Fate of Classic Bare Metal Stents Placed in Popliteal Arterial P2 & P3 Segments in Asian Patients

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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
Introduction

• Classic nitinol bare metal stent (CN-BMS) has been widely applied in femoropopliteal stenocclusive lesions despite emerging new techniques such as DCB, DES, Atherectomy etc...

• Stent fracture after deployment of CN-BMS has been recognized as an adverse events in the femoropopliteal artery and this can be considered a risk factor for in-stent restenosis and reocclusion in FP arterial stenting.

• Although the factors influencing FP arterial stent fracture have not been fully elucidated, it is believed to occur by external compression by muscle activity, by overlapping long stents, or by mechanical stress at articulation sites.
Introduction

• In some operators, popliteal arterial P2 and P3 segments used to be avoided for CN-BMS placement due to the articulation sites where it could easily be bent. However, it is inevitable that a stent was placed in the popliteal arterial P2 and P3 segments in the case of critical limb ischemia or for bail-out after balloon angioplasty.

• Unfortunately, there has been little data regarding the status of stents placed in the P2 and P3 segments and especially in Asian patients in which full flexion of the knee joints is often necessary in order to perform routine activities such as kneeling, squatting and sitting with both legs crossed.
Purpose

• The purpose of this study is to evaluate the primary patency and morphological status of classic nitinol self-expandable stents in the popliteal arteries, especially the P2 and P3 segments in Asian patients.
Materials and Methods

• From July 2006 to March 2012
• CT angiography and ABI → Rutherford category 2~6
• Retrospective review the medical and radiological records
• Total 189 patients who underwent endovascular treatment for popliteal stenoocclusive lesions, including popliteal arterial P2 and P3 segments
• CN-BMS placement was performed in popliteal arterial P2 and P3 segments primarily or bail-out in patients with unsuccessful primary balloon angioplasty
Materials and Methods

- CN self-expandable BMS (SMART: Cordis)
- Stent fractures was defined as clear interruption of stent struts identified by X-ray from at least 2 projections, with resulting kink or misalignment along axial length of the stent
- Restenosis was defined as more than 50% of the vessel diameter at treated segments in CT angiography or absence of flow or a focal increase in peak systolic velocity ration of > 2.5 in duplex ultrasound.

Results

• Technical success – 100%
• Total 18 limbs were included,
  : Bail-out stenting (n=7) - P2 (n=2), P3 over P2 (n=5)
  : Primary stenting (n=11) – P2 (n=8), P3 over P2 (n=3)
• Total fracture rate : 9/18 (50%)
• One Stent fracture (Type 2) @ 1M FU (1/18; 5.6%) : P3 over P2
• 7 fractures @ 3M FU (Type 1; n=1, Type 2; n=4, Type 3; n=1, Combined; n=1)
  : P2 (1/10; 10%), P3 over P2 (6/8, 75%)
• One fracture @ 6M FU (Type 2) : P3 over P2
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Results

• There was no more fractures @ 1y FU

• All cases that underwent stent placement until popliteal P3 segment over P2 demonstrated stent fractures, with occlusion

• Blood flow through the stent was completely occluded at the time of detection of stent fracture in all cases of type 2, 3, and 4 fractures

• In the case of type 1 fracture, stent patency was well preserved

• The group with stent implantation until P3 had higher fracture rate than the group until P2 (p<0.05)

• Overall primary patency rate – 94%, 61%, and 44% @ 1, 3, and 6 months
Results

M/66 @ 3M

M/74 @ 3M

M/87 @ 3M
Conclusion

• We suggest that self-expandable classic nitinol bare metal stent placement until popliteal arterial P3 segment over P2 segment can worsen the preservation of stent patency with high incidence of stent fracture, especially in the Asian population.

• It is hard to say that self-expandable classic nitinol bare metal stent for popliteal recanalization can be considered in the person in which full flexion of the knee joints is often necessary in order to perform routine activities such as kneeling, squatting and sitting with both legs crossed.
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