Long-term durability of bridging stents:
The scope of the problem and potential solutions

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Disclosure

Speaker name:

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I have the following potential conflicts of interest to report:

- ☐ Consulting
- ☐ Employment in industry
- ☐ Stockholder of a healthcare company
- ☐ Owner of a healthcare company
- ☐ Other(s)

- ☒ I do not have any potential conflict of interest

Bridging stent grafts

- **Definition:**

  Connection stent graft between target vessel and aortic graft during fEVAR/bEVAR/IBD

- **Options**
  - **S-EXP**: Self-expandable (e.g. Gore Viabahn ®)
  - **B-EXP**: Balloon-expandable (e.g. Bentley Begraft+®, Gore Viabahn ® VBX, Advanta V12) → mostly used in literature – largest data collection


Getinge V12®


Gore Viabahn ®

Gore Viabahn ® VBX

Bentley BeGraft + ®

Topics

- Choice of bridging stent type (S-EXP, B-EXP)

- Long term durability (fatigue due to respiratory movement, change in stent graft configuration / aneurysma morphology)

- Other complications (branch related endoleaks, stent migration, angulation, branch occlusion, branch stenosis,) and reintervention rates?

Results literature research

Stent type choice:

- Common procedure:
  - B-EXP covered stent graft = first connection of the target vessel
  - S-EXP stent = additional angle equalization / branch elongation

- Choice of (B-EXP) **stent option** seem to have **no impact** on branch **durabilty** (Farivar et al. 2021)
- Comparing different B-EXP stent grafts (VBX vs. Advanta V12) shows **no significant difference** in freedom of fracture after **fatigue tests** (Torsello et al. 2021)
- Adjunctive visceral procedures have also no impact on branch durabilty (Pini et al. 2020)

Results literature research

Complications (Mezetto et al. 2021) → Systematic Review
19 studies, n=2.796, 9.556 TV

- Median rate of postoprative complication 28 %
- Bridging stent instability (fractures, dislodgements, stenosis, and occlusions) **4 %**

  → Renal target vessels have a higher rate of stenosis and occlusion compared to visceral vessels
- Branch migration → potential occlusion of SMA or LRA and/or → potential aneurysm growth
- Reinterventionsrate: 3 %
- Freedom of reinterventions: 12 months 88 %, 24 months 86 %, 36 months 69 %

Results literature research

- **Configuration** of bridging stents and aortic aneurysm **change over time** (de Niet et al. 2019)
  - Potential reasons:
    - Change in thrombus-blood ratio (due to change in density of the aneurysm thrombus)
    - Change in aortic aneurysm wall morphology
    - Repetitive movement (e.g. respiratory mechanics)
    - Change in aneurysm size (shrinking) → aneurysm and aortic remodeling
    - Stent sliding

→ more likely cause of stenosis, occlusion or endoleaks (EL)

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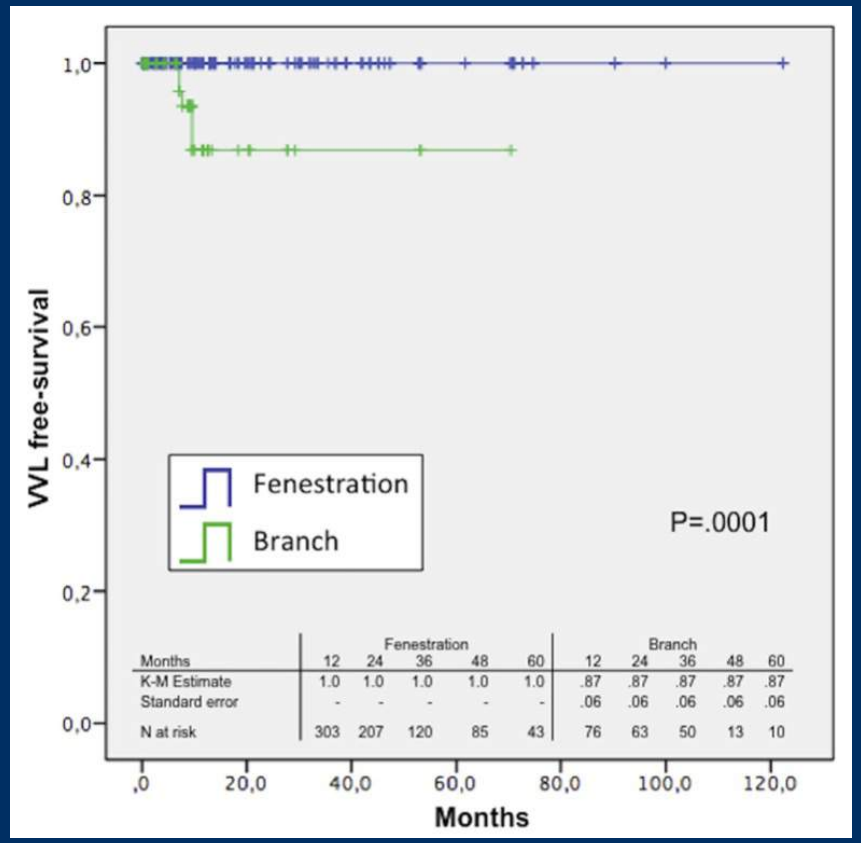
Conclusion

- The type of bridiging stent graft seems to have no significant impact on the stent graft durability

- Complication such as change of branch angulation and migration increase due to stent graft configuration or aneurysma morphology increase the risk of target vessel stenosis and occlusion

- Branches (bEVAR) are more vulnerable than fenestrations (fEVAR) to complication, mostly due to more complex aneurysm anatomy



(Pini et al. 2020
Kaplan Meier)

Ungoing problems

- Choice between branches and/or fenestrations stays an investigator dependent and anatomy based decision without general guidelines
- Over all low rate of detailed data on complications after bridging stents (Mezetto et al. 2021)

- More long-term follow-up data needed for prediction of future bridging stent-graft instabilty (Fazzini et al. 2021)

- Selection bias due to bEVAR often used in more complex anatomy (aortic lumen > 25 mm) and emergency situations (Mezetto et al. 2021) → higher risc for complications

Literature

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