Analysis of time to treatment of patients presenting with ruptured aortic aneurysm (rAAA) as part of the IMPROVE trial in a single center

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Study Objectives

1) Evaluate factors that affect time taken to receive definitive treatment, either endovascular repair (EVAR) or Surgery

2) Assess if time to scan impacts time to definitive treatment.

Introduction

Ruptured Abdominal Aortic Aneurysm (rAAA) is one of the most dramatic emergencies in medicine. In the US, 4-5% of sudden death is attributed to rAAA[1]. Without surgical or endovascular repair, the outcome is almost always fatal[2]. The likelihood of aneurysm rupture is dictated by multiple factors including size, expansion rate and sex. For those incidentally diagnosed aortic aneurysms 5.5cm, the cumulative rupture rate of population based samples is 25-40%[1]. As a result, the importance of correct treatment and approach for this highly unstable pathology is paramount for vascular surgeons and interventional radiologists.

The IMPROVE Trial was set up to compare the 30 day mortality from ruptured aortic aneurysms in those patients treated with endovascular repair versus those treated with open repair at major vascular centers in the United Kingdom[3].

As a center that is part of this trial, there is a need to perform a CT angiogram (CTA) in patients with suspected rAAA in order to evaluate patients for endovascular repair (EVAR). In our center all patients end up having a CT scan irrespective of the group they are randomised too.

Utilising this population group, we aimed to evaluate the pathway of treatment for rAAA at Hull Royal Infirmary comparing delivery of treatment outcomes in EVAR and Open Repair patients.

Standards

Currently there are no standards regarding time of arrival to time to scan and subsequent treatment.

Survival rates for those patients who present to hospital and undergo surgical or endovascular intervention is around 50%[1].

Methods

Local population taken from the IMPROVE trial between 2010-2012

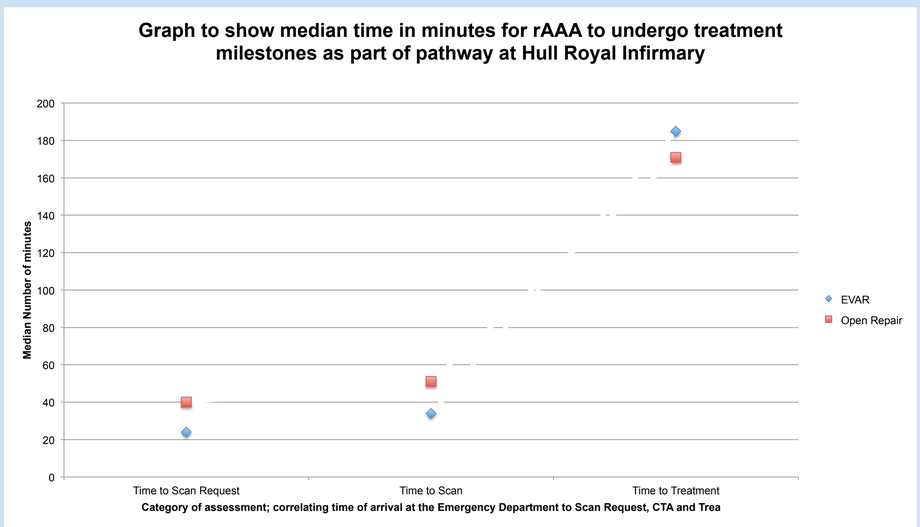
Data was collected on:
1) Day and time of arrival to Emergency Department.
2) Time of electronic scan request.
3) Time of CTA scan.
4) Time of Treatment.
5) Time of CTA scan to Treatment.
6) Survival Outcome.

Data was sourced from electronic records and PACS.

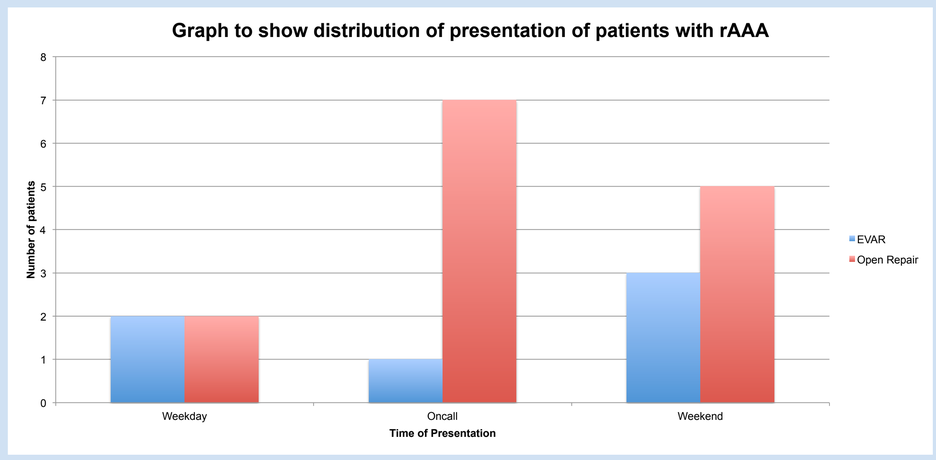
The data analysed included the time from arrival to scan request (SR), to scan (S) and to treatment (Tx). The ANOVA statistical analysis was used to correlate the mean SR, S and Tx.

Results

20 patients were randomised with rAAA; 6 to EVAR, 14 to Open repair (5 of these had been randomised to, but were unsuitable for EVAR)
Analysis was performed using ANOVA.
EVAR Mean SR = 55mins Standard deviation (SD) 90; S = 68 mins SD 132; Tx = 210 mins SD 85. Correlation of SR and S to time of Tx *p = 0.03.*
Open Repair Mean SR = 60mins SD 70; S= 85mins SD 193; Tx = 251 mins.
Correlation of SR and S to time of Tx *p = 0.0001*



The mean SR to S time is 15.2 minutes. The main limiting time to getting the patient to scan is the time of scan request. Only 4 patients presented during normal working hours (2 EVAR; 2 Open).



The 30 day survival at Hull Royal Infirmary = EVAR 100%; Open Repair 57%

Conclusions

1.Time to scan correlates to time of commencement of definitive treatment.

2.The time to scan is not affected by patient presentation out of hours.
This could be attributed to the Consultant led Vascular and Interventional Radiology Service at Hull Royal Infirmary.

3. An area of limitation is the time taken to get the patient to interventional or surgical theatre after diagnosis.

4. Patients received their CTA within a mean of 15 minutes of request, which correlated to quicker instigation of treatment with positive diagnosis.

References

1.Aggarwal S, Qamar A, Sharma V. Abdominal Aortic Aneurysm: A comprehensive review. Exp Clin Cardiology. Vol 16 No1 2011

2.Jeffrey J, Thompson RW. Management of Symptomatic (Non Rupture) and Ruptured Abdominal Aortic Aneurysm.

3. http://www.improvetrial.org

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