

Management of abdominal aortic aneurysm in a resource-limited context: About one case repaired on at Katana Referral Hospital, South Kivu, in the Democratic Republic of Congo.

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June 14, 2023

## CASE REPORT

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## Abstract

### Introduction

Abdominal aortic aneurysms (AAA) more commonly affect men than women and are estimated to affect 4% to 8% of men older than age 60 years. Mortality caused by a ruptured AAA is high, but elective repair is an effective and relatively safe intervention.

### Case's presentation

A 63-year-old woman previously suffering from arterial hypertension and obesity, came to the Emergency Department because she consulted for abdominal pain of gravity type evolving for about 3 months, occurring during a lifting of a bucket of water, followed by orthostatic palpitations of sudden onset, of great intensity and a loss of consciousness with sudden remission.

The evolution was marked by loss of consciousness on 3 occasions, and pain with sensation of a pulsating mass in the left flank, which have motivated the consultation at the General Hospital of Reference Dr. Rau Ciriri where a diagnosis of abdominal aortic aneurysm was made and a transfer to the General Hospital of Reference of Fomulac was decided for better management. We managed the patient by performing an open sky surgical repair using an endoprosthesis and she recovered without complications.

### Conclusion

Abdominal Aortic Aneurysm is a rarely diagnosed condition in resource-limited areas. In the Democratic Republic of the Congo, data on AAA are not available in the literature, so this case contributes not only to the show improvement of the management of AAA and to the advocacy of providing sufficient surgeons and equipment in a limited resources context

**Keywords:** cardiothoracic surgery, vascular surgery, ageing, abdominal aortic aneurysm, endovascular aneurysm repair, Katana

### Introduction

Aortic aneurysm is defined as a permanent segmental dilatation, greater than 50% of the normal diameter of the proximal aortic segment<sup>1</sup>. This dilatation can be baggy or spindle<sup>2</sup>. In practice, according to the French Society for Vascular Medicine, an abdominal aortic aneurysm is suspected when the antero-posterior diameter exceeds 3 centimeters. All territories of the aorta may be involved, but the most frequent is the one located in the sub-renal area followed by popliteal aneurysms<sup>3,4</sup>.

Aortic aneurysms are important causes of mortality, in developed countries such as in the United States of America where, arterial aneurysms and their ruptures were responsible for approximately 15,000 deaths per year in 2013 and this could be just the tip of the iceberg<sup>1</sup>. Studies have shown that the incidence of ruptured abdominal aortic aneurysms (AAA) in sudden deaths is 4 to 5%. The number of deaths due to AAA rupture would then amount to 3000/year, a mortality comparable to that of prostate cancer (32,000) and breast cancer (42,000)<sup>5</sup>;

In sub-Saharan Africa, arterial aneurysms are uncommon and probably poorly evaluated, as the situation is particularly characterized by a scarcity of vascular surgeons and an insufficient technical equipment's. Nevertheless, with the aging of the population and the increase in cardiovascular risks, the incidence of aneurysms is beginning to rise. It has been reported in Mali in 2009, over a period of 2 years, 7 cases of AAA, whereas 30 cases were collected over a period of 16 years in South Africa<sup>6</sup>. In Madagascar, data on the pathology of sub-renal aortic aneurysm are still rare, no protocol has been established for its surgical management<sup>1</sup>.

The main risk factors for developing an abdominal aortic aneurysm are age, male gender, hypertension and hypercholesterolemia, smoking and family history of aneurysmal pathology<sup>7</sup>.

Indeed, the male population over 65 years of age is the most affected and represents 5% of aortic aneurysmal pathology, moreover with equal diameter, the risks of rupture are higher in women and the reasons evoked are accelerated growth in women as well as aneurysmal dilatation<sup>5</sup>. The antero-posterior diameter is the main risk factor, if any AAA can rupture and the risk of rupture increases with the AP diameter of the AAA. The threshold of 55 mm of AP diameter appears to be particularly significant, many studies have been devoted to the risk of rupture according to the diameter of the AAA, a synthesis has been proposed by the joint council of the American Association for vascular Surgery and Society for Vascular Surgery according to which the risk of rupture is imminent at this stage<sup>8</sup>.

The majority of AAAs are asymptomatic and are detected as an incidental finding on ultrasound, abdominal CT, or magnetic resonance imaging performed for other purposes. It may also manifest as abdominal pain or complications such as thrombosis, embolization and rupture. Approximately 30% of asymptomatic AAAs are discovered as a pulsatile abdominal mass on routine physical examination<sup>8</sup>.

Repair options include surgical repair (including trans-abdominal or retroperitoneal) or endovascular repair, the latter of which involves insertion of a stent graft into the lumen that effectively excludes the aneurysm from blood flow, thereby minimizing the risk of rupture; endovascular repair of an AAA is a less invasive and less expensive alternative to open surgical repair. The short-term success rate for endovascular aneurysm repair ranges from 83% to more than 95%. For surgical repair, 30-day mortality in the major randomized trials ranges from 2.7% to 5.8% and is influenced by the volume of procedures performed in the hospital and the expertise of the surgeon. One review concluded that all-cause mortality at 30 days post-procedure was significantly lower with endovascular repair compared to surgical repair at 1.6% versus 4.8%, however, studies have shown no long-term benefit of the endovascular approach compared to surgical repair at one to two years<sup>8</sup>.

In the Democratic Republic of Congo, to our knowledge, there was no published data found on AAA, hence we aimed at reporting two cases operated on at the Department of Surgery of Referral Hospital of Katana.

### Case presentation

Patient of 63 years old, who came to consult for abdominal pain of gravity type evolving for about 3 months, occurring during a lifting of a bucket of water, followed by orthostatic palpitations of sudden onset, of great intensity and a loss of consciousness with sudden remission, the evolution will be marked by loss of consciousness on 3 occasions, and pain with sensation of a pulsating mass in the left flank, which would have motivated the consultation at the General Hospital of Reference Dr. Rau Ciriri where a diagnosis of abdominal aortic aneurysm was made and a transfer to the General Hospital of Reference of Fomulac was decided for better management

She did not recognize herself as hypertensive, neither diabetic nor cardiopathic, did not take alcohol, G9P7A2Ev7, postmenopausal for more than 10 years and was not on any particular anticoagulant treatment with no fever, no headache.

On physical examination: general condition preserved and vital signs were within norms: blood pressure: 130/70mmHg, heart rate: 98bpm, respiratory rate: 22cpm, temperature: 36.1 Celsius degree and anthropometric parameters: Weight: 110kgs, Height: 1.72m BMI: 37.9kgs/m<sup>2</sup>

Colored palpebral conjunctiva, an icteric bulbar conjunctiva, clean mouth, moist tongue, free cervical and head ganglion areas, supple neck, and no turgid jugular veins. Thorax: symmetrical, eupneic, clear lungs.

Cardiovascular examination reveals regular heart, slightly tachycardia, first and second sounds audible without pathological noises, warm extremities, and capillary recoloration time inferior to 3 seconds, peripheral pulses palpated and synchronous.

The abdomen was following the respiratory movements, there is a large adipose pannicle, liver and spleen not palpated, presence of a more or less firm mass, linear at the level of the left flank, pulsatile and synchronous with the heartbeat, continuing with the spleen, peristalsis present

We concluded to: pulsatile mass of the abdomen: Abdomino-thoracic aneurysm or Angioma and a metabolic syndrome: Arterial hypertension and Obesity

Para clinical examination:

Hemoglobin: 13.2g/dl Clotting time: 4'30" Bleeding time: 1'30 "Blood type: O rhesus + Serology: HIV: negative, HBS: negative and HCV: negative Blood glucose: 127 mg/dl

Angio-scan reveals an aneurysmal dilatation of the abdominal aorta (Figure 1). This dilatation begins just after the emergence of the renal arteries and extends upstream of the bifurcation of the primitive iliac. Its major axes 70 x 69 mm (LL x AP). Its height is 129 mm. Its posterior wall presents a thrombus of 34 X 20 mm X 51 mm (LL X AP X CC). The supra renal aorta has a tortuous course; its diameters are 22 X 23 mm (AP X LL). Liver size and contours within the norms. Small hypo intensive and non-enhancing lesion of 7 mm in segment VII: Biliary cyst a priori. No dilatation of the intra- or extra-hepatic bile ducts. Normotensive gallbladder with homogeneous content. Homogeneous enhancement of the pancreas. Thin adrenal glands. Kidneys of normal size and topography, with symmetrical parenchyma. No hydronephrosis. Bladder not very full, with thin wall and homogeneous content. Normal arrangement and size of the digestive tracts. Homogeneous enhancement of their walls. Multiple calcifications of the pelvis: probable phleboliths. No ascites or adenomegaly along the major vascular axes. No suspicious nodule at the pulmonary bases or pleural effusion. No suspicious bone lesions. Degenerative remodeling (lumbar spondylosis) multistage predominantly in L5-SI or they are responsible for a grade I anterolisthesis. Also, moderate bilateral sacroiliac osteoarthritis.

Conclusion: A saccular aneurysm of the infra-renal abdominal aorta with a posterior intramural thrombus is retained.

We managed the patient by performing an open sky surgical repair which steps were these one hereafter: the patient was installed in dorsal decubitus position under general anesthesia, extensive disinfection of the surgical site and sterile drape. Vertical incision above and below the umbilicus, dislocation of the duodeno-jejunal angle: progressive aneurysm at the right and superior mesenteric border up to the level of the inferior border of the left renal artery, sub-renal aorta well visualized and ready to be dissected. Opening of the sigmoid peritoneum up to the bifurcation of the primitive iliacs. Continuation of dissection exposing the primitive iliacs while sparing the right ureter. Subrenal clamping of the aorta and two primitive iliacs. Opening of the aneurysm, blood aspiration, removal of thrombi as you can see on figure 2.

Hemostasis control of thrombosed vertebral and middle sacral arteries, inferior mesenteric arteries. Control of hemostasis with 4/0 prolene, placement of the 14mm prosthesis and proximal suture with 2 hemi-overlays with 5/0 prolene, distal suture with 2 hemi-overlays with 5/0 prolene as you can see on figure 3. Perfect control of hemostasis. Clamping: the suture is tight. Closure of the aneurysmal wall covering the prosthesis, closure plane by plane and betadine dressing as you can see on figure 2. We got immediate postoperative awakening and postoperative monitoring did not notice any particularity. We kept her in the hospital under ciprofloxacin 2 times 400mg per day, Metronidazole 3 times 500mg per day, Enoxaparin 2 times 0.8mL per day, and paracetamol 2times 1grams per day, Tramadol 3 times 100mg per day, and Diclofenac 2times 75mg per day. We discharged her 12 days post-surgery under low-dose aspirin 100mg per day. We saw her 3 months and 6 months after discharge and all parameters were normal.

## Discussion

In the Democratic Republic of the Congo, data on AAA are not available, so the report of this case contributes to the improvement of the management of AAA in its Eastern part particularly in a limited resources context.

Several risk factors have been previously described to be associated with AAA. Among them, age superior to 65 male gender family history of AAA smoking habits and cardiovascular comorbidities like obesity hypercholesterolemia except diabetes are known<sup>8-10</sup>.

As far as our patient are concerned, cardiovascular comorbidities were the one found; arterial hypertension

and obesity. Contrarily to what has been described in the literature about male gender association with AAA our patient was female and as said before at the same advanced age, women are more exposed to the risk of ruptured of AAA.

AAA are most of times asymptomatic and when symptomatic, sensation of a pulsatile mass reveals it. Furthermore some AAA become symptomatic at the catastrophic stage of rupture. Abdominal pain palpitations loss of consciousness and sensation of a pulsatile mass in the left flank were the majors symptoms that motivated our patient to consult in a referral hospital and the only particularity found on his physical examination was a pulsatile abdominal mass that was also the major clinical sign found in our patient as it remains the main founding in approximately 30% of AAAs clinically<sup>11</sup>.

Imaging reveal that our AAA was located in the sub renal area and it has an AP diameter of 69 mm within it posterior wall a thrombus of 34 X 20 mm X 51 mm (LL X AP X CC). These finding corroborated what is described in the literature. In fact it has been described that more AAA was located in the sub renal area, and the AP diameter superior to 65mm is the risk factor of rupture of AAA according to the joint Council of the Society for Vascular Surgery Practice<sup>12</sup>.

Preventive treatment consist on prevention of cardiovascular comorbidities and more frequented checkup when there is a family history of AAA or at a certain advanced age<sup>13</sup>. Currently, it has been described that endoscopic treatment is the gold standard in AAA repairs by endoprothesis. Open surgery did not lose it place especially then the AAA is already ruptured and the one who is practiced in some remote areas like ours<sup>11</sup>. Although it has been so many postoperative complications of which vascular (thromboembolic, hemorrhagic), cardiac (a cardiac insufficiency or disorder of the rhythm, a myocardial suffering), pulmonary (the basic pneumopathies), renal (tubulopathies), septic are expected our patient did not developed no one of them from the surgery to discharge<sup>9,10,13</sup>. There were not any immediate or delayed pot operative noticed at discharge and 3 months' check even at 6 months' check,

## Conclusion

Abdominal Aortic Aneuvrysm is a rarely diagnosed condition in resource-limited areas. Its management need both trained surgeons and equipment to ensure good outcome. More efforts should be done to provide these resources to low income countries.

## Author's contribution

CM and ABB draft the first manuscript. WM, MBA and GBM revised edited the whole text. All authors have revised and accepted the last version of the current version of the paper.

## Ethical consideration

Written informed consent was signed by the patient prior to the publication of this paper.

## Conflicts of interests

Authors declares to have not any existing conflicts of interests

**Acknowledgements** : GBM is thankful to BEBUC scholarship system and its partners are Else-Kröner-Fresenius-Stiftung for their support.

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## Figure legends

Figure 1: Angio-CT demonstrating aortic abdominal aneurysm

Figure 2: Per operative images showing opening of the aneurysm and, removal of thrombi

Figure 3: Per-operative image showing the prosthesis









