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Clinical research on the application of covered stent in the treatment of bifurcation in lower extremity arterial diseases

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Why do we tend to use covered stents in the recanalization of lower extremity arterial diseases

- Complications in open surgery
- Restenosis after PTA and PTS
- Bare stent fracture in the joint area
- The unsatisfactory effect of new devices
- There are a large number of clinical data of the covered stent



Reported patencies in the SFA

Reported Patencies of GORE® VIABAHN® Endoprosthesis / GORE® HEMOBAHN® Endoprosthesis (5–8 mm) Treating the SFA in Studies of at Least 30 Limbs

Author	Journal Publication / Presentation	Number of Limbs	Lesion Length (cm)	Percentage Occlusions	Primary Patency (Years / Percentage)			
					1	2	3	4
Lammer	Radiology. 2000;217(1):95-104.	80	13.8	NR	79			
Jahnke	JVasc Interv Radiol. 2003;14(1):41-51.	52	8.5	83	78	74	62	
Bleyn	Edizioni Minerva Medica. 2004;14:87-91.	67	14.3	100	82	73	68	54
Panetta	Endovasc Today. 2005;4(8)Supplement:12-14.	41	30.4	90	86	77		
Chopra	AIMsymposium. 2006;II 2.1.	70	20	71	93	87	72	
Coats	Endovasc Today. 2006;5(9):76-78.	83	NR	47	89			
Fischer	Endovasc Ther. 2006;13(3):281-290.	59	10.7	87	67	58	57	52
Zander	JVasc Interv Radiol. 2006;17(2)Part 2:S57.	31	16.6	NR	86	78	78	78
Saxon*	JVasc Interv Radiol. 2007;18(11):1341-1349.	87	14.2	42	76	65	60	55
Alimi	Eur J Vasc Endovasc Surg. 2008;35(3):346-352.	102	11.7	NR	74	71	71	
Djelmami-Hani	J Am Coll Cardiol. 2008;51(10)Supplement 2:B76.	132	21	39	80			
Saxon*	JVasc Interv Radiol. 2008;19(6):823-832.	97	7	21	21	65		
Ansel	Vascular InterVentional Advances (VIVA). 2009.	72	19	60	53			
Kougias	Am J Surg. 2009;198(5):645-649.	31	23	100	75			
Farraj	J Invasive Cardiol. 2009;21(6):278-281.	32	15.4	100	80			
Rabellino	Catheter Cardiovasc Interv. 2009;73(5):701-705.	32	NR	NR	82	75	75	75
McQuade	JVasc Surg. 2010;52(3):584-590.	50	25.6	NR	72	63	63	59
Average/ Total		1103	16.1	62	77	72	67	59

* Number of limbs corrected for same limbs included in both Saxon 2007 and Saxon 2008

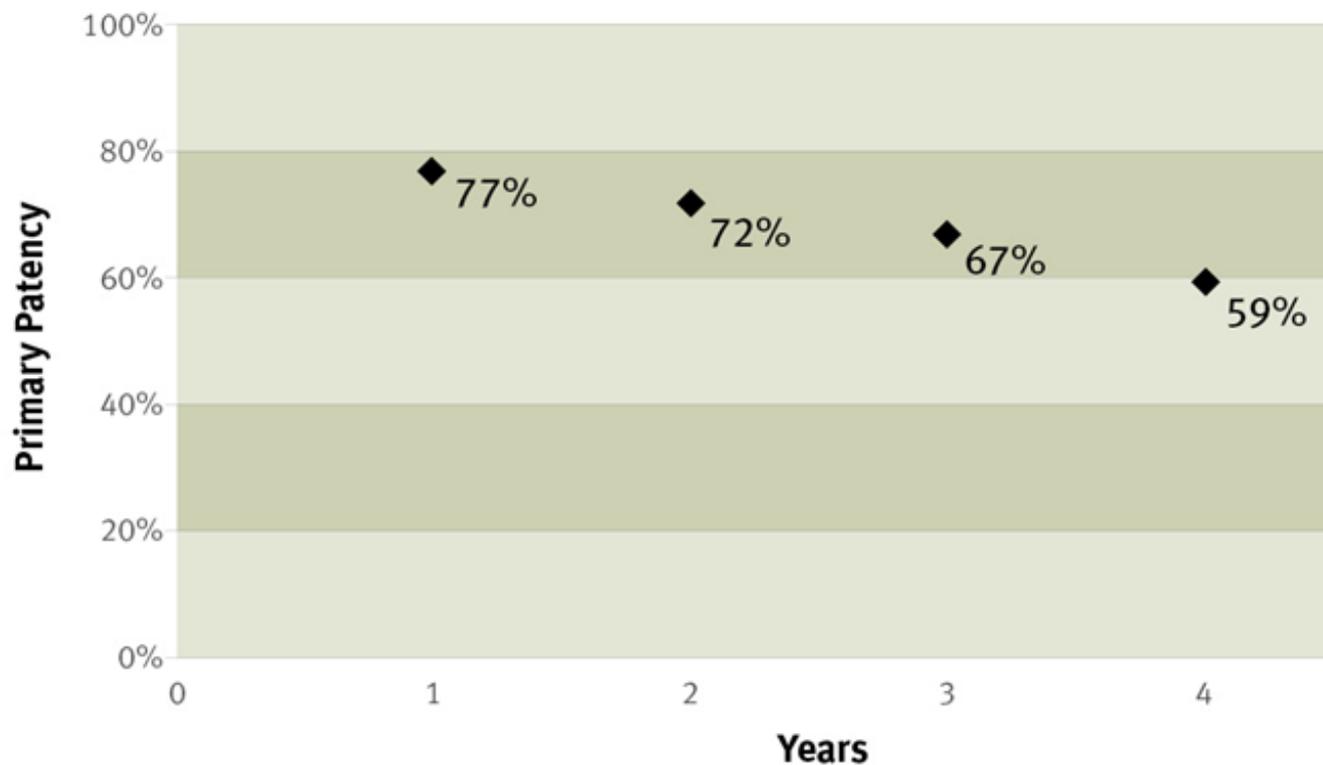
NR = Not Reported



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Long term primary patencies in the SFA

More than 1,100 Limbs in 17 Independent Studies*





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Objective

- To explore the security and the short term efficacy of covered stents in branches area lesions in lower extremity arterial diseases.



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Materials and methods

- From November 2014 to June 2015
- 16 patients (5 women and 11 men) between 59 and 81 years old (mean 71.6) were admitted
- All lesions located around the branches area of the lower extremity artery (3 cases of internal iliac artery opening, 6 cases of deep femoral artery opening, 7 cases of vascular net around the knee)。



Results

- Revascularization was technically successful in all 16 patients, ischemic symptoms relieved significantly after the operation.
- The ABI were 0.36 ± 0.12 before and 0.89 ± 0.10 after the operation.
- The patients were followed up for 3 to 9 months (median 5.5 months).
- All the patients were treated with limb salvage and no complication occurred.



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Discussion

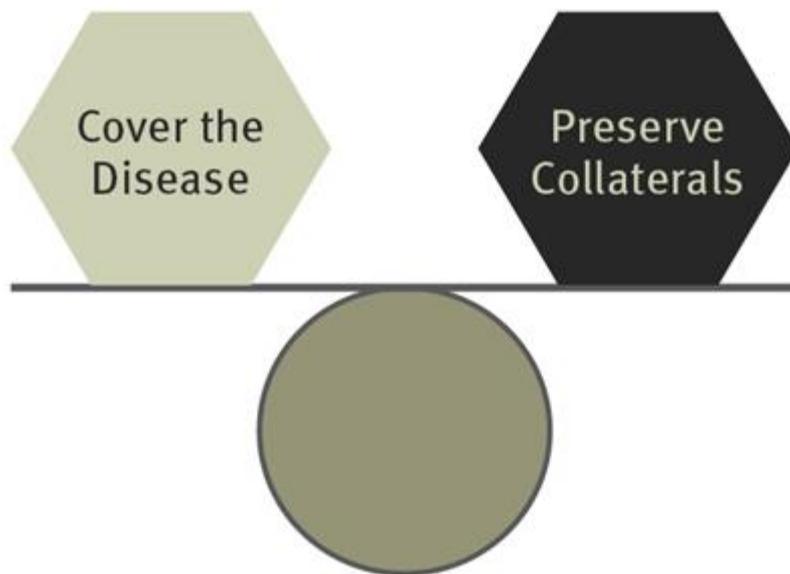
The problems need to be considered in clinical treatment using covered Stent

1. Stents size
2. the "landing zone"
3. Prevention of restenosis
4. Whether to cover the collateral circulation



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Collaterals considerations: competing interests



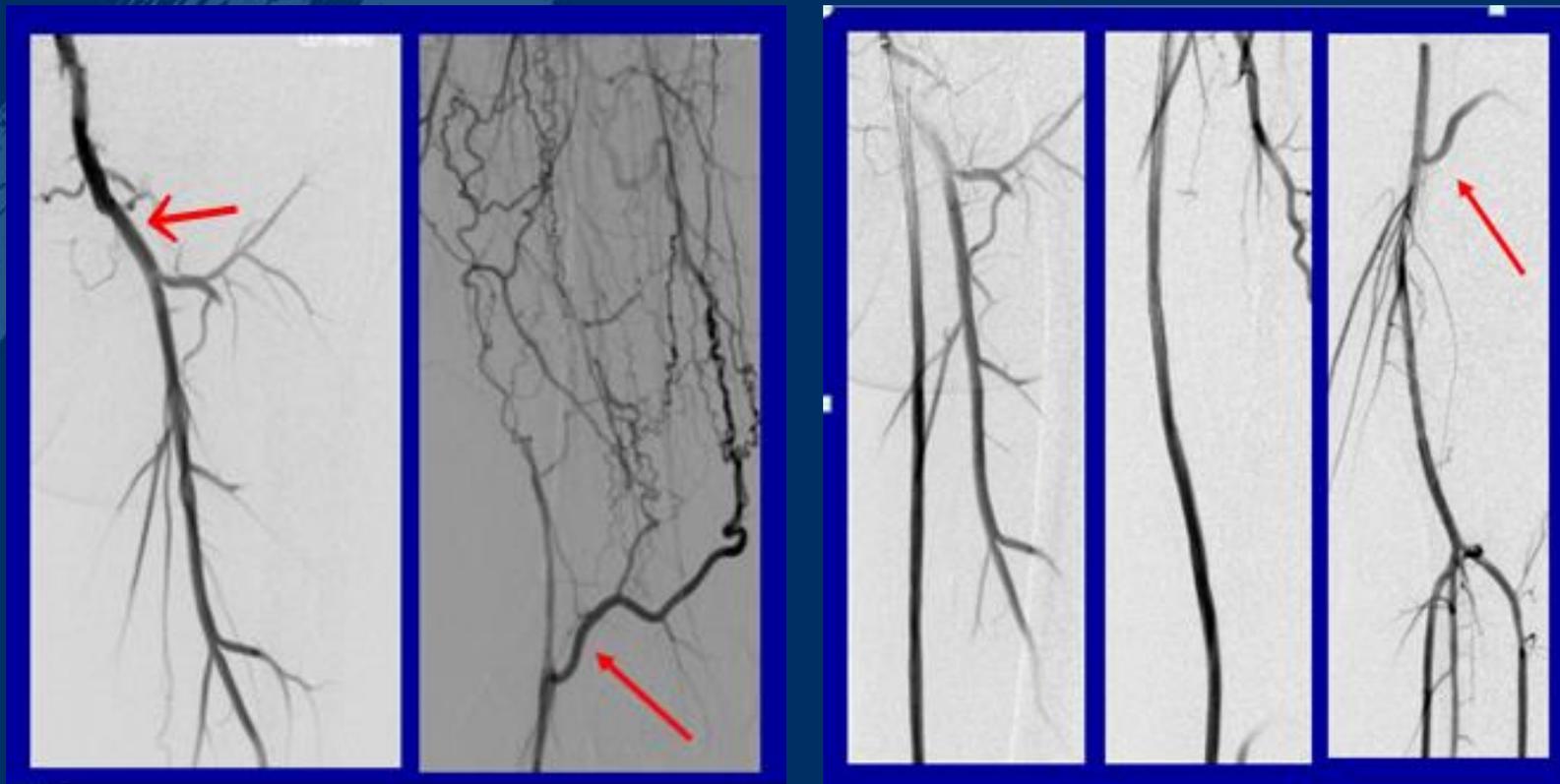
**Minimize Late
Failure**

**Prevent Conversion
to Limb Threat**



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Whether to cover the collateral circulation



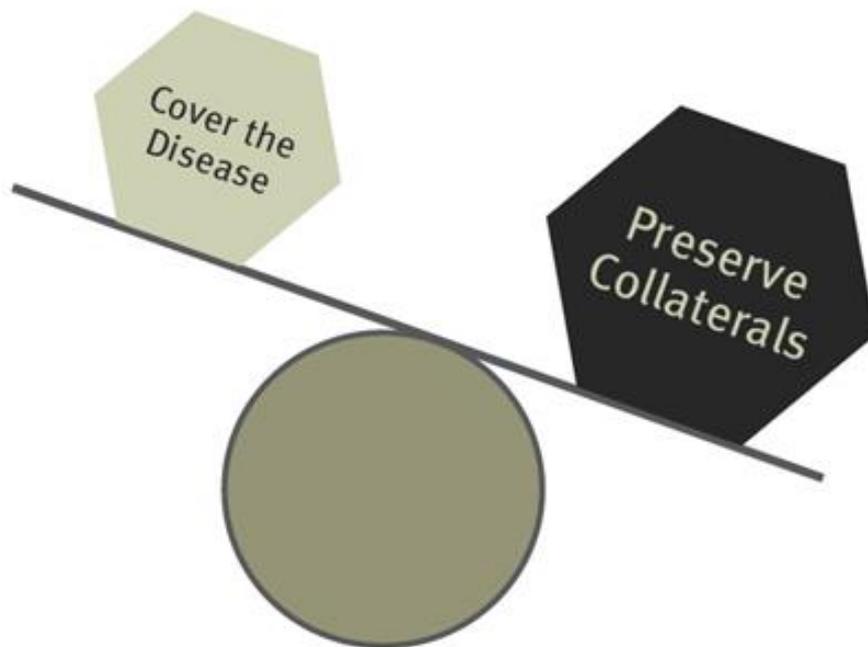
If the collateral were covered: when covered stent occluded, the risk of acute lower limb ischemia might be significantly increased.

The ideal state is not to cover the collaterals and obtain a good effect.



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Collaterals considerations: What's the proper balance

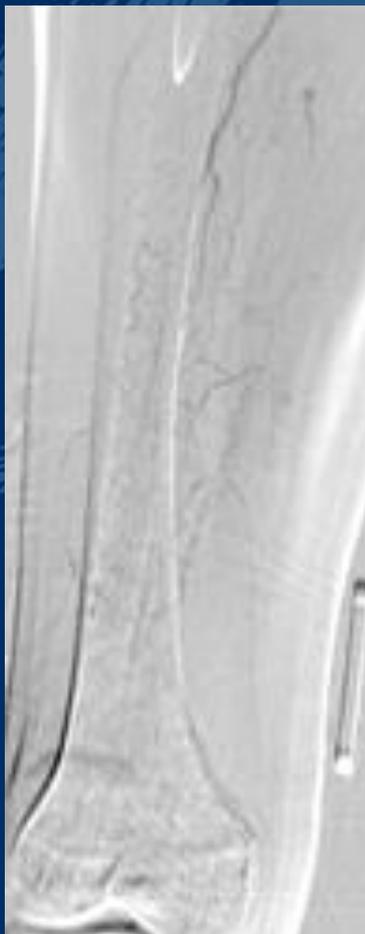


**Maintain the Alternate Flow Path if the Device
Becomes Occluded**



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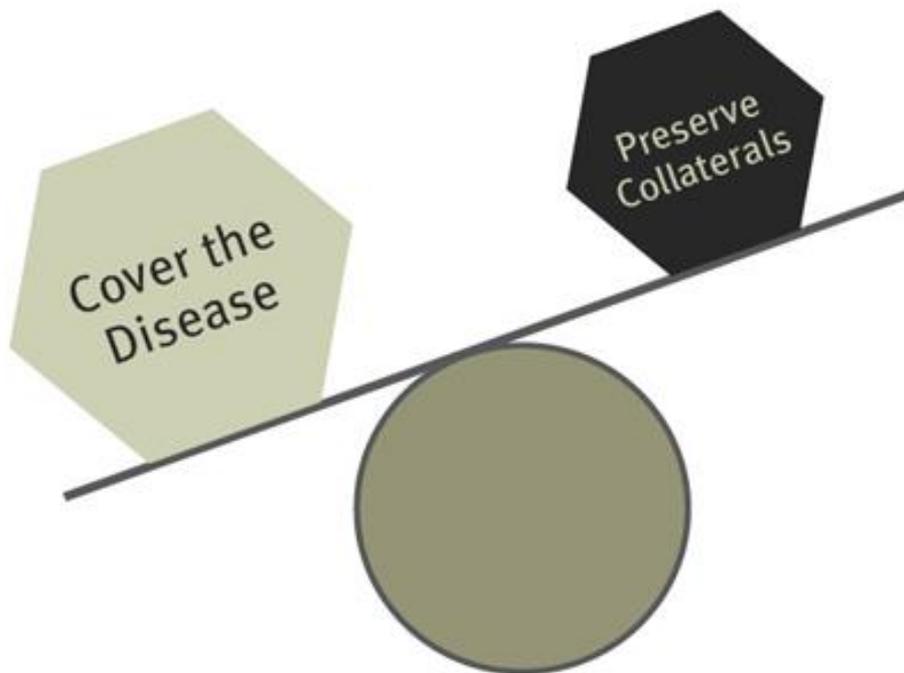
Occlusions of SFA and popliteal artery





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Collaterals considerations: What's the proper balance



**Perform Complete Revascularization
to Maximize Durability**



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Collaterals considerations: What's the proper balance

Lesions around the knee



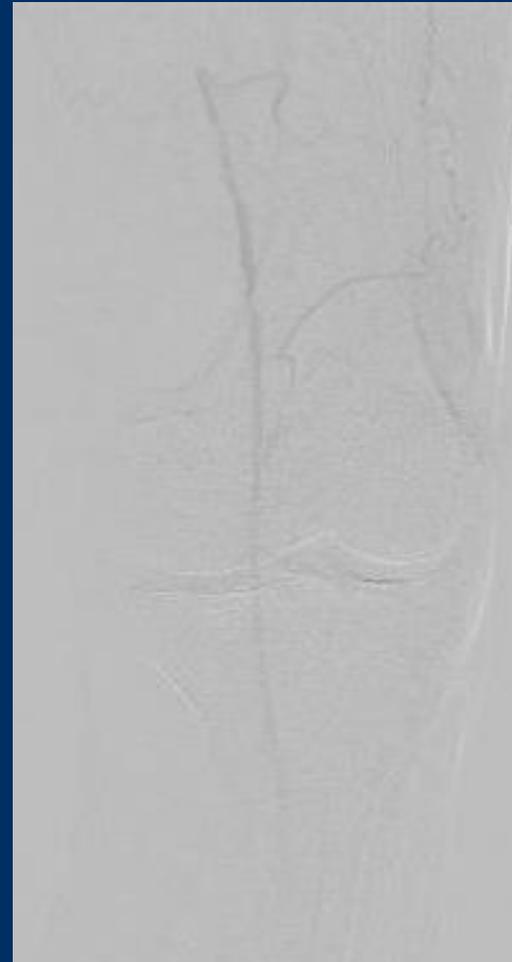
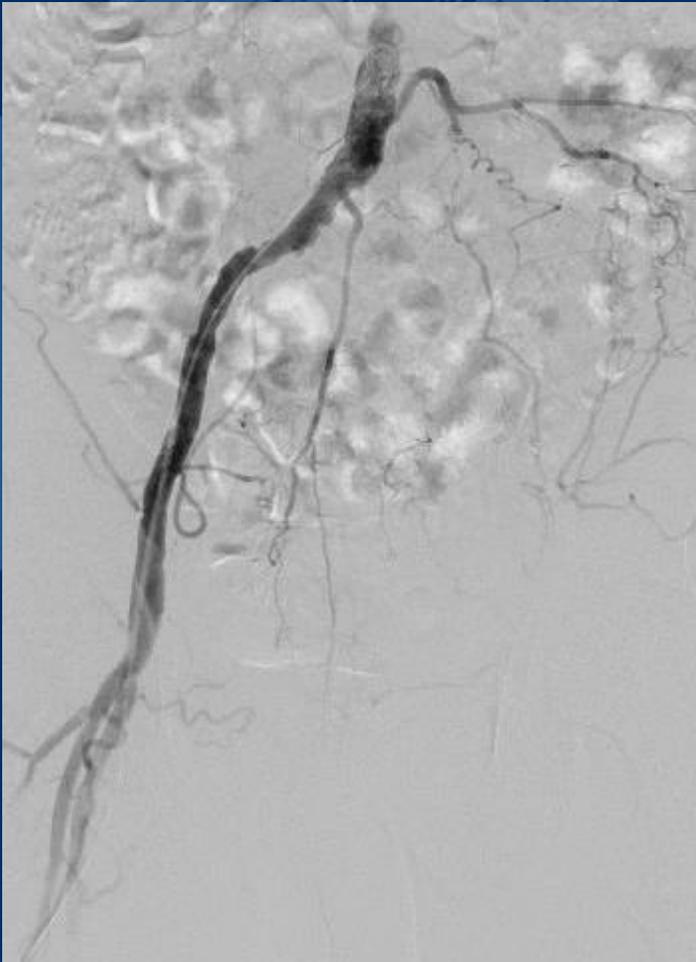
Covered stents



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Iliofemoral occlusion

The deep femoral artery was compensatory by the median sacral artery and the contralateral iliac artery branches

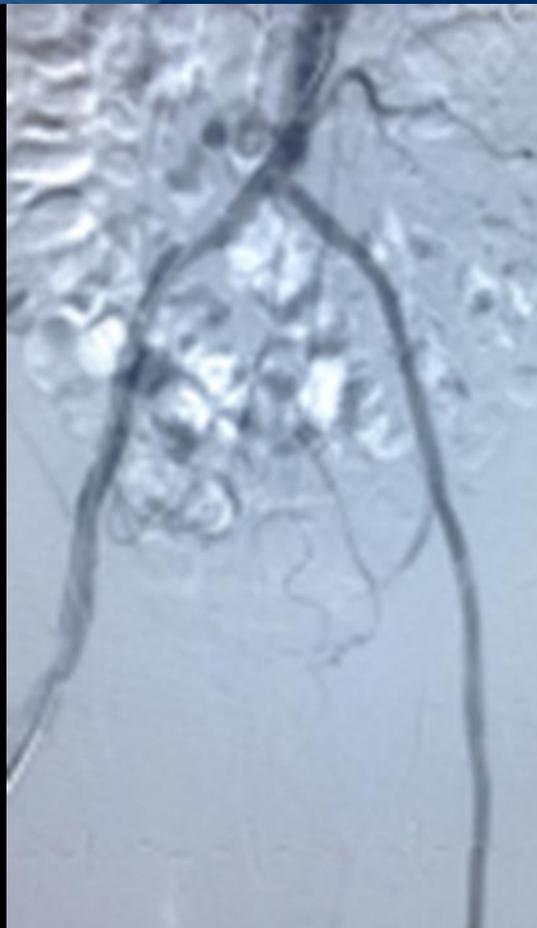




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Complete revascularization:

A large plaque locates on the opening of deep femoral artery



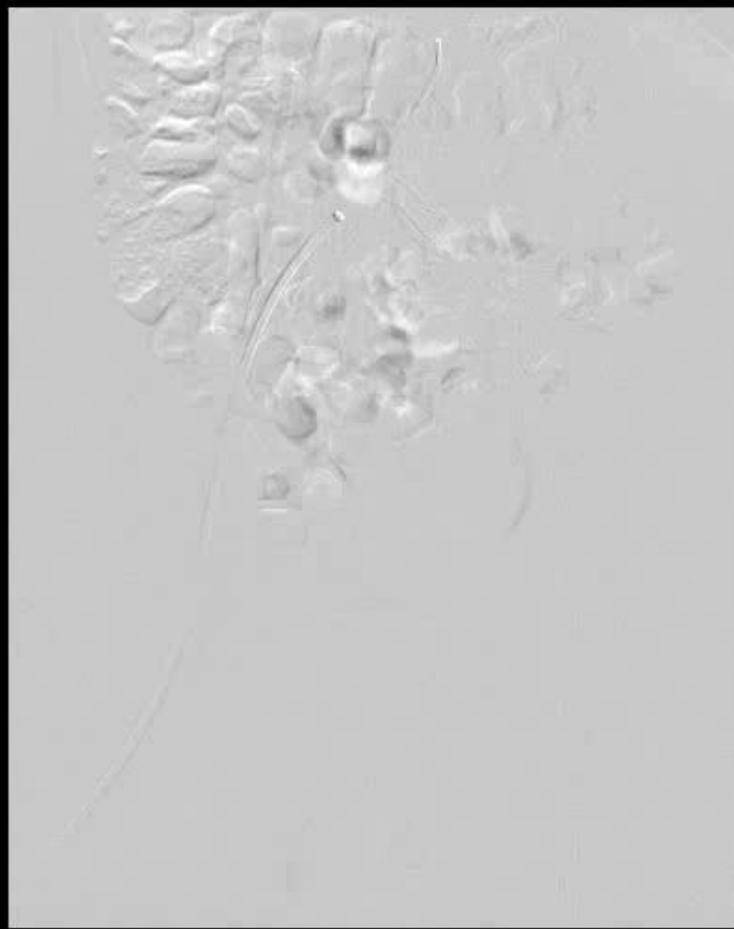


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Preoperation



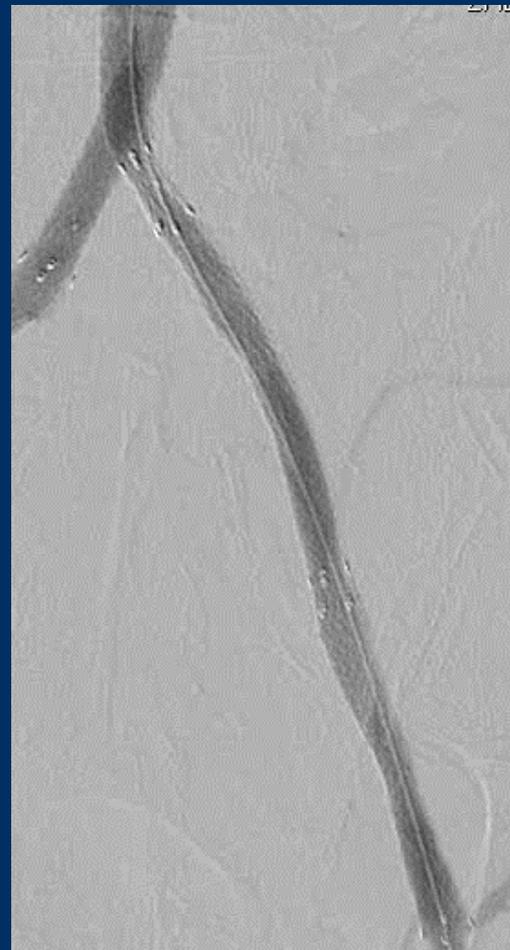
Post operation





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The internal iliac artery was injured during recanalization





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Summary:

- Endovascular treatment with covered stents is a good choice for lower extremity arterial disease. However, whether collaterals around the lesions could be covered is still bothering us.
- The ideal situation is to achieve both the retaining of collaterals and the effect of recanalization.



Summary:

- But when competing interest occurs, we can cover the collaterals to ensure the curative effect in the following situations:
 1. No function branches in the lesion area;
 2. Function branches in the lesion area, but blood is supplied by non anatomy vascular(collateral compensation). The collaterals would not provide direct blood supply even retained.
 3. The collaterals have been damaged around the lesions for some reasons;
 4. Due to the pathological characteristics of the collaterals around the lesion, branches were closed even using bare stent.



Thanks!