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## **Complex ilio caval reconstruction with nitinol stents**

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The logo for LING, featuring the letters 'LING' in white, overlaid on a stylized graphic of three curved, overlapping bands in dark blue, red, and yellow.

LING

# Complex ilio caval reconstruction with self-expanding nitinol stents

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Zürich**

# Disclosure

Speaker name:

Tim Sebastian

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



Why dedicated venous stents?

# Expectations

## **Precise deployment**

Less foreshortening

## **Flexibility**

Optimal accommodation to venous anatomy

## **Equally distributed radial force**

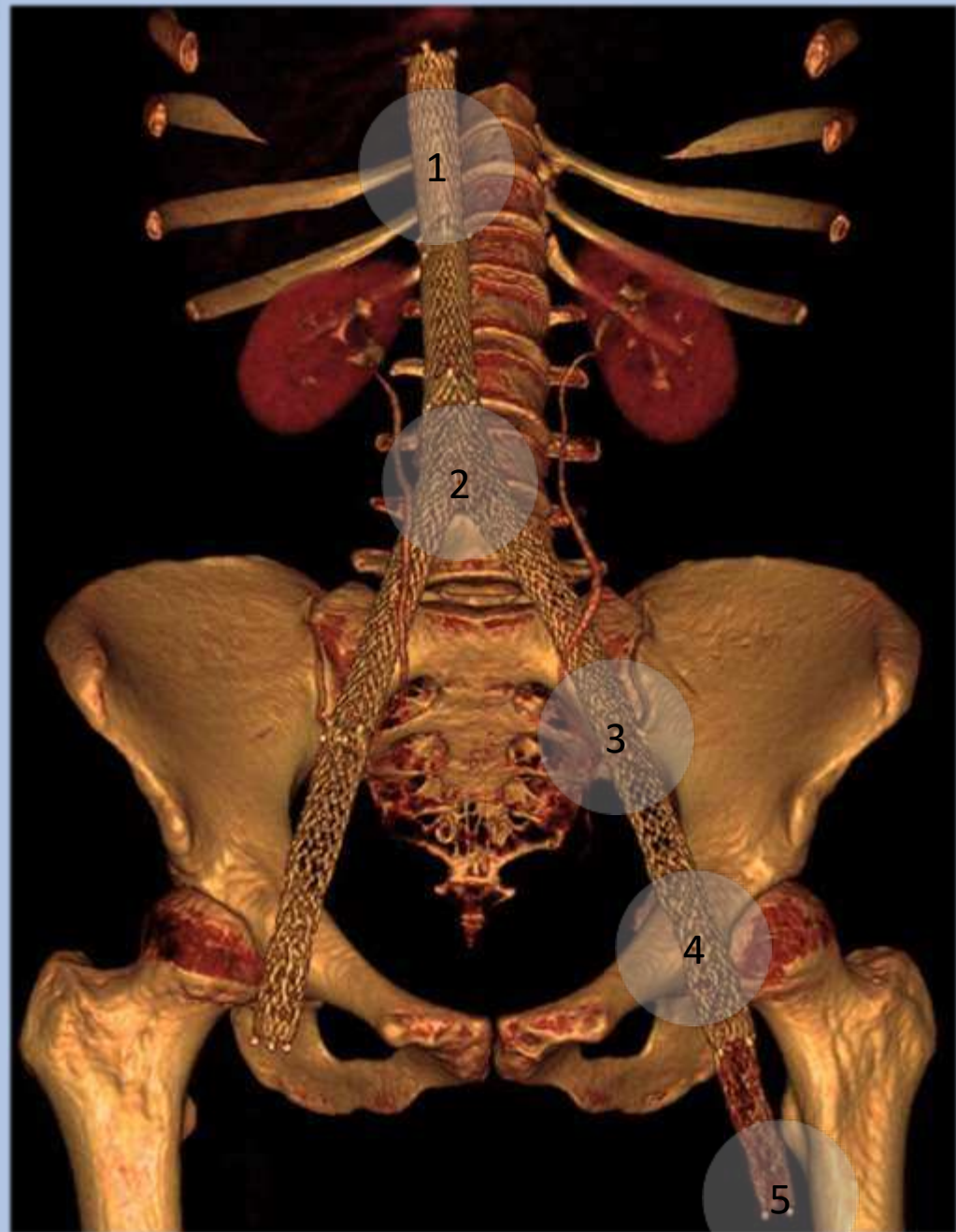
Throughout stent length

## **Wall coverage**

Protecting stent lumen from fibrotic tissue

## **Durability**

At critical sites



# Expectations

## **Precise deployment**

Less foreshortening

## **Flexibility**

Optimal accommodation to venous anatomy

## **Equally distributed radial force**

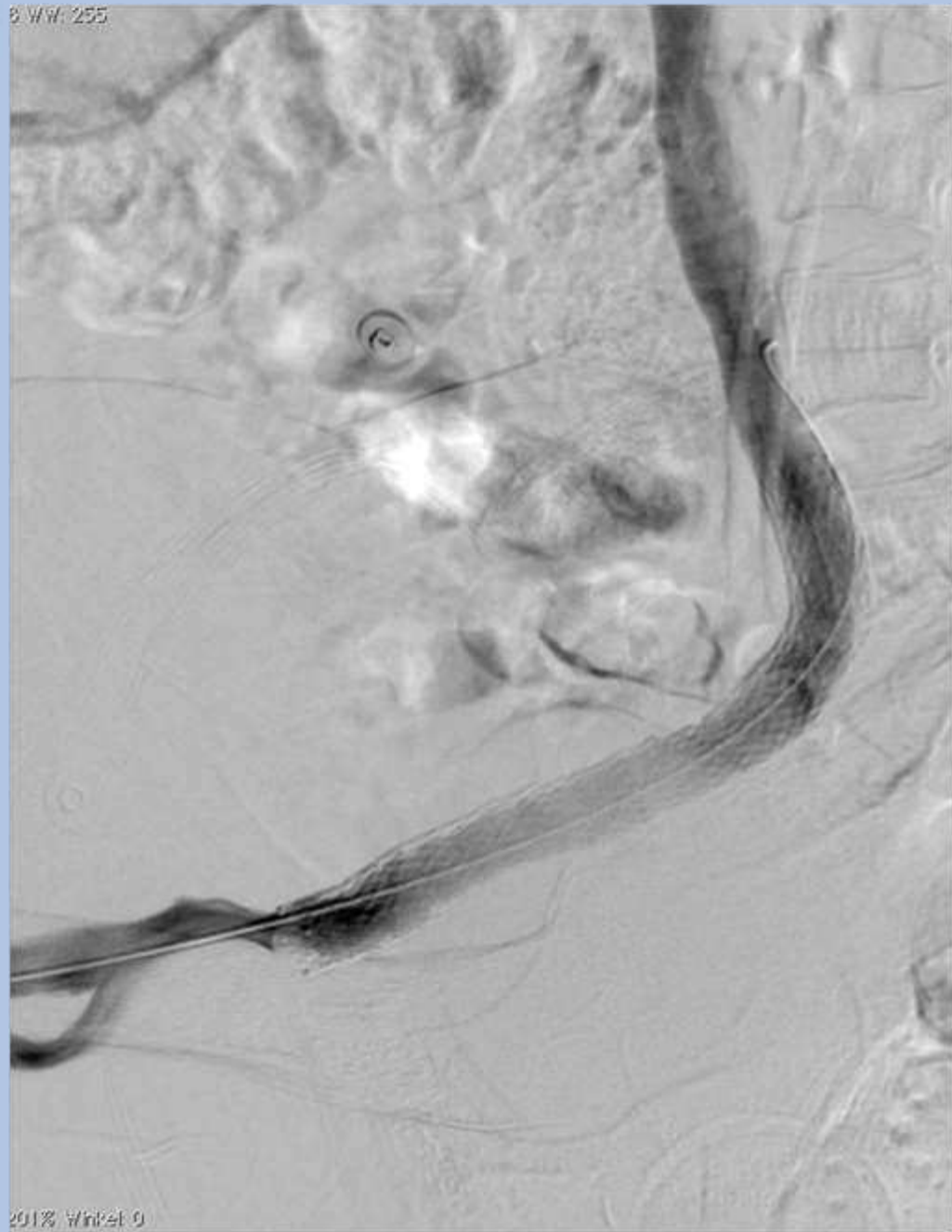
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## **Wall coverage**

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# Swiss Venous Stent Registry

**Prospective, on-going register** including patients who received venous stents in Switzerland since 2011

From **274** patients in the registry, **62** patients received caval or ilio-caval stent interventions **with nitinol stents** (212 excluded with ilio-femoral stents only)

## **Stents used:**

Sinus XL, Sinus XL Flex, Sinus Superflex (Optimed, Ettlingen, Germany)

Zilver vena (Cook, Bloomington, USA)

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# Baseline characteristics

**Mean age 46 ± 18 years, 14 women**

## **Index Diagnosis**

33 post-thrombotic syndrome (53%)

17 acute thrombosis (27%)

12 non-thrombotic IVC compression (19%)

## **22 external IVC compression**

16 cancer related, 3 retroperitoneal fibrosis, 1 echinococcosis, 1 abdominal aortic aneurysm, 1 vertebral screws

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# Procedural data

**Technical success** 61 (98%)

**CDT or PMT** 21 (34%)

**Iliac kissing stents** 52 (84%)

**IVC Filters** 0

**Mean number of stents** 4.5 ± 1.9 stents

**Mean stent length** 45 ± 20 cm

## Proximal landing zone

Right atrium 7 (11%)      Suprarenal 42 (68%)      Infrarenal 13 (21%)

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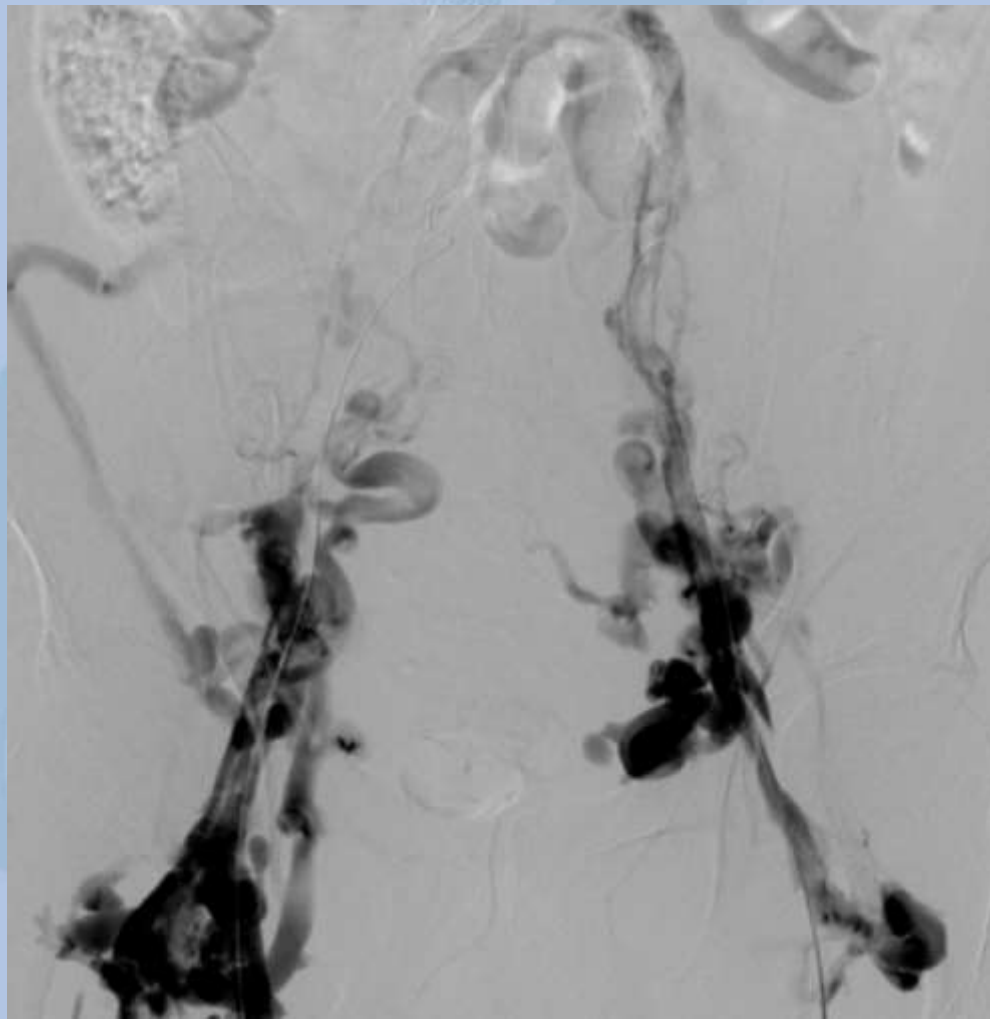
# Procedural data

<b>Type I: Single-segment stenosis:</b>	<b>4 (6%)</b>
<b>Type II: Multi-segment stenosis:</b>	<b>14 (23%)</b>
<b>Type III: Single-segment occlusion:</b>	<b>2 (3%)</b>
<b>Type IV: Multi-segment occlusion:</b>	<b>42 (68%)</b>

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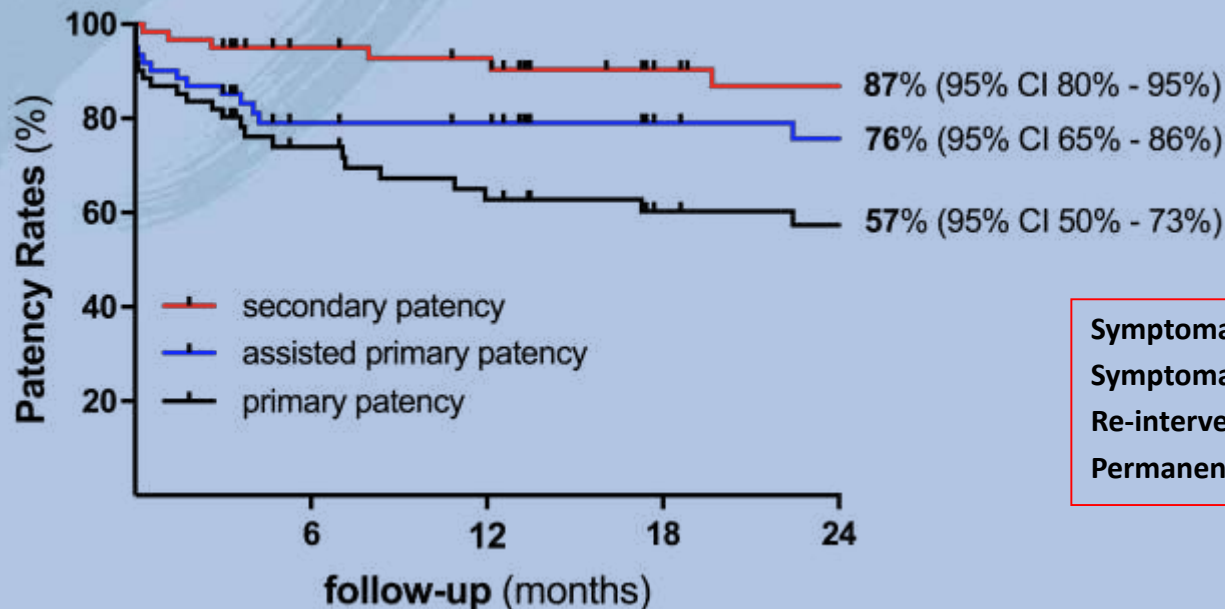
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# Patency Outcome

Mean follow up 21 months, **death** 4 (underlying malignant disease)



**Symptomatic stent occlusion: 13 (21%)**  
**Symptomatic stent stenosis: 10 (16%)**  
**Re-intervention: 22 (36%)**  
**Permanent loss of patency: 5 (8%)**

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# Clinical Outcome

**Ulcer healing:** 8/8 (100%)

**Development of new ulcers:** 0%

**Freedom of symptoms<sup>1</sup>:** 43%

**Significant clinical improvement<sup>1</sup>:** 48%

<sup>1</sup>: subjective symptom score as suggested by *Bozkaya et al.*

**Decrease in Villalta score:** 11.8 to 3.5

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# Clinical Outcome

<b>On-going anticoagulation therapy</b>	56 (92%) patients
DOACs	40 (66%) patients
Vitamin K antagonists	14 (23%) patients
LMWH	2 (3%) patients
+ P2Y12 antagonists	7 (11%) patients

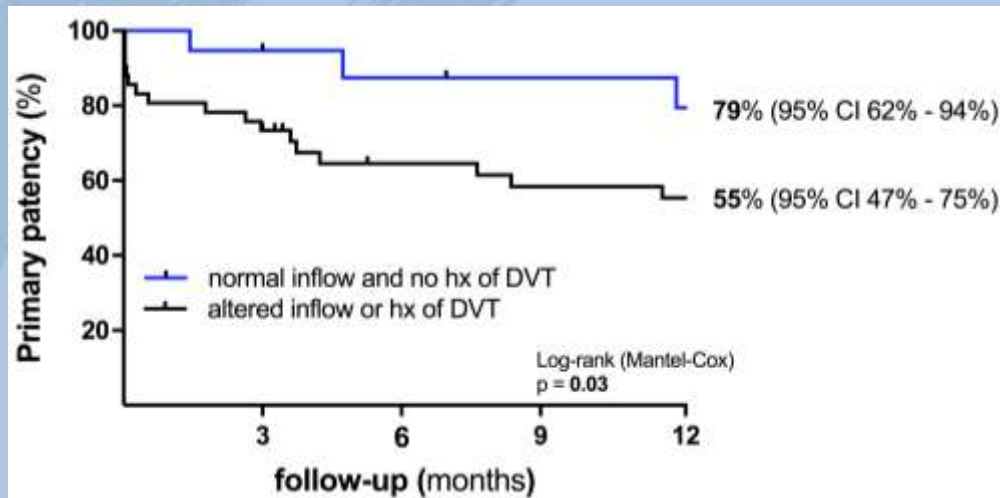
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# Predictors of patency loss

**Patients with a history of deep vein thrombosis and/or postthrombotic leg inflow veins are at high risk for primary patency loss.**



**Stenting below the inguinal ligament was not associated with loss of primary patency in our cohort.**

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# What's in the literature

Selection of recent publications on ilio-caval stent reconstruction

	N	Follow Up (months)	Acute Cases	Technical Success	Main Stent	Primary Patency	Secondary Patency	Ulcer Healing	Anti-coagulation
De Graaf 2015	40	15	15%	100%	Nitinol	70%	78%	N/A	VKA (min 6m)
Murphy 2016	71	48	0%	85%	Wallstent Z-Stent	52%	93%	78%	VKA ASS (life)
Chick 2017	120	24	48%	100%	Wallstent	87%	94%	88%	VKA/DOAC (min 6m) Clop (2m) ASS (life)
Erben 2018	66	42	2%	90%	Wallstent Z-Stent	78%	91%	100%	OAC (life)
Sebastian 2018	62	21	27%	98%	Nitinol	57%	87%	100%	VKA / DOACs (life)

IVC filter-associated: Murphy (54%), Chick (100%), Erben (38%)



# Conclusion

**Primary patency rate** beyond 2 years for nitinol stents is >55%

**Secondary interventions** are often necessary to maintain patency, most likely due to **impaired venous stent inflow**

**Secondary patency rates** can be as high as 90%

Role of **anticoagulation / anti-platelet** therapy is unclear

**Data for nitinol stents is similar** compared to Wallstents

The logo for LING features the word "LING" in white, uppercase letters. The letters are positioned over a stylized graphic consisting of two curved, brushstroke-like shapes. The upper shape is dark blue, and the lower shape is a mix of red and orange, suggesting a flame or a dynamic movement.

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**Thank you for your attention.**