

Accidental Intravascular Adrenaline Rush Following Local Infiltration in Vaginal Hysterectomy in a Wide Awake Patient (A Rare Case Report)

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Abstract: Blood loss during surgery, particularly in vaginal hysterectomy, is a significant concern for both surgeons and anesthesiologists. Various techniques, including the use of local infiltration with adrenaline, are commonly employed to reduce blood loss and improve hemostasis. While the benefits of adrenaline infiltration are well-established, its potential to cause serious cardiovascular complications, such as tachyarrhythmias and acute hypertension, cannot be overlooked. This case report describes an accidental intravascular injection of adrenaline during vaginal hysterectomy in a 47-year-old patient, leading to a severe cardiovascular crisis. The patient experienced a sudden onset of tachycardia, hypertension, chest pain, headache, and pulmonary edema following submucosal adrenaline infiltration. The situation was promptly managed with a combination of antiarrhythmics (lignocaine, esmolol, and amiodarone), diuretics (furosemide), and 100% oxygen, resulting in stabilization of the patient's condition. After a period of intensive monitoring in the ICU, the patient made a full recovery, with normal sinus rhythm and no long-term sequelae. This case highlights the importance of recognizing the potential risks associated with local infiltration of adrenaline and the necessity of careful monitoring during its administration. It is essential to have appropriate medications and interventions readily available in such scenarios, and to ensure timely detection and management of complications to ensure patient safety.

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I. INTRODUCTION

Blood loss during surgery is a matter of great concern both for the surgeon and anaesthesiologist. Till date multiple techniques have been reported to achieve better hemostasis and surgical dissection, such as topical application of adrenaline soaks, subcutaneous administration of vasoconstrictors like Adrenaline and Terlipressin.¹ In vaginal hysterectomy, the most preferred method of reducing blood loss is local infiltration of adrenaline containing solution.¹ This infiltration of adrenaline may cause tachyarrhythmias which mostly resolve on their own without any intervention but, sometimes even a small dose of adrenaline going intravascular can precipitate unexpected and dramatic cardiovascular crisis with severe hypertension, tachycardia, pulmonary oedema and life threatening arrhythmias.^{2,4} Immediate recognition of these symptoms and judicious management of accidental intravascular injection of adrenaline can aid in achieving good outcomes without any long term sequelae.

II. CASE REPORT

Here, we present a case of a 47-year-old ASA-1 physically well appearing woman who presented to the gynecology department of our hospital with complaints of dragging sensation in perineum, low backache and irregular heavy bleeding per vaginum for 1 year. On detailed evaluation, the patient was diagnosed with 3rd degree vulvovaginal prolapse with cystocele and fibroid uterus. Vaginal hysterectomy with anterior colporrhaphy and posterior colpoperineorrhaphy was planned. There was no preexisting chronic illness and no previous allergies were known. She was not on any medication. ECG and Blood workup were normal with BP 124/78 mm of Hg, HR 75 beats per min regular, RR = 15/min, Spo2 =98% on room air and Temp 37.5 degree Celsius.

Patient was kept nil per orally for 6 hours prior to surgery. Tab. Anxit 0.5mg and Injection ranitidine 50 mg iv were given one night prior to surgery. On the day of surgery,

in the operating room, all the necessary monitors (NIBP, SPO2, ECG) were attached to the patient and i/v infusion of ringer lactate was started. Spinal anesthesia was then given with injection bupivacaine 0.5% heavy 3.0 ml with injection fentanyl 25µg at L3-L4 spinal level with 27G spinal needle. After spinal anaesthesia vitals of the patient were BP 122/78 mm Hg, PR 78 beats per min, SPO2 98% on room air. Surgery was allowed to proceed.

After cleaning, painting and draping, the surgeon injected 40 ml of Adrenaline (1:200000) dilution (normal saline) in the submucosal layer of the cystocele after negative aspiration. After 2-3 minutes of adrenaline infiltration, the patient started complaining of a throbbing headache and chest pain. Till now perioperative fluid given to patient as ringer lactate was 500 ml. ECG showed arrhythmias with VPC's (10-12/min) and pulse was irregularly irregular. HR increased upto 150 bpm. Sudden spike in BP was recorded as 190/110 mm Hg. Oxygen saturation dropped to 85-90% on room air with RR = 20/min. There were no signs of airway obstruction but coarse crepitations were found on auscultation. Surgery was stopped. Pt was administered 100% oxygen with a high flow mask. A provisional diagnosis of Atrial fibrillation with fast ventricular rate with VPCs with acute hypertension with acute congestive heart failure leading to acute pulmonary oedema due to intravascular adrenaline injection/ Absorption was made. Injection lignocaine 60 mg and esmolol 30 mg, injection furosemide 20 mg IV were given. After 10 min, BP decreases to 160/90 mm of Hg and HR decreases to 120bpm and VPCs decrease to 5-7 /min but Atrial fibrillation persists. Again Injection lignocaine 60mg and injection amiodarone 150 mg (loading dose over 20 min) were given. After 20 min of repeat dose throbbing headache and chest pain were resolved and BP decreased to 140/84 mm of Hg and HR decreased to 100 bpm. Surgery was abandoned. Over a period of 1 hour crepitations improved, BP decreased to 136/80 mm Hg, HR remained 90-100 bpm with Atrial fibrillation persisted with no VPCs and urine output was 120ml.

Patient was shifted to the Intensive care unit and an infusion of amiodarone was started. After 6 hours ECG showed normal sinus rhythm on the monitor. 12 lead ECG, 2D ECHO, Chest X-ray and serum electrolytes were normal. She was shifted out of ICU after 24 hours and discharged on the 3rd day. Follow-up ECG after 1 week showed normal HR and sinus rhythm.

III. DISCUSSION

Skin and subcutaneous tissue infiltration with adrenaline prior to incision is a common practice in an attempt to decrease the vascularity of the tissues which improves the surgical field view and reduces the blood loss while operating.² To achieve better homeostasis in vaginal hysterectomy various vasoconstrictors used are adrenaline and terlipressin . Most commonly used vasoconstrictor is adrenaline. Its half life is 1.7 min.³ Safe dose of adrenaline is 5-10 mcg /kg for infiltration.² Benefit of adding lignocaine to adrenaline is to prevent tachyarrhythmias. Different doses of adrenaline used in vaginal hysterectomy for decreasing blood loss are 1:100000, 1:200000 and 1:500000 dilutions. S/C

infiltration with 1:100000 dilution causes significant tachycardia than 1:200000 and 1:500000 dilution. 1:500000 dilution is Virtually free of any side effects with the significant decrease in blood loss.²

In our case 40 ml of 1:200000 dilution i.e 200 mcg adrenaline was used for Sub mucosal infiltration prior to incision to decrease the blood loss. After 2-3 min patients having symptoms of tachyarrhythmias, chest pain, headache, acute hypertension, acute congestive heart failure leading to pulmonary oedema. Treatment to our patient given with Injection lignocaine, injection esmolol and injection amiodarone and 100% oxygen. After 30 min of treatment many of the symptoms of our patient settled down and the patient shifted to ICU for further management of Atrial fibrillation and Observation.

Despite every precaution and dose of adrenaline being less than safe dose adrenaline can still go into the vascular compartment and can affect hemodynamics adversely. So an adequate time interval should be there between infiltration and surgical incision to rule out intravascular injection / absorption of the drug.

IV. CONCLUSION

In our case after subcutaneous infiltration of adrenaline in 1:200000 dilution patients having symptoms of tachyarrhythmias, chest pain , headache, acute hypertension, acute congestive heart failure leading to pulmonary oedema.

In the present case, it was an elective surgery and the surgical procedure was yet to start, it was possible to abandon the procedure. Continuation of surgery or in cases where it was impossible to postpone procedure due to emergent nature, risk to patient increases manifolds.

We suggest that these injectable drugs Frusemide, Lignocaine i/v, Esmolol, Labetalol, Mephentramine, Amiodarone, Nor-adrenaline, Adrenaline should be readily available in cases where adrenaline infiltration is used. During procedure as per minimum criteria of ISA patient's NIBP, ECG, SPO2 should be monitored.

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