Massive bleeding through tracheostomy site controlled by double and parallel covered stent insertion

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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)

- [x] I do not have any potential conflict of interest
CLINICAL PRESENTATION

- Female, 63 y.o.

- Rare malignant thyroid cancer

- Chronic, definitive tracheostomy

- Interned due to pulmonary infection

- Sudden massive bleeding through TO site → cardiac arrest
- Prompt resuscitation;

- Blood removed from lungs by aspiration;

- Intubation through tracheostomy site;

- Control of bleeding by direct compression of bleeding site (a finger inside the tracheostomy)

- Moved to surgical room + C arm
- Diagnostic angiogram (finger still controlling bleeding site)
- Right brachial access (exposure):
  - 11x100mm heparin-bonded Viabahn
  Subclavian artery → brachiocephalic trunk.

- Left femoral access (puncture):
  - 10x100mm heparin-bonded Viabahn
  Brachiocephalic trunk → right common carotid artery.
- Estimated diameter of the BCT: 15mm (indirect measure using a marked pig tail)

Calculating the to-be-covered area: $\pi r^2$

- BCT inner area: 176 mm$^2$
- Viabahn 11mm outer area: 103 mm$^2$
- Viabahn 10mm outer area: 86 mm$^2$
- Total stent area: 189 mm$^2$ (7% larger)
INTERVENTION

- Immediate result: bleeding ceased, quick flow to right CCA and subclavian artery
- As expected, BCT and stents were exposed to the environment;
- Patient was very unstable, unsuitable for further procedures at that time.
- After seven days, a surgical skin flap was performed to reconstruct the tracheostomy inferior wall and cover the artery.
Tracheostomy inferior wall rebuilding – covering the BCT

- Tracheal tube
- Flap (skin in yellow; subcutaneous fat in red)
- Brachiocephalic trunk and stents
- Day 14: patient unstable due to septic shock;

- Day 16: persistent hypotension → Obstruction of the CCA stent

- Massive stroke;
- Death after 20 days.
CONCLUSIONS

- In the end, we could not help our patient;

- Perhaps this experience can help others;

- Lessons: how to avoid suppression of one stent by the other?
  - Balloon-expandable stents in their proximal orifice?
  - Changing the total combined area of stents?
  - IVUS would certainly help a lot.
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