A Single Center Experience with Management of Ruptured Native Aortic Infection (RNAI)

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Introduction

Ruptured native aortic infection (RNAI) without aneurysmal degeneration is rare with no consensus on timing and steps of surgical management. There are few case reports in circulation that describe this phenomenon, but there is little consensus on management strategy. Upon review, current case reports describe infections with staphylococcus, Salmonella, mycobacterium bovis, streptococcus pneumoniae bacteremia, spondylitis, and most commonly a psoas abscess eroding the aortic wall which rarely results in non-aneurysmal aortic rupture. [2-4]

Primary treatment is traditionally surgical aortic reconstruction, but the risk of emergency surgical treatment is high. Endovascular aortic stent-graft implantation can be lifesaving in this setting by stopping the bleeding. However, the crucial question of durability and late infections remains unanswered, warranting long-term antibiotic treatment and follow-up. [3]

We classify patients with RNAI into hemodynamically stable vs unstable (SBP <90, requiring vasopressor support, Hgb <7, altered mental status). We then attempt to create a pathway to aid in the decision-making process for RNAI regarding endovascular salvage and staging for definitive repair vs abscess drainage followed by definitive repair. Also, we seek to identify the importance of abscess drainage as vital when staging these procedures.

Objectives

- To define Ruptured Native Aorta
- To create a decision-making model for aortic repair in RNAI
- To identify the vital role of abscess drainage in RNAI

Materials & Methods

From January 2021 to May 2023, a total of 6 patients with RNAI presented to our institution. The diagnosis was based on: clinical presentation, laboratory and intraoperative findings, and imaging findings. The primary endpoint was 30-day mortality, and the secondary endpoints were in-hospital mortality, graft patency, and freedom from reinfection.

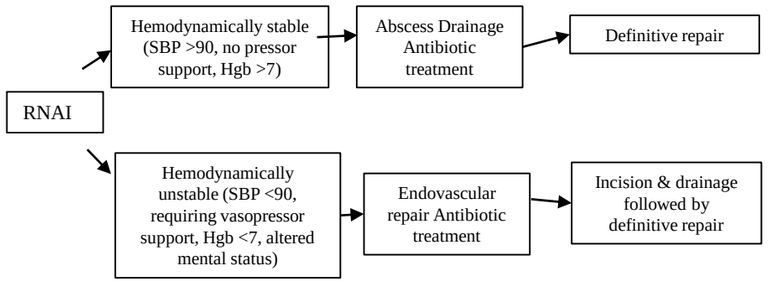

Figure 1: Proposed Model for triage and management of RNAI

Summary of RNAI Etiology, Characteristics, and Repair

Patient #	Mechanism of infection	Cultures	Hemodynamic stability	Level of rupture	Repair	Complications
1	T11-12 osteomyelitis	Osteomyelitis (+) MRSA	Stable	Supra celiac aorta	Aortic cuff stent graft placement	None
1	Infected penetrating ulcer	(+) MSSA Bacteremia	Stable	Right renal & SMA	Open repair of infected thoracoabdominal aorta	BLE paralysis
3	Mycotic aneurysm	(+) MSSA Bacteremia; Scedosporidium	Stable	Infra-renal aorta	Open aorto-biiliac repair with rifampin soaked dacron graft	None
1	Psoas abscess	Blood cx: Brucella abortus graft infection	Hemodynamic instability	Infra-renal aorta to common iliac	EVAR, staged ex-lap, I&D of abscess, explantation with staged [illegible] repair	None

Table 1: Summary of the characteristics of the 6 patients who experienced RNAI

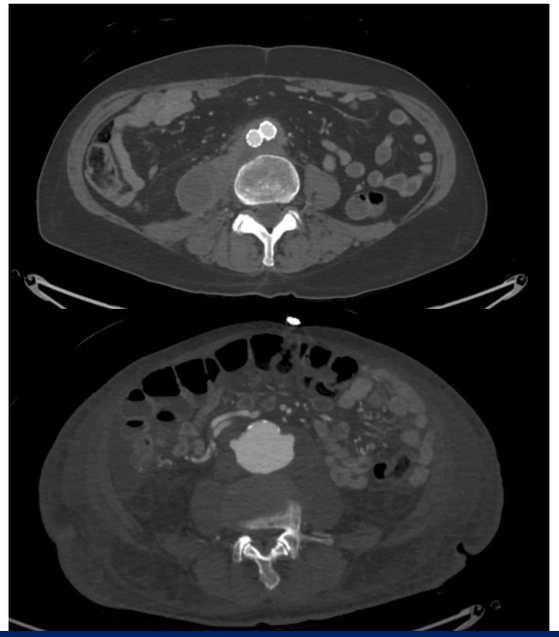

Figure 2: Psoas abscess before drainage after EVAR to treat RNAI in hemodynamically unstable patient

Figure 3: Posterior wall with calcification, breakdown, and contained rupture

Results

The mean age of our patients was 65 (range 58 to 82) with diseases at the level of thoracoabdominal (n = 1), supra-renal (n = 1) and infra-renal (n=4) aorta. All **six** patients had atherosclerotic plaque at sites of rupture with unique comorbidities that would explain bacterial seeding from remote/adjacent origins: end stage renal disease (ESRD); orthotopic heart transplant on immunosuppression with psoas and hepatic abscesses; T11-12 osteomyelitis; recurrent urinary tract infections; and occupational hazard. Preoperative signs of infection such as leukocytosis or fevers were found in 3 patients (**50**%). All six (100%) patients had positive blood cultures. No mortality had occurred in 30 days and mid-term follow-up. The grafts' patency and freedom from reinfection were 100%.

Conclusions

Management of RNAI requires a multidisciplinary team with expeditious diagnosis and treatment. In this study, we classify patients into hemodynamically stable vs unstable patients and direct appropriate staged therapy. The hemodynamically unstable patients underwent endovascular repair, antibiotic therapy, and were brought back for incision and drainage followed by definitive repair. The hemodynamically stable patients underwent abscess drainage, antibiotic treatment, and then staged definitive open repair.

We propose that the associated mortality can be decreased by staging the definitive repair with endovascular salvage and/or source control, if possible, with drainage and copious antibiotic irrigation followed by definitive treatment. In our short- and mid-term experience, this approach shows promise with high graft patency and no perioperative mortality or re-infection. A consensus on RNAI definition and management is needed with the help of multi-institution study to develop treatment algorithms

References

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