Predictors of contra-lateral deep venous thrombosis after ilio-caval venous stenting

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Introduction

Percutaneous endovascular stenting has emerged during the last two decades as the preferred method to treat ilio-caval venous outflow obstruction\(^1\). During placement of venous stents close to the ilio-caval confluence, the cephalad end of the venous stent will by necessity project into the IVC to a variable extent; which may result in coverage of the contralateral venous outflow \(^2\). This may increase the risk of thrombosis of the normal contralateral ilio-femoral vein.

Objective

To investigate the factors that may bear on subsequent thrombosis of the normal contralateral CIV after iliac stenting, and evaluate the results of salvage revascularization.

Methods

**Inclusion criteria:** 102 patients treated for Left sided symptomatic ilio-caval VOO, between 2008 and 2015 in Galway University Hospital.

**Exclusion criteria:** All cases of initial right lower limb DVT, or initial IVC involvement and those without adequate follow up.

**Technique:** US guided ipsilateral Poptlelant V was mainly used (69%) for acute DVT, while the ipsilateral CTV (7%), PV, or right IIV were used for chronic patients. All patients suffering acute DVT underwent PIVT or CDT/PMT before stenting and then the underlying lesion was addressed \(^3\). Stents were often extended across the iliac confluence to treat all diseased segment with a variable degree of IVC extension of three categories:

1. Complete: >2cm
2. Partial: 1-2cm
3. Flush with Left CIV: <1cm

**Results**

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (Range)</td>
<td>52 (18 – 86)</td>
</tr>
<tr>
<td>Female gender</td>
<td>68 (66.7%)</td>
</tr>
<tr>
<td>History of Malignancy</td>
<td>42 (41%)</td>
</tr>
<tr>
<td>History of old DVT</td>
<td>17 (16%)</td>
</tr>
<tr>
<td>Thrombophilia</td>
<td>5</td>
</tr>
<tr>
<td>Postpartum</td>
<td>4</td>
</tr>
<tr>
<td>Hormonal</td>
<td>7</td>
</tr>
</tbody>
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- The mean time of developing right (contralateral) iliac vein thrombosis was 226 days (10-790 days).
- 7 cases (7102, 6.8%) developed contralateral DVT; 3 cases had May-Thurner syndrome, 3 cases had underlying malignancy and one case had a history of old DVT and suffered post-thrombotic manifestations.
- Four cases went through re-vascularization. Other three cases were managed conservatively due to malignancy of poor prognosis.
- No complications were detected during or after the second procedures.

Discussion

The largest series describing contra-lateral iliac vein thrombosis is with the braided stainless steelcobalt Wall stent (Boston Scientific, Galway, Ireland); this reported a contra-lateral thrombosis rate of only 1%. Typically these stents are landed quite high into the IVC covering the inflow of the right common iliac vein \(^4\). The higher incidence of contralateral DVT among Galway patients (6.8%) may possibly be partly explained by the routine use of CTV which almost certainly has a higher rate of pick-up of pelvic vein thrombosis compared to ultrasound \(^5\); in addition to the high incidence of underlying malignancy in this group (41.2% v 0%).

Conclusion

Stent placement across the ilio-caval confluence from the left CIV is associated with a low but definite rate of contra-lateral ilic vein thrombosis. Contralateral IIV thrombosis, pre-existing IVC filters, and anticoagulation non-compliance are significant predictors. Malignant compression effect is an independent risk factor.

Special attention should be paid to the method of detection of contralateral DVT; CTV is an important diagnostic tool and is probably superior to Color Doppler US for identification of abdomino-pelvic DVT. Future stent development may attempt to eliminate the need to cross into a healthy IVC and avoid risk of secondary contralateral venous thrombosis.

Bibliography