How to shorten guiding catheter

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☑️ I do not have any potential conflict of interest
How many percent of you have ever notified the length of guiding catheter...

...balloon and stent catheter?
Standard Lengths in CVL

- Standard guiding catheter: \( \approx 100\text{cm} \)
- Mother-n-Child guiding catheter (ST 5F) \( 120\text{cm} \)
- Y-connector \( \approx 6-10\text{ cm} \)
- Balloon catheter (PTCA) \( \approx 135-145\text{ cm} \)
- Stent catheter (PTCA) \( \approx 140-145\text{ cm} \)

So, in common setting, the effective/usable length of PTCA catheters are \( \leq 130\text{cm} \) and the longest stentable distance is \( 25-30\text{ cm} \) from LCA/RCA ostium.
Usual PTCA/stent catheter

- Catheter for Boston’s stent (Promus) 140++ cm
- Catheter for Terumo stent 145 cm
- Catheter for Boston’s stent 144 cm
- Catheter for BioSensor’s stent 142 cm
- Catheter for Sorin’s stent 142 cm
- Catheter for Cordis’s stent 140 cm
- Catheter for Medtronic’s stent 140 cm
- Catheter for Biotronic’s stent 140 cm
- Catheter for BBraun’s stent 138 cm
- Catheter for Abbott’s stent unknown
What should we do if we need to PTCA further down?
Solution for stenting far...

1. Deep seat the guiding catheter in the coronary or use the modified mother-n-child technique
2. Longer balloon catheter (145-150 cm)
3. Specially manufactured shorter guiding catheters
4. Shortening of the existing guiding catheter

but when the guidewire is in situ?...
...or lack of guiding catheter with concordant length?
CTO Proximal RCA > 10 yrs
Collateral from LCA to mRCA

Courtesy by Dr. Soo-Teik Lim, NHCS
Severe diffuse stenosis of dLAD, no LM entry, blood supply by LIMA.

PCI performed to native LAD stenosis via tortuous LIMA.
Modified Mother-Child system

So, the effective/usable length of PTCA catheters are $\leq 130\,\text{cm}$ and the longest stentable distance is $25-30\,\text{cm}$ from the ostium.
Indications for GC shortening

- Mismatch in GC length to PTCA catheter:
  1. Most likely encountered with long SVG or LIMA to treat the target lesions in the native vessels.
  2. Retrograde approach for CTO PCI
  3. Modified mother-and-child technique for better support

- Temporary out-of-stock of GC with suitable length
Solution for GC shortening

1. Exchange for another shorter guiding catheter

2. Use the same initial guiding catheter
   1. Replace Y-connector with the hemostasis valve of another smaller sheath.
   2. Use another small sheath to connect both shortened parts of initial guiding catheter: need Y connector.
   3. Use the hub of the initial guiding catheter to connect with shortened part of initial GC: need Y connector.
Equipment required

1. Standard sheath that is one French size smaller than the guide catheter in place (e.g. 6Fr. Sheath if 7Fr guide catheter is used).

2. Dilators the size of guiding catheter and sheath or a forceps.

3. Initial guiding catheter (GC) itself.
Prepare proximal part

1. Clamp firmly the GC distally at desired reduction length. Cut the GC with a sharp scalpel or scissor proximally to the clamp. If the guidewire is in situ, be careful not to damage the in-dwelling guidewire (or it can be protected by steel tube like an introducer)…

Desired reduction length

Use sharp scalpel or scissor
Prepare proximal part

1. Remove the GC hub and hemostatic valve from the guidewire. Prevent bleeding from remaining GC by a firm clamp or by inflation a small balloon inside the remaining guiding catheter.

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Remove the GC hub & valve

Inflate a small balloon to prevent bleeding

Use sharp scalpel or scissors
2 Cut 1F-smaller sheath to have a 2cm sheath length connected to arm sheath and valve (1st option) or free end tub (2nd option). Flare slowly the free end (for 1st option) or both ends (2nd option) with 1F-bigger dilator or forceps... 3rd option is to use the original hub.
Prepare distal part

2. Cut 1F-smaller sheath to have a 2cm sheath length connected to arm sheath and valve (1st option) or free end tub (2nd option). Flare slowly the free end (for 1st option) or both ends (2nd option) with 1F-bigger dilator or forceps... 3rd option is to use the original hub.
Reconnect both parts

Both parts are threaded over the in-dwelling guidewire with in-situ dilator. The flared end is advanced over the remaining GC with a firm friction fit. Connect the arm sheath (1st opt.) or Y connector (2nd & 3rd opt.) to the manifold and remove all air before use.
Potential Risks & Advantages

Advantages: Shortening the guide catheter while maintaining both GC and guide wire positions.

Potential Risks:

1. Cut off the guidewire when preparing the proximal part
2. Air embolism after reconnecting due to damaged sheath valve (guidewire), 3rd methods, advancing devices...
3. Damage balloon/stent due obstruction from GC cut end
Take-home Message

- Guiding catheter shortening is feasible and rather simple technique even with a guidewire in-situ.
- Guiding catheter shortening can be useful for very far lesions of native vessels through bypass or retrograde approach in CTO or for temporary situation of lack of suitable GC.
References


Thank you very much for your attention!