

How do we best investigate a suspected graft infection?

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Disclosure

Speaker name:

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Consulting

I do not have any potential conflict of interest



Aortic stent graft infection

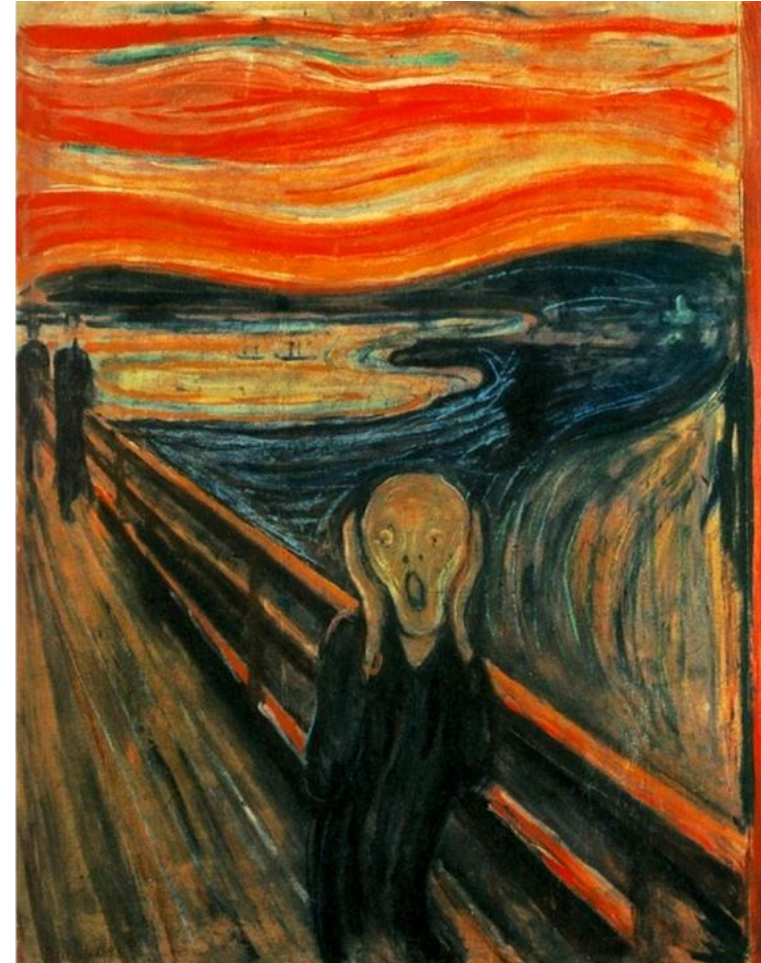
- Rare event – reported incidence 0.5-4%
- Pretty disastrous all round
- Presents in variety of ways
- Often very subtle
- Requires index of suspicion, which can be lacking
- Implications of diagnosis are massive
- Reluctant diagnosis



Need to be certain

Breaking bad news

- Patient and family – is it bad Doc? (Absolutely)
- Medical team – what are we going to do? (We don't know)
- Is it the beginning of the end? (Probably)



Diagnosis of Aortic Graft Infection: A Case Definition by the Management of Aortic Graft Infection Collaboration (MAGIC)

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WHAT THIS PAPER ADDS

There is no universally accepted aortic graft infection case definition and clinical approaches to this complex condition differ widely with variable outcomes. Here, the Management of Aortic Graft Infection Collaboration (MAGIC), involving clinicians from several English hospital National Health Service Trusts with large vascular services, propose a formal case definition, derived by a process of multidisciplinary, expert consensus. The definition is readily applied in routine practice and aids early recognition. Importantly and towards development of evidence-based clinical guidelines that are presently lacking, it provides a consistent diagnostic standard, essential for clinical trial design and meaningful comparison between diagnostic and therapeutic strategies.

Objective/Background: The management of aortic graft infection (AGI) is highly complex and in the absence of a universally accepted case definition and evidence-based guidelines, clinical approaches and outcomes vary widely. The objective was to define precise criteria for diagnosing AGI.

Methods: A process of expert review and consensus, involving formal collaboration between vascular surgeons, infection specialists, and radiologists from several English National Health Service hospital Trusts with large vascular services (Management of Aortic Graft Infection Collaboration [MAGIC]), produced the definition.

Results: Diagnostic criteria from three categories were classified as *major* or *minor*. It is proposed that AGI should be suspected if a single *major* criterion or two or more *minor* criteria from different categories are present. AGI is diagnosed if there is one *major* plus any criterion (*major* or *minor*) from another category. (i) Clinical/surgical *major* criteria comprise intraoperative identification of pus around a graft and situations where direct communication between the prosthesis and a nonsterile site exists, including fistulae, exposed grafts in open wounds, and deployment of an endovascular stent-graft into an infected field (e.g., mycotic aneurysm); *minor* criteria are localized AGI features or fever $\geq 38^{\circ}\text{C}$, where AGI is the most likely cause. (ii) Radiological *major* criteria comprise increasing perigraft gas volume on serial computed tomography (CT) imaging or perigraft gas or fluid (≥ 7 weeks and ≥ 3 months, respectively) postimplantation; *minor* criteria include other CT features or evidence from alternative imaging techniques. (iii) Laboratory *major* criteria comprise isolation of microorganisms from percutaneous aspirates of perigraft fluid, explanted grafts, and other intraoperative specimens; *minor* criteria are positive blood cultures or elevated inflammatory indices with no alternative source.

Management of Aortic Graft Infection Collaboration (MAGIC)

- Established in UK 2013
- Vascular surgeons, ID physicians, microbiologists & radiologists
- AGI – open surgical as well as EVAR
- Expert consensus
- Systematic literature review
- Modified Delphi method
- Potential diagnostic criteria considered
- Retained criteria ranked as Major or Minor



Diagnostic criteria

- Divided into 3 categories
- Clinical/Surgical - Radiology - Laboratory
- Ranked as Major or Minor in each category
- AGI ***suspected*** if any Major criterion positive, **or** Minor criteria from 2 out of 3 categories
- AGI ***diagnosed*** in presence of single Major criterion **plus** any other criterion from another category – Major or Minor



Clinical/surgical criteria

Major

- Pus (confirmed by microsc) around graft or in aneurysm at time of surgery
- Open wound with exposed graft or communicating sinus
- Fistula development –eg aortoenteric
- Graft insertion in already infected site eg fistula

Minor

- Localised features of AGI – warmth, erythema, swelling, purulent discharge, pain
- Fever >38C with AGI as most likely cause



Radiology criteria

Major

- Perigraft fluid on CT >3 months after insertion
- Perigraft gas on CT >7 weeks after insertion
- Increase in perigraft gas volume demonstrated on serial imaging

Minor

- Other suspicious features such as perigraft gas/fluid/soft tissue inflammation; false aneurysm formation; adjacent bowel wall thickening; lumbar discitis/osteomyelitis; positive WCC scan; positive PET CT



Laboratory criteria

Major

- Organisms recovered from an explanted graft
- Organisms recovered from an intraoperative specimen
- Organisms recovered from percutaneous guided aspirate of perigraft fluid

Minor

- Positive blood culture and no apparent source except AGI
- Elevated inflammatory markers (CRP, ESR etc) with AGI as most likely cause



Why is this important?

- Practical, readily applied
- Aids earlier diagnosis
- Consistent standard
- Aids comparison of subsequent management strategies
- (Unusually good outcome – was it really infected?)



What happens in the real world?

- Non-specifically unwell
- Present to other specialities – Gen Med, ID
- Fever +/- bacteraemia
- Already on broadspectrum antibiotics
- CT scan, possible AGI – refer to vascular
- Consider other investigations – PET CT
- (vertebral bone biopsy/culture)
- Devise management plan



What happens in the real world

Major

- Fistula development or insertion in infected site
- Perigraft fluid/gas on CT when it shouldn't be there
- (Organisms recovered from percutaneous guided aspirate)

Minor

- Fever >38C with AGI as most likely cause
- Other suspicious radiology – PET CT
- Blood culture positive with AGI most likely source



Summary

- MAGIC criteria helpful
- Emphasise importance of diagnostic certainty
- Aim to get positive bacteriology
- Aids comparison of management strategies



Save the date
Critical Issues May 23-24th 2019
Liverpool, UK

