Technique for Delivery of Branched Grafts During Chimney or Juxta-renal Aortic Procedures

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LINC 2018
Disclosure

Speaker name: Andrew Holden.

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 – Clinical Investigator

☒ I do not have any potential conflict of interest
There is nothing new under the sun, but there is something old we do not know.

Ecclesiastes 1:9 – written by Solomon in his old age....
Compliant Balloons in Aortic Intervention

- Since the early EVAR days, compliant aortic balloons have been used for endograft “moulding” to improved apposition to the vessel wall and prevent or treat endoleaks\(^1\)
- More recently, these devices have been used to provide hemodynamic control during EVAR for rAAA\(^2\)
- Compliant aortic balloons are also extensively used to provide hemostasis in other clinical situations, including trauma – resuscitative endovascular balloon occlusion of the aorta (REBOA)\(^3\)

1. Int Angiol. 2011;30(5):467-73
Compliant Balloons in Aortic Intervention

- Recently aortic compliant balloons have become available in lower profiles
- This provides opportunity for more regular use of these devices

Cook CODA X 120cm
9F sheath compatible

Medtronic RELIANT X 120cm
12F sheath compatible
Compliant Balloons in Aortic Intervention

Balloon-Supported Passage of a Stent-Graft into the Aortic Arch

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Aortic Branch Entry During EVAR Procedures

- Cannulation of aortic branch arteries may be difficult or unstable, especially when stiffer guidewires, sheaths or stents are delivered

- **Compliant Balloon Assisted Branch Entry (C-BABE)** is the use of a compliant aortic balloon to facilitate aortic branch artery intervention
Compliant Balloon Assisted Branch Entry (C-BABE)

- Key components:
  - Compliant balloon
  - Long supportive sheath to prevent balloon displacement

- Balloon provides resistance to prevent catheter prolapse

- C-BABE may be performed with the balloon proximal or distal to the aortic branch
Alternatives to C-BABE – Steerable Catheters

- Multiple steerable, guide catheters and guide sheaths are available
- OSCOR Destino Bi-directional Steerable Guiding Sheath (6.5 - 13.5 F)
Alternatives to C-BABE – Steerable Catheters

- MERIT Swift Ninja Steerable Microcatheter
Limitations of Steerable Catheters

- Steerable guides are very useful but have limitations when compared to Balloon Assisted Branch Entry.
- Cost
- Profile (especially for upper limb access)
- Length
- Need to be large enough to not only support guidewire passage but also sheaths, stents etc.
C-BABE with Occlusion Balloon Distal

- Used to facilitate aortic branch entry from above
- Particularly useful in chimney procedures (ChEVAR and ChEVAS)
C-BABE with Occlusion Balloon Distal

- 76 year old male with 56mm AAA
- Offset renal arteries with hostile neck below lowermost LRA and LRAS
- For single vessel ChEVAS – stent LRA
C-BABE with Occlusion Balloon Distal

- Unsuccessful attempts to deliver a catheter into LRA from above
- Left renal artery cannulated from below with placement of a "buddy" wire
- Attempts to catheterize from above still unsuccessful!
C-BABE with Occlusion Balloon Distal

- LRA then stented from below and buddy wire left in place
- C-BABE performed to facilitate delivery of catheter, sheath and covered balloon expandable stent (Viabhan BX)
C-BABE with Occlusion Balloon Distal

- Procedure then completed successfully
C-BABE with Occlusion Balloon Distal

- 78 year old male, EVAR 4 years ago (Medtronic Endurant)
- Late T1AEL secondary to device migration
C-BABE with Occlusion Balloon Distal

- 2 vessel ChEVAS planned
C-BABE with Occlusion Balloon Distal
C-BABE with Occlusion Balloon Distal
CT 1 month
C-BABE with Occlusion Balloon Proximal

- Used to facilitate aortic branch entry from below
- This concept has been used during FEVAR for many years via a constrained endograft


Auckland Hospital Case
C-BABE with Occlusion Balloon Proximal

- A compliant aortic balloon proximal to the fenestrations can also be used to facilitate cannulation
- However, this concept can also be applied to cannulating other branches below a compliant balloon during aortic interventions
- We have used this technique in a number of applications:
  - Contralateral gate cannulation
  - Inferior mesenteric artery cannulation
  - Hypogastric artery cannulation
C-BABE with Occlusion Balloon Proximal

- Elective EVAR
- Unable to cannulated contralateral gate from below as compressed against aneurysm wall
- Could not access from above as previous thoracic aortic surgery
- Repeated attempts to cannulate from the opposite groin resulted in catheter prolapse
C-BABE with Occlusion Balloon Proximal

- Compliant balloon in endograft above bifurcation allowed delivery of the guidewire without catheter prolapse.
C-BABE with Occlusion Balloon Proximal

- Guidewire snared and procedure completed
C-BABE with Occlusion Balloon Proximal

- Parallel graft (periscope) for IMA
- Could not advance a catheter into the IMA
C-BABE with Occlusion Balloon Proximal

- Type 1B EL 2 years after EVAR
C-BABE with Occlusion Balloon Proximal

- Planned LIIA embolization and endograft extension into EIA
- Unable to deliver sheath into IIA to plug occlude it from ipsilateral groin approach – C-BABE assisted this
C-BABE with Occlusion Balloon Proximal
C-BABE with Occlusion Balloon Proximal
Compliant Balloon Assisted Branch Entry (C-BABE)

- The use of an aortic compliant balloon to facilitate arterial branch cannulation
- Balloon used dynamically during intervention – temporarily inflated during branch entry
- Longitudinal positioning of the balloon important to optimize effect
- Multiple applications – important adjunctive technique for many procedures
- Reduced profile of new compliant balloons and associated long supportive sheaths increase utility
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