations

#### 4. CONCLUSION

Team work , team training in ACLS as well as Rapid evaluation of causes of cardiac arrest (5Hs and 5Ts) is of utmost importance in decision making and effective management Diagnosis of PTE could have been missed easily resulting in patient mortality. The knowledge of the physiologic changes caused by spinal anaesthesia with background knowledge of other possibilities ,adequate patient selection, respecting the contraindications of the procedure, adequate monitoring, and constant vigilance are of paramount importance to the eventual outcome.

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