

# Hypertensive Patient in the Surgical Ward – What the Surgeon Should Do

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## Summary

Two cases of hypertension are presented to emphasize the need for the surgeons to pay adequate attention to these purely medical conditions that may have a devastating adverse effect on the outcome of surgery. The article also highlights the serious constraints that still characterize the management of these patients in this part of the world. The ideal situation is a multi-disciplinary approach involving the Surgeon, the Physician and the Anaesthetist. The surgeon must not confine himself to the technical aspect of the surgery alone. The hypertension must be controlled whether the patient presents with an elective or emergent surgical condition and anti-hypertensive medication must be continued up till the time of surgery and at times intra-operatively. It is not only unnecessary but also potentially dangerous to withdraw anti-hypertensives before anaesthesia.

The main goal of the surgically amenable secondary hypertension is to remove the cause after adequate control of the hypertension in preparation for surgery. Patient however must be made to understand that the hypertension may not be "cured" and the anti-hypertensive medication may have to be continued post-operatively particularly if the hypertension is long established before patient presents. Local and/or regional blocks are to be preferred to general anaesthesia for peripheral lesions and even then it is still preferable to have the hypertension controlled.

**Keywords:** Hypertension, Surgery, Presentation, Management, Constraints, Control.

## Introduction

A significant number of surgical patients present with concurrent medical condition and as the life expectancy in Africans improves, the Surgeon in Africa will be confronted more and more with such patients both electively and as emergency. The purpose of this article is to highlight one of these conditions, namely hypertension that may impact negatively on the outcome of surgery. The Surgeon needs to have a good working knowledge of the management of this condition and not leave it all to the Physician, who may not always be available.

Two cases are presented to illustrate some of the problems and constraints associated with the management of this condition as they present in the surgical ward.

## Cases

1. O. I., hospital No 986159, a 23 year-old undergraduate was referred to the unit by the Physician with a one-year history of generalized headache, diaphoresis, a left lumbar intra-abdominal mass and hypertension that was rather difficult to control. Findings on examination included a blood pressure of 230/130mmHg and 7 x 10 cm left lumbar mass, which was confirmed by ultrasound and computed axial tomography to be infero-medial to the left kidney. Ultrasonography of the neck did not suggest a thyroid or parathyroid mass. A clinical diagnosis of secondary hypertension due to pheochromocytoma was made. The simplest confirmatory laboratory biochemical investigation (urinary VMA and/or metanephrine and normetanephrine) was unavailable to us. The blood pressure was brought down to 120/80mmHg with a triple therapy regime of

Atenolol, Nifedipine and Moduretic over a course of two weeks by the Physician. She eventually had exploratory laparotomy after being pre-loaded with intravenous fluid and rendered "autonomically neutral" with epidural before the administration of general anaesthesia. Two separate intravenous infusions of hydralazine and adrenaline respectively were set up. During mobilization of the retroperitoneal tumour, the blood pressure rose up to 245/145mmHg at one time only to crash to 65/45mmHg as soon as the tumour was removed. In the immediate post-operative period, she was observed to have a left facial paresis and left hemiplegia. She was hypotensive for 72 hours despite intravenous fluids and dopamine. The effort to source for more vasoconstricting sympathomimetics were unsuccessful. The blood pressure eventually normalized at 110/70mmHg. She improved considerably over several months post-operatively with physiotherapy and is presently ambulant without support though gait is not completely steady. She is not on any anti-hypertensive. The histopathology of the tumour was reported as extra adrenal pheochromocytoma (paraganglioma).

2. B. O. Hospital No. 990390, a 54 year-old Nigeria woman, an apparent victim of armed robbery attack, sustained gun shot injury to the left upper arm and abdomen. There was no past history of hypertension. On examination, the blood pressure was 130/80mmHg with a pulse rate of 100/minute. There were multiple pellet entry wounds in the left upper arm, left lumbar and peri-umbilical region. Abdominal paracentesis yielded free-flowing non-clotting blood. An emergency laparotomy confirmed haemoperitonium (1000mls) and a longitudinal rent in the greater omentum which was repaired. On the second post-operative day, she was

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noticed to have a left facial paresis and left hemiplegia and the blood pressure was discovered to be 170/90mmHg. A critical look at the record of the vital signs, pre-intra-and post-operatively confirmed that her blood pressure was normal until 48 hours after surgery. She was commenced on anti-hypertensives (Moduretic and nifedipine) and physiotherapy and made steady clinical improvement.

## Discussion

Hypertension is defined as sustained increase in blood pressure (BP) beyond 140/90mmHg in a patient not taking anti-hypertensive drugs (WHO Guidelines) (1). By current estimate, hypertension affects about ten million Nigerians (2). It is therefore a significant problem right now in the country though this figure is lower than in the industrialized western countries (3 & 4). Hypertension is a systemic disease causing peripheral arteriolar medial hypertrophy and thus increased peripheral vascular resistance. This leads to inability to regulate tissue perfusion correctly and results in tissue anoxia eventually. These changes often compromise cardiovascular reserve until it is insufficient to meet the stress of the peri-operative period. Wide fluctuation in blood pressure with cerebral, myocardial and renal ischaemia result (5). There is thus an increased operative morbidity and mortality if the blood pressure is not controlled. The massive outpouring of catecholamines in the peri-operative period, due to the fear and stress of anaesthesia and surgery will compound the problem and make surgery more hazardous.

Uncontrolled hypertension constituted a formidable risk to surgery in the past. Sprague (6) in 1929 found that 32% of his hypertensive patients died during or soon after surgery. Crompton, J.R. and colleagues (7) observed an equally depressing figure in their series between 1935 and 1947. At that time, without therapy, the life span of a hypertensive patient with mild and severe systemic organ compromise was reported as six and one year, respectively. When effective therapy for the control of hypertension became available, the dismal picture improved and guidelines for operation on hypertensives were established (5). These earlier works, and subsequent improvement of the fate of the hypertensive with medication, demonstrate the practical necessity to control hypertension before subjecting affected patient to further stress of surgery.

Majority of the patients present with essential hypertension, which constitutes about 95% of hypertension. A small minority like the first case have identifiable causes and this accounts for about 5% of hypertension. The surgically remediable subgroup constitutes even less (8 & 9). This first case was diagnosed clinically but could not be supported by the standard biochemistry (urinary VMA and/or metanephrine and nor-metanephrine) and  $I^{131}$  MIBG Scan. This case highlights the dilemma of objective laboratory diagnosis of secondary hypertension (phaeochromocytoma in this case) even in a tertiary hospital in this environment. A lot has to depend on the clinical acumen of the attending Physician.

The second patient came in undiagnosed and was

discovered post-operatively. We suspect this patient has a pre-operative hypertension apparently masked by the haemoperitoneum. This case highlights again the need of good history taking and the need for routine medical check-up in middle aged and elderly in our environment. The patient on close questioning post-operatively denied any previous history or treatment for hypertension. She was being made aware of hypertension and its implications/complications for the first time. The sequela of left hemiplegia in this patient is a timely reminder of the heavy price to be paid when an untreated and undiscovered hypertensive is subjected to the stress of surgery. Here again the attending Physician cannot be more circumspect.

The management of hypertension is detailed in most standard textbooks. This is a plethora of drugs for treatment but it is usual to start with a single drug – either a diuretic (a thiazide) or a calcium channel blocker (Nifedipine) and move rapidly to a combination therapy if the monotherapy proved ineffective or inadequate (8,10,11). These medications should be combined with life-style modifications. Once the blood pressure is controlled, surgery can then be carried out. It is advised that the anti-hypertensive be taken up to at least two hours before surgery. This has been found to decrease intra-operative blood pressure fluctuations and protect against myocardial ischaemia associated with endotracheal intubation and the stress of surgery (12). If the hypertension is discovered accidentally pre-surgery and the patient presents with a life-threatening surgical condition, parental or sublingual anti-hypertensive preparations are used to bring the blood pressure under control before surgery. However, if the hypertension is discovered for the first time in a patient presenting with an elective surgical condition, the surgery is postponed, the diagnosis of the hypertension is confirmed and investigated. This eventually resolves the patient into either of the two categories – essential or secondary hypertension, which is treated before surgery. A balance needs to be struck here between the physician's inclination to have a leisurely smooth control of the hypertension and the surgeon's desire to get on with the surgery. It cannot however be over-emphasized that the control of the hypertension is a must before surgery for surely there must be few instances if any, where a vegetable of a patient post-operatively, is a preferred outcome.

Post-operative hypertension, if not pre-existing, is usually transient. The basic strategy is to remove the underlying cause- analgesia for pain, maintenance of a clear airway and administration of oxygen for hypercarbia and judicious use of intravenous fluids and blood.

The main goal of the surgically remediable hypertension is to remove the cause after adequate control of the hypertension in preparation for surgery. The BP must be monitored intra-operatively, and post-operatively and adequate measures taken to control it. The ideal situation is to see the patients before the hypertension is established with end organ changes.

The choice of anaesthesia is very crucial in surgery on the hypertensives. Local anaesthesia with sedation is recommended for peripheral lesions whilst regional

anaesthesia-epidural/spinal or nerve blocks are recommended for the lower extremities, pelvis or lower abdomen (5). Even when general anaesthesia can be avoided as in above, it is important to remember that patients are still subject to the usual risks associated with hypertension and therefore the BP must be monitored and controlled. Local anaesthetics with vaso-constricting drugs are also to be avoided.

When there is a swing of blood pressure during surgery in controlled or uncontrolled hypertension, the minimum necessary surgery is done quickly for the patient. Monitoring of the patient and meticulous use of intravenous fluids and analgesia intra- and post-operatively are pre-requisites for a successful outcome.

Phaeochromocytoma is in a class by itself. The dramatic symptomatology and sudden death of patients down the ages have been a nightmare to both patients and the attending physicians alike. The first description of the condition was by Frankel in 1886, who reported bilateral adrenal tumours at autopsy in an 18 year-old girl, who died suddenly (13). Labbe and Associates in 1922 also reported a 28 year-old woman with paroxysmal hypertension, who at autopsy was found to have a phaeochromocytoma (13). In pregnancy the mortality of a mother and child is 50% (14).

Mayo reported the first successful removal of a phaeochromocytoma in the USA in 1927 while Von Euler and Associates demonstrated increased urinary catecholamines in patients with these tumours (13). The symptom complex can be ameliorated by blocking these catecholamines and this is necessary to prevent hypertensive crisis especially during surgery (15). The diagnosis and localization now rest principally on biochemistry and I-<sup>131</sup> MIBG scan. Neither of these was available to us (vide supra). The diagnosis in our patient was made only on clinical ground pre-operatively. The case is extra-adrenal but there is nothing in the history – physical examination or radiological imaging to suggest the possibility of multiple endocrine neoplasia type II.

The surgery of phaeochromocytoma, as is obvious from our patient is still full of drama and palpitation for both Surgeons and Anaesthetist. The hypertensive/hypotensive crisis during the resection of this tumour can still pose a nightmare. Preloading with intravenous fluid and rendering the patient “autonomically neutral” with epidural anaesthesia before the administration of general anaesthesia is one of the several attempts (16) to combat this problem but the best is still to come. The standard treatment now is laparoscopic adrenalectomy for those located in the adrenals, which constitute about 90% of the cases (15 & 17).

It is obvious from the two patients presented that the morbidity may not be a direct consequence of the surgery but of the co-morbid condition. It behooves the attending surgeon, therefore, to be familiar with the management of this condition and must aim to operate on a well controlled hypertensive.

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