

# Management of Ruptured Abdominal Aortic Aneurysm in Libya, a Single Centre Experience

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## ABSTRACT

Without urgent repair, ruptured abdominal aortic aneurysm (AAA) is a fatal condition, with overall mortality rate exceeding 85%. About 50% of patients with ruptured AAA die before reaching the hospital; half of those arriving to emergency department, do not reach the operating theatre and, only half of the operated cases survive. Twenty one patients (nineteen males and two females) who underwent open repair for ruptured AAA, between January 2005 and December 2008, were retrospectively evaluated at the vascular surgery department of Tripoli Medical Centre.

The perioperative mortality rate was 28.5% (six patients) and, the morbidity was 23.8% (five patients). Computed tomography (CT) scan has been done for all patients in our study, this always led to delay in the management of the ruptured AAA. Moreover, other delaying factors such as; not using the cell saver and, the delay in preparing blood for transfusion during surgery, were also involved in the overall delay. Despite these negative factors, still mortality and morbidity rates in our study matched the international standards.

**Keywords** - Ruptured abdominal aortic aneurysm; Endovascular aneurysm repair.

## INTRODUCTION

Vesalius was the anatomist to first describe the Abdominal Aortic Aneurysm.<sup>1</sup> AAA is largely seen in elderly white than black men; with a ratio of 2:3 and, 6:2 more common in men than in women. Up to 95% of AAA affects the infra-renal part of abdominal aorta.<sup>2</sup>

Ruptured AAA is described as, a disruption of a dilated aortic wall that leads to bleeding into the retro-peritoneal or, intra-peritoneal space or both.<sup>3</sup>

When the diameter of the dilated aorta is 6 cm or more, the risk of rupture is about 43%, ruptured AAA are associated with significant morbidity and mortality, where half of the patients died before reaching the hospital and, almost half of those arriving in emergency department, do not reach the operating theatre and, moreover, half of the operated cases died, in another word, the mortality rate is about 80 to 90% for unoperated cases and, about 40 to 50% for the operated ones.

In the United States over 15,000 patients die each year from ruptured AAA.<sup>4</sup> In a recent 50 year meta-analysis of published literature<sup>3</sup>, the overall operative mortality rate, for patients with ruptured AAA who underwent open repair was 48%.

The open repair is burdened with high perioperative mortality and morbidity; however, the introduction of endovascular aneurysm repair (EVAR) for patients with ruptured AAA, the mortality rate decreased to 30%.<sup>5</sup> This technique has initiated a debate among the vascular surgeons, ended by the fact that, the minimally invasive

EVAR procedure is safer than open repair and, should be considered as the first line of management, although, compared to open repair, the long term efficacy of EVAR remains unknown, therefore, the endovascular approach should be reserved to high risk patients only.<sup>6,7</sup>

Sealed ruptured AAA presents both diagnostic and, surgical challenges that can be adequately managed, achieving in the short run, postoperative mortality and morbidity rates, that are similar to un ruptured AAA, however, in the long run, presents high mortality rates compared with elective repair.<sup>8</sup>

## MATERIALS AND METHODS

Patients who underwent open repair of ruptured AAA, in the department of vascular surgery at Tripoli Medical Centre (TMC), over a period of 48 months between January 2005 and December 2008, were retrospectively studied, all of the three surgeons participated in this study were involved.

## RESULTS

21 patients (19 males, 90.40% and 2 females, 9.6%) were admitted with ruptured AAA during the study period, they underwent the classical open repair; their ages were between 25 to 76 years old, with median age of 61.5 years (Figure 1).

All of the studied patients presented with abdominal pain; three came in shock, two due to aorto-duodenal fistula (Figure 2), one due to aorto-caval fistula (Figure 3) and,

two due to right iliac fossa pulsatile mass and pain, the last two, were primarily misdiagnosed in other surgical departments as appendicular mass. All of the patients were diagnosed in our department as ruptured AAA and, underwent operations (Figure 4). One patient presented with bleeding per rectum as a result of compression of ruptured left iliac aneurysm of sigmoid colon. Simple leaking is the most common intra-operative finding compared to Aorto-duodenal and Aorto-caval fistulae (Figure 5).



Figure 4: Intra operative RAA.

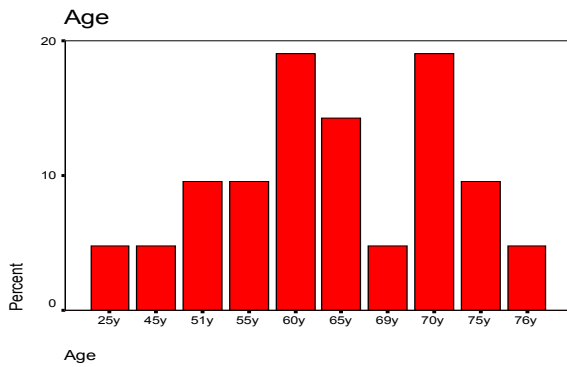


Figure 1: Ages of patients with ruptured AAA.

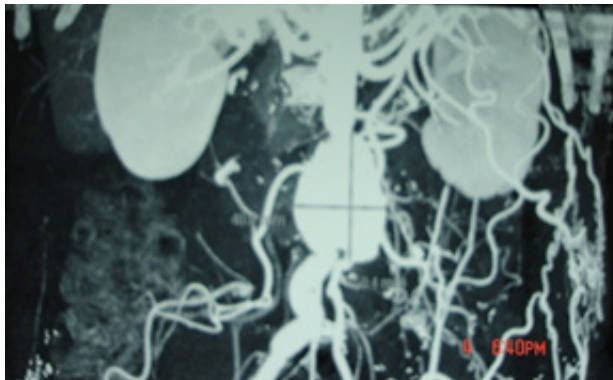


Figure 2: Contrast enhanced computed tomography showed false aneurysm at the proximal anastomosis post Aorto- bi-iliac bypass in a patient with Aorto- duodenal fistula.

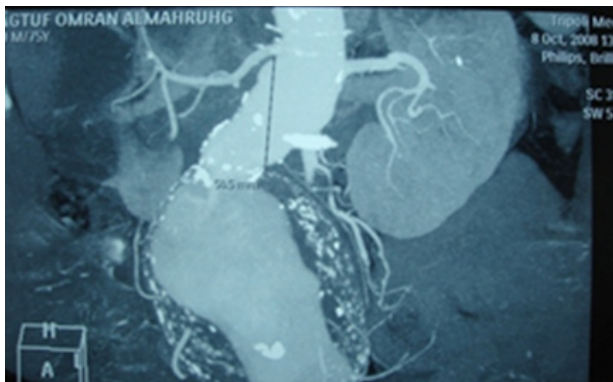


Figure 3: Contrast enhanced computed tomography aortic aneurysm AAA with Aorto-caval fistula.

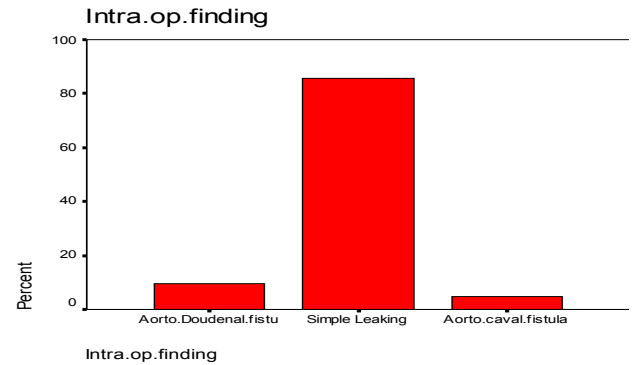


Figure 5: Simple leaking compared to Aorto-duodenal and Aorto-caval fistula ruptured left iliac aneurysm of sigmoid colon.

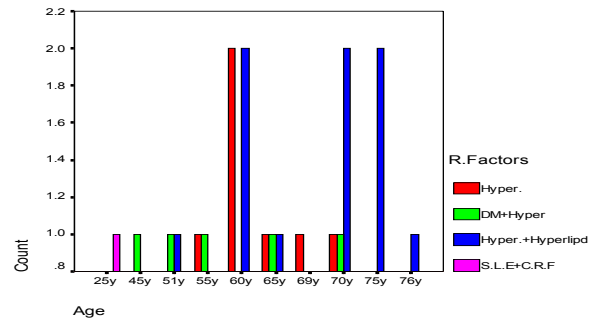


Figure 6: Age-Risk factors cross tabulation.

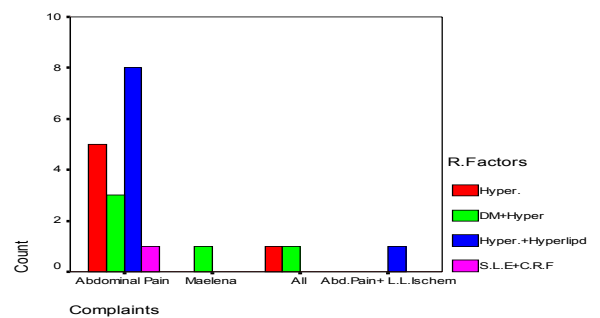
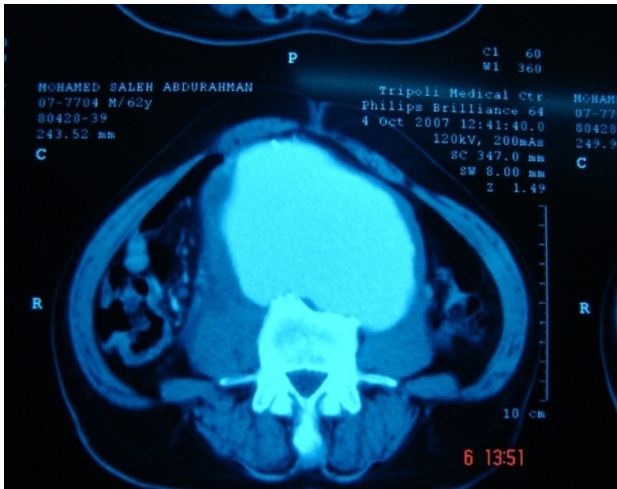


Figure 7: Complaints-Risk factors cross tabulation.



**Figure 8:** Contrast enhanced computed tomography Ruptured AAA with maximum diameter 120 mm.

Of the twenty one studied patients, twenty were suffering from arterial hypertension as a risk factor, five of them were diabetic and; one female patient was suffering from chronic renal failure and systemic lupus erythematosus (Figures 6 and 7). CT scan was performed as a confirmative and differential diagnosis for all of the studied patients; blood transfusion was used for all patients intra and postoperative, without the use of cell saver.

## DISCUSSION

CT scan is not a totally benign intervention, especially if the patient is not hemodynamically stable and, always there is lag time to complete CT scan, that sometimes, might lead to losing the patient (Figures 8 and 9).<sup>9,10</sup>

Death resulting from ruptured AAA is potentially preventable. Screening for AAA is cost effective reducing the risk of AAA related death by as much as, 50%. Therefore, the needs to identify subgroups with increased prevalence of AAA remains important.<sup>11</sup>

Infrarenal AAA ruptures either, posteriorly into the retroperitoneal cavity in approximately 80% of patients and, anteriorly into the peritoneal cavity in approximately remaining 20% of patients.<sup>12</sup> Rarely; AAA may rupture into the abdominal veins or the bowel. This may or may not be associated with retroperitoneal rupture.

Patients with a primary aortoduodenal fistula, commonly present with upper gastrointestinal haemorrhage (haematemesis, melaena, haematochezia). Abdominal pain and a pulsatile abdominal mass may also be present; however, rarely patients present all of the three findings.<sup>12</sup> Approximately, 3 to 4% of patients with ruptured AAA have aortocaval fistulae. As a matter of fact, aortocaval fistulae are probably missed in about 50% of patients and, are accidentally discovered during elective repair of AAA.<sup>12</sup>

A large randomized trial of open and, endovascular repair for ruptured AAA is needed, to identify the magnitude of any mortality prevention benefit associated with EVAR. The groups most likely to benefit from EVAR management,



**Figure 9:** Contrast enhanced computed tomography Ruptured AAA with huge retroperitoneal haematoma.

are those with immediate access to emergency abdominal C.T scan, in addition, improving the anaesthetic and post-operative care, is necessary to reduce the mortality from rupture AAA.<sup>13,14</sup>

Although the perioperative mortality rates of ruptured AAA in USA is considered high (up to 50%).<sup>4</sup> In comparison; our study revealed mortality rates of only 28.5%. The delay in starting the operation was mainly as a consequence of, the delay in doing CT scan and, collecting and preparing blood for transfusion which took about 3 to 4 hr. Not using cell saver in addition to, the delaying factors indicated above, should have increased the mortality rate, however, perioperative mortality rate in this study was maintained 28.5% which matches literatures.

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