THE SOCIETY FOR VASCULAR TECHNOLOGY OF GREAT BRITAIN AND IRELAND

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Paper: Spring 2022 CPD Questions

Personal Reflection:

Information and points of revision ~ I took from these studies~:

Paper 1 - Post-operative Surveillance and Long Term Outcome after Endovascular Aortic Aneurysm Repair in Patients with an Initial Postoperative Computed Tomography Angiogram Without Abnormalities: the Multicentre Retrospective ODYSSEUS Study ACM Geraedts et al
Long term results of previous clinical trials reveal equal overall survival rates between open repair and EVAR, but significantly more secondary interventions in patients treated by EVAR.
Due to a continued risk of endograft related complications and rupture following EVAR, strict imaging surveillance is considered mandatory for all patients, and recommended by current international guidelines8,9 and endograft manufacturer‚Äôs instructions for use
Previous research has not demonstrated any beneficial effect on survival when comparing patients with continued and discontinued imaging surveillance; however, increased secondary intervention rates were observed in patients with continued follow up.
Abnormal radiological findings during follow up were recorded as follows: type I e IV endoleak, endograft migration > 10 mm, endograft infection, endograft kinking, limb occlusion, or sac growth (anteroposterior [AP] diameter).
Sac growth and shrinkage were determined as an increase or decrease of > 5 mm between two consecutive imaging studies, or if there was > 5 mm growth or shrinkage in comparison with the initial post-operative AAA diameter. The aneurysm diameter was recorded as stable if less than 5 mm sac growth or shrinkage occurred.
The commonest abnormal radiological findings in patients with continued follow up were sac growth and type II endoleak.
There was no difference in the number of secondary interventions between patients with continued and discontinued imaging follow up. However, secondary interventions were seen earlier in the group with continued post-EVAR surveillance.
The value of the initial post-operative imaging has been investigated before, demonstrating the risk of complications and interventions is low if no abnormalities are shown on initial imaging.
The study showed that 73.0% of patients survived more than five years after EVAR, while 45.6% survived more than 10 years after EVAR, equivalent to another long term study.23
Paper 2 - EVAR Follow-Up with Ultrasound Superb Microvascular Imaging (SMI) Compared to CEUS and CT Angiography for Detection of Type II Endoleak Marco Curti et al
Endovascular abdominal aortic aneurysm repair (EVAR) is complicated by an endoleak‚Äîdefined as the persistence of a vascular communication between the systemic circulation and the aneurysmal sac‚Äîin approximately 45% of cases.
In January 2014, a new imaging technology was developed by Toshiba, called superb microvascular imaging (SMI). This technology allows the purification of the Doppler signal, eliminating noise and background artifacts, without reducing the vascular signal. These features overcome the limitations of traditional color Doppler ultrasound in detecting microvascular blood flows [18]. SMI also filters the signal originating from tissue movement,

enabling selection and analysis of low-velocity blood flows. Consequently, both high-speed and low-speed flows are also well represented within small vessels with SMI technology, which provides high image resolution with an elevated frame rate (>50 fps) [18]. SMI can be displayed in two different modes, i.e., color SMI and monochrome SMI. The color SMI mode shows conventional grayscale ultrasound B-mode with superimposed color Doppler signals on the same image. Conversely, the monochromatic mode displays only vascular structure information which is amplified by eliminating background signals [18]. As compared with the traditional color Doppler ultrasound (CDUS), monochromatic SMI is more sensitive to slower blood flow, reproducing images which are similar to those obtained by CEUS, without the use of intravenous contrast media.

In type I and III endoleaks, prompt reoperation is recommended because they are high-flow alterations with an elevated risk of rupture. Type II endoleaks are the most frequent, due to a retrograde blood flow to the sac coming from collateral branches (e.g., lumbar or inferior mesenteric artery).

CEUS is burdened by the need of a highly experienced operator and expensive contrast agents.

‚ÄúSuperb microvascular imaging‚Äù was introduced by Toshiba; SMI generates images similar to those obtained with CEUS without intravenous contrast injection.

The limits of the SMI algorithm are the same as for CEUS and general ultrasound: it is hindered by intestinal gas, high body mass index, and eventual postsurgical subcutaneous emphysema. Finally, SMI does not give a quantitative assessment but only a qualitative one; indeed, it can only identify the presence of an endoleak but does not provide information about flow direction