

## Asymptomatic presentation of atrial fibrillation in a patient scheduled for emergency exploratory laparotomy

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### Abstract

The diagnosis of Atrial Fibrillation (AF) constitutes a significant consideration to the Anaesthetist. We report a 56-year old man with asymptomatic AF, undergoing emergency laparotomy on account of bowel obstruction from colonic mass. An incidental suspicion of AF was made with radial artery palpation and subsequently confirmed with an urgent 12-lead electrocardiogram (ECG). He had a multidisciplinary review, and was placed on metoprolol 25mg. He had the surgery under general anaesthesia. About five minutes into the procedure, there were signs of supraventricular tachyarrhythmia (SVT), possibly AF with cardiovascular (CVS) perturbations, i.e., pulse rate (PR) of 190bpm and blood pressure (BP) of 64/38mmHg. Rate control was achieved with intravenous labetalol 5mg every 60 seconds in aliquot, till total of 55mg, and RR < 120bpm, BP - 110/60mmHg and sinus rhythm restoration. The AF triggers, i.e., light anaesthesia, pain, vagal stimuli, and volume imbalance were corrected. Subsequent intra- and postoperative care were uneventful. He was placed on daily tab metoprolol 25mg, and aspirin 75mg, discharged home and seen in clinic.

## Présentation asymptomatique de fibrillation auriculaire chez un patient prévu pour une laparotomie exploratoire d'urgence

### Résumé

Le diagnostic de fibrillation auriculaire (FA) constitue une considération importante pour l'anesthésiste. Nous rapportons le cas d'un homme de 56 ans atteint de FA asymptomatique, soumis à une laparotomie d'urgence en raison d'une occlusion intestinale due à une masse colique. Une suspicion fortuite de FA a été faite par palpation de l'artère radiale et ultérieurement confirmée par un électrocardiogramme (ECG) à 12 dérivation en urgence. Il a eu un examen multidisciplinaire et a été placé sous métoprolol 25 mg. Il a été opéré sous anesthésie générale. Environ cinq minutes après le début de l'intervention, il y avait des signes de tachyarythmie supraventriculaire (TSV), peut-être une FA avec perturbations cardiovasculaires (CVS), c'est-à-dire une Fréquence Cardiaque (FP) de 190 bpm et une pression artérielle (PA) de 64/38 mmHg. Le contrôle de la fréquence a été obtenu par administration intraveineuse de labétalol 5 mg toutes les 60 secondes en aliquote, jusqu'à un total de 55 mg, et une RR < 120 bpm, une PA - 110/60 mmHg et une restauration du rythme sinusal. Les déclencheurs de FA, c'est-à-dire une anesthésie légère, la douleur, les stimuli vagues et le déséquilibre volumique ont été corrigés. Les soins peropératoires et postopératoires ultérieurs se sont déroulés sans incident. Il a été placé sous métoprolol 25 mg par jour et aspirine 75 mg, a été renvoyé chez lui et a été vu en clinique.

**Mots-clés:** Fibrillation auriculaire, anesthésie, labétalol, diagnostic préopératoire, contrôle de la fréquence, patient cardiaque, chirurgie non cardiaque

## **INTRODUCTION**

Atrial fibrillation (AF) is probably the most encountered perioperative heart rhythm abnormality (1,2). While its incidence is worldwide, (3) hospital and community-based studies showed low african prevalence of 5% and 0.43%, respectively (4,5).

With an aging population, anaesthesia providers will likely meet these patients. Predisposing factors could be patient-, surgical-, or anaesthesia-related (1,2,6). Age > 70years, male sex, smoking, alcohol, obesity, sedentary lifestyle, autonomic stimuli, recreational drugs, anxiety, and sleep apnea are associated factors (2,5,7). Others are obesity; diabetes mellitus (DM), thyroid disorders; sepsis; asthma; hypertension and congestive cardiac failure (CCF) (5,6,8). Light anaesthesia, pain, gas exchange failure, anaemia, volume loss, sodium, and potassium disorders are AF triggers (2,3,7).

The AF diagnosis is a significant finding (2). Often benign, alternatively, it could be fatal from stroke, CCF, or myocardial infarction (MI) (2,3,7). It could manifest differently; sudden or gradual, asymptomatic or conspicuous (1,2,9). If detected preoperatively, sinus rhythm should be restored, to promote a favourable outcome (10,11). Anaesthesia considerations includes the degree of optimisation, co-morbidities, triggers, surgical extent, and anaesthesia technique. Complications should be anticipated (2,7). We report the anaesthesia care of an accidental asymptomatic AF patient undergoing a non-elective laparotomy in our hospital.

## **CASE DESCRIPTION**

Pre-anaesthesia: Mr. O.B, a 56-year-old male, presented to the Emergency unit of our facility in January 2024, with a five-month history of worsening change in bowel habit, passage of pellet-like stool, and weight loss. The acute symptoms were repeated vomiting, nausea, abdominal pain, and peritonism. There was no cough, chest pain, palpitations, or dyspnea. Other review was insignificant. He was not a known hypertensive or DM patient.

On examination, he was conscious, lethargic, and in painful distress. Cardiac examination showed PR of 85 bpm, and BP of 150/90 mmHg. There was no raised jugular venous pulse (JVP). The first and second heart sounds were heard only, with no added sounds. An irregularly irregular pulsation with digital palpation was the significant finding. No other abnormality was found. The abdomen showed no ascites, but a palpable left iliac fossa mass. Digital rectal examination revealed empty

rectum. Other findings were not contributory. Assessment of bowel obstruction, from a differential of intussusception, diverticulosis, or a colonic mass was made. Acute peritonism, from perforated viscus was considered.

The pre-anaesthesia review confirmed the above findings. The 12-lead ECG showed AF features; i.e., irregularly irregular rhythm, absence of a formed p-wave and isoelectric line, variably expressed ventricular rate and a narrow QRS complex. Echocardiography which could not be done, due to shortage of staff and opening hours, could detect thrombus formation, predisposing to thrombo-embolic event. The echocardiography could also assess the chamber size, valves, wall-motion and ejection fraction. Since, the patient had no previous ECG to establish the baseline rhythm, an assessment of a new-onset or pre-existing AF could not be made. Thus, he was considered newly-diagnosed AF. The cardiologist prescribed metoprolol 25mg for rate control, which was administered via a nasogastric tube. Parenteral metoprolol is preferable, has faster onset with full stomach, but inaccessible.

Preoperative blood profile was optimal. The haemogram was 13gm/dL. The patient was assigned the American Society of Anesthesiologists (ASA) status III E. He was planned for general anaesthesia with tracheal intubation, educated on perioperative CVS event, and counselled for postoperative intensive care unit (ICU) admission. Informed consent was obtained.

Anaesthesia care: The surgical safety checklist was done. All required drugs were drawn and labeled. He was planned as a cardiac disease patient undergoing a non-cardiac procedure. Monitoring included 5-channel ECG, non-invasive blood pressure (NIBP), capnography, and pulse oximetry. Labetalol, epinephrine, and defibrillator were made available.

Baseline vitals were PR - 68 bpm, BP - 156/78 mmHg, and 95% saturation in room air. Pre-surgery ECG showed varying R-R intervals, and fibrillary waves with no distinct p-waves. He had 1% lidocaine 10ml as anti-arrhythmic, glycopyrrolate 0.2mg as anti-cholinergic premedication, and 100% oxygen pre-oxygenation. Sleeping doses of midazolam 4mg, fentanyl 100µg, and Sevoflurane 3 - 6% MAC in 100% Oxygen co-induction were given, to produce minimal effect on rate and rhythm. Succinylcholine 100mg was used to facilitate intubation using tracheal tube (TT) cuffed size 8.0 mm ID. Tube placement confirmed with

auscultation and capnography, was connected to the Anaesthetic machine, using a circle-breathing system. Sevoflurane at MAC 2 – 4 % adjusted to effect and vecuronium 2 mg every 30 minutes, were used for maintenance.

About five minutes into the surgery, the ECG tracing showed a sudden onset of supraventricular tachy-arrhythmia, possibly an AF. There was associated tachycardia, PR > 190 bpm and hypotension, BP < 68/36 mmHg. Light anaesthesia, pain, or vagal activation from bowel traction were identified as possible triggers. The surgeons stopped the surgery. Rate control was achieved with repeated IV labetalol 5mg every 60 seconds, till total of 55mg. Vitals improved to PR – 120bpm, and BP - 110/60 mmHg over 10 minutes approximately. Thus, cardioversion for rhythm control was not needed.

Next, the AF triggers were corrected. Depth was increased with propofol 10 - 50mg in boluses, and titrated Sevoflurane MAC 2 – 6%. Analgesia was provided with fentanyl 50µg, paracetamol 1gm, diclofenac 75mg, and morphine 4mg. Normoxia, normocapnia, normal BP and euvoalaemia were ensured.

The surgery lasted three hours and was uneventful. The intraoperative findings were a resectable sigmoid colon tumour. A sigmoidectomy and a divided colostomy were performed. The blood loss was 50mls, with aid of Ligature. The patient had Ringer's lactate 2000ml.

After the surgery, he was reversed with atropine 1.2 mg and neostigmine 2.5 mg. He was extubated deep, and had oxygen supplementation.

Post-anaesthesia: He was monitored in the recovery room, and discharged to the male ward with good Aldrete score. The vitals were PR - 80bpm, BP - 130/80mHg and SPO2 – 99%. He had daily metoprolol 25mg, and Clexane 40mg, later changed to aspirin 75mg. Colostomy training was done. He was discharged home on postoperative day nine. He was seen at the outpatient clinic for two months.

## **DISCUSSION**

We report an asymptomatic preoperative AF patient undergoing emergency laparotomy on account of bowel obstruction from colorectal mass.

The perioperative AF is uncommon. A meta-analysis reported 3.7% incidence. The undetected or un-anticipated AF could lead to CVS collapse, MI, stroke and death (11,12).

The AF is classified as new-onset, pre-

existing, or paroxysmal (11). The pathology consists of a disorganised electrical impulse from sites outside the sino-atrial (SA) node, channeled via the atrioventricular (AV) node. Dyssynchronous heart rate, stroke volume, and diastole, reduces cardiac filling, cardiac output and myocardial blood flow (2,6).

In all cases, preoperative optimisation should be prioritised (10,11,12). The ACC/AHA/ACCP/HRS guideline recommend a full preoperative cardiac workup (1,6). In this patient, the history of palpitation, chest pain, effort intolerance, dyspnea, and syncope were absent. Signs of irregular pulses with rate variety, loud or absent first heart sound, and features of hypertension, CCF, and MI were not found (1,6,7).

As seen in our patient, the AF's presentation could be asymptomatic, sub-clinical and confusing (1,13). Thus, the Anaesthetist, working in limited-resource setting should maximise clinical judgment. Digital palpation, accessing peripheral pulses, BP, JVP, heart and lung sounds are useful, but complimented with other investigations.

Full cardiac work-up is desirable. This includes a plain chest radiograph, 12-lead ECG, echocardiography, and a 24-hour cardiac monitoring (6,7,13). The ECG may show fibrillary waves with changing shape and size, and variable QRS complex. Bundle branch block, and pathologic Q-waves may show an underlying cardiac disease. Blood test should exclude haemoglobin, glucose, and electrolytes perturbations. Thyroid, renal and lung function tests are advised (1,7,13).

There are limited investigation options in our setting. However, chest Xray, ECG, blood glucose, urinalysis and blood profile were done in our patient.

Cardiac risk assessment includes the Goldman Cardiac Risk Index, the ACS NSAIP risk calculator, the ACC/AHA and ESC guidelines, and the Canadian Cardiovascular Society guidelines, among others (13,14). The Goldman Cardiac Risk Index is widely used. The total score is 53 points. The positive findings in our patient were a rhythm apart from sinus (7 points), abdominal (3 points) and emergency procedure (4 points), i.e., 14 points, indicating high mortality risk (13,14).

Preoperative challenges e.g., anaemia, hypovolaemia, pain, hypoxia, hypercapnia, and dysrhythmias were optimised (11,12). A multidisciplinary approach to care was employed (9,11).

It was unknown, if our patient had a new-onset or

a pre-existing arrhythmia. However, it was considered newly-diagnosed. Thus, perioperative tachy-arrhythmia was anticipated.

To conduct general anaesthesia, the American Society of Anesthesiologists (ASA) recommend that smooth induction will ensure unchanging heart rhythm (2). Most anaesthetic agents are useful, but given slowly, since their hypotensive effects could worsen patient's status. Titrated fentanyl, midazolam, and sevoflurane co-induction was used in our patient (2,10). Agents with SNS actions such as ketamine, and pancuronium is cautiously used (12).

The perioperative AF management guideline recommends a triad of (1) rapid rate and or rhythm restoration, (2) removal of precipitating stimuli, and (3) anticoagulation (6,11,13), which was done in our patient.

First, rate control was attempted with IV labetalol 5mg in repeated aliquot. We noticed a sustained improvement, and thus, cardioversion for rhythm control was not needed. The rate control is a non-inferior strategy to rhythm control. However, the rhythm control is preferred in CCF, MI, or DM patients (11,12). Rate control can be achieved with metoprolol, verapamil, or diltiazem, which were inaccessible in our facility (11). Labetalol, an alpha and beta-blocker was used (12,13). Digoxin is used in refractory AF. However, individualised-approach to care is recommended. The rhythm-control may be achieved with magnesium, amiodarone, or adenosine (11,12). However, the synchronised direct-current cardioversion (DCCV) is recommended and should be attempted early. The addition of flecainide, D-sotalol, and quinidine can increase the DCCV success rate in resistant AF (13,15).

Secondly, we removed all AF triggers. Bowel traction in laparotomies, eye, ear, cervical and anal instrumentation are known surgical triggers (11,12). Poor anaesthesia depth, pain, hypoxia, volume loss, massive blood transfusion, and hypothermia are other triggers (13,15). While, the surgeons temporarily stopped the surgery, anaesthesia depth, normoxia, normocapnia, adequate analgesia, and euvolemia were optimised (2,13,15).

The third protocol is anticoagulation. A newly-diagnosed AF is unlikely to be well-anticoagulated before surgery. Embolism may be predisposed by cyesis, CCF, contraceptive pills, aneurysms, fracture and immobilisation (6,11). The CHA2DS2-VASc score is used to stratify patients (13). High-risk individuals will require preoperative heparinisation. Enoxaparin,

dabigatran, warfarin and factor Xa blockers are useful. Bleeding and thrombotic risks should be balanced (11,12).

Anaesthesia emergence should be detailed. Deep extubation is beneficial, followed by oxygen supplementation. Ward or ICU admission should be individualised and monitoring should be done till full recovery (11,12).

We advise that a senior Anaesthetist should lead. All resources, including the defibrillator, is harnessed. Arrhythmia should be anticipated. An ICU bed should be booked.

## CONCLUSION

It is possible to perform surgery on an AF patient presenting in an emergency, with good results in a resource-limited environment. A multi-disciplinary collaboration should formulate a surgical plan after a thorough review of the comorbid condition.

**Recommendation:** The preoperative identification of AF in a surgical patient may be life-saving. While routine digital palpation may detect missed beats, other causes should be explored. Full cardiac work-up is preferred and Anaesthetists are encouraged to ask for further investigation.

**Conflict of Interest:** The Authors declare no conflict of interest.

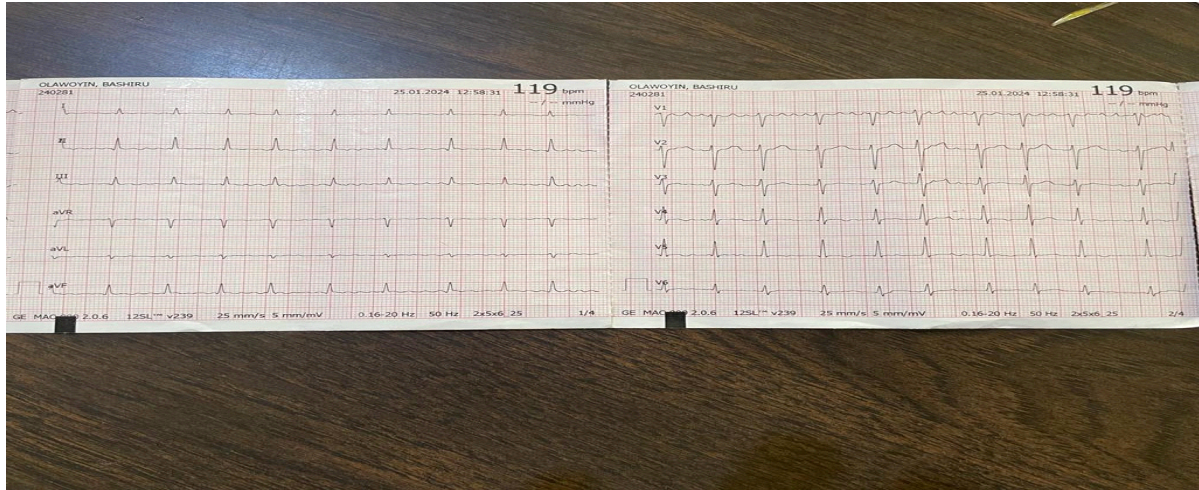
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**Author's contribution:** Matthias Osigbeme Ikokoh, Timilehin Mercy Jegede and Oluwaseun Tope Akinwumi conducted the anaesthesia, and co-wrote the manuscript. Abayomi Kolawole Ojo developed the concept and wrote the initial and final manuscript. Olusegun Isaac Alatishe conducted the surgery, and wrote the initial and final manuscript. Afolabi Muiyiwa Owojuyigbe and Jeremiah Abimbola co-wrote the manuscript.

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**Figure 1: A 12-lead ECG display showing Atrial fibrillation features in the patient**