

INVITED COMMENTARY

Ruptured Abdominal Aortic Aneurysm Treatment; it is time to change things

Konstantinos Papazoglou, Ioakim Giagtzidis

Vascular Surgery Unit, 5th Department of Surgery, Medical School, Aristotle University of Thessaloniki, Hippokratio Hospital, Thessaloniki, Greece

The treatment approach of Ruptured Abdominal Aortic Aneurysm (RAAA) still remains a controversial field in vascular surgery community mainly, because of the mortality it carries. We still cannot recognize the point of no return for each individual patient, although this is inevitable for some patients who arrive at the emergency department. And since mortality is always present and mostly unaffected, there will always be a challenging effort to improve treatment results.

As presented by Matsagkas et al.¹ the new approach with the endovascular treatment of the ruptured AAA offers several important advantages and is recommended from Vascular societies globally. Minimizing trauma, avoiding general anesthesia, and difficult dissections during aortic exposure as well as avoid clumping in the presence of retroperitoneal hematoma are some of the benefits that indicate possible improvement in survival following the new approach. Even more as we noticed with our experience during the last two decades, the evolution in the performance and efficiency of endovascular grafts has widened the anatomical applicability, safety and technical success rate of the procedure.² Low profile, suprarenal fixation with barbs and accurate deployment are important features that increase the chances of successful RAAA treatment.

Unfortunately, the multicenter randomized controlled trials conducted failed to prove the superiority of endovascular approach³⁻⁵ which is observed in the results of experienced vascular units.⁶ There are some explanations of this fact. First of all, as thoroughly described by the authors, a carefully designed protocol in a dedicated vascular center, concerning this new approach that is dependent on technology and proper equipment, is necessary as already shown in several centers.⁷ As easy as it sounds, such an algorithm is quite difficult to be established, especially in a Greek Hospital which is usually understaffed and lack of technical resources is a usual condition. Another very important aspect of the procedural success is the experience of the operator which is often limited concerning endovascular treatment. The latter, was one of the main reasons for selecting open treatment and crossover between

the groups in many trial cases, leading to bias in patient selection. As described from a number of dedicated centers^{8,9} and also the authors opinion, the absolute endovascular first approach in all RAAA cases, could be a better solution in order to reduce overall mortality, leaving open conversion and repair in case of EVAR complication and technical failure. This can be achieved with chimney renal reperfusion or with debranching of the abdominal branches after graft deployment in cases of short or no proximal neck. As already described, this group of patients, even with open surgery and suprarenal clumping, carry extremely high mortality.¹⁰

One of the most important developments in the diagnosis and treatment of AAA, open or endovascular in my opinion is the evolution of spiral computed tomography and the widespread use of CT angiography. I would consider a necessary step the 15 min. delay of the procedure in order to have a detailed anatomical picture of the aneurysm, the proximal neck and the iliac arteries. Having in mind the above information the vascular surgeon can perform the operation quicker and safer, whether he is planning open or “endo” approach. Even more with today's technology, CT scan images, can be sent online from a peripheral district hospital during patient transfer from another hospital in order to evaluate the aneurysm, plan the operation and organize delivery of the necessary endografts and other necessary equipment in case there are no available in OR storage. Mean time from rupture to death is almost 12 hours, so some extra minutes are not decisive in the vast majority of cases.¹¹ On the other hand though the interval from rupture to diagnosis, to treatment, which can take several hours is extremely important for the survival and care must be taken to provide quick diagnosis and transportation within an organized health care system.

As described from the authors, hypotensive resuscitation, in combination with coagulation control could be important preoperative medical support steps in order to reduce blood loss until the operation is carried out. Even more, graft evolution with newer generation low profile grafts and controlled suprarenal fixation are contributing today to higher operative success rates.

Finally as described according to the experience of the vascular surgeon proper use of local anesthesia, percutaneous approach, graft selection (Bifurcated/ Aorto-uniiliac) and balloon occlusion bleeding control are technique developments that can improve the results, but have to be evaluated thoroughly in the future. Another important factor which should

Author for correspondence:

Prof. Konstantinos Papazoglou

E-mail: kpapas@auth.gr

ISSN 1106-7237/ 2019 Hellenic Society of Vascular and Endovascular Surgery Published by Rotonda Publications
All rights reserved. <https://www.heljves.com>

be taken into consideration, in applying EVAR in RAAA, is the abdominal compartment syndrome which carries very high mortality. Again, early diagnosis, quick transfer and proper management of the patient, has to be included in the treatment protocol.

Concluding, it seems that endovascular RAAA treatment offers a unique opportunity to improve the results in this critical and urgent medical condition but in order for these results to widely appear, new trials incorporating the newer developments and experience on the field are needed and at the same time, establishment of a treatment algorithm in every vascular center is required.

REFERENCES

- 1 Matsagkas M, Kouvelos G, Spanos K, Bouzia A, Arnaoutoglou E, Giannoukas A. Ruptured abdominal aortic aneurysm repair: introducing a step by step protocol. *HJVES* 2019;2: 55-58
- 2 Papazoglou K, Mallios A, Rafati F, Zambas N, Karkos C. Endovascular treatment of ruptured abdominal aortic aneurysms with the Endurant device. *Ann Vasc Surg* 2013;27: 162-167
- 3 IMPROVE trial investigators, Powell JT, Sweeting MJ, Thompson MM, Asleigh R, Bell R, et.al. Endovascular or open repair strategy for ruptured abdominal aortic aneurysm: 30 days outcome of IMPROVE randomised trial *BMJ* 2014; 348:f7661
- 4 Reimerink JJ, Hoornweg LL, Vahl AC, Wisselink W, van den Brock TA, Legemate DA et al. Endovascular repair versus open repair of ruptured abdominal aortic aneurysms: a multicenter randomized controlled trial . *Ann Surg* 2013; 258: 248-256
- 5 Desgranges P, Kobeiter H, Katsabian S, Boufi M, Gouny P, Favre J-P et al. ECAR (Endovasculaire Chirurgie dans les Aneurysmes aorto-iliaques Rompus): a French randomized controlled trial of endovascular vs. open surgical repair of ruptured aorto-iliac aneurysms. *Eur J Vasc Endovasc Surg* 2015; 50: 303-310
- 6 Van Beek SC, Conjin AP, Koelemay MJ, Balm R. Endovascular aneurysm repair versus open repair for patients with a ruptured abdominal aortic aneurysm: A systematic review and meta-analysis of short-term survival. *Eur J Vasc Endovasc Surg* 2014; 47: 593 -602
- 7 Anjum A, von Allmen R, Greenhalgh R, Powell JT. Explaining the decrease in mortality from abdominal aortic aneurysm rupture. *Br J Surg* 2012; 99:637-45
- 8 Mayer D, Aeschbacher S, Pfammatter T, Veith FJ, Norgren L, et al. Complete replacement of open repair for ruptured abdominal aortic aneurysms by endovascular aneurysm repair: a two center 14-year experience. *Ann Surg* 2012; 256: 688-695
- 9 Karthikesalingam A, Wanhainen A, Holt PJ, Vidal-Diez A, Brownrigg JRW, et al. Comparison of long-term mortality after ruptured abdominal aortic aneurysm in England and Sweden. *BJS* 2016; 103: 199-206
- 10 Veith FJ, Lachat M, Mayer D, Malina M, Holst J, et al. Collected world and single center experience with endovascular treatment of ruptured abdominal aortic aneurysms. *Ann Surg* 2009; 250: 818-824
- 11 Chaikof EL, Blankensteijn JD, Harris PL, White GH, Zarins CK, et al. Reporting standards for endovascular aneurysm repair. *J VascSurg* 2002; 35: 1048-1060.