SUPERFICIAL THROMBOPHLEBITIS,
SUPERFICIAL VEIN THROMBOSIS

OBJECTIVE:
To provide an evidence-based approach to the diagnosis and management of patients presenting with superficial vein thrombosis (SVT).

BACKGROUND:
Superficial thrombophlebitis or superficial vein thrombosis (SVT) results from thrombus formation in a superficial vein with associated inflammation of the vessel wall and neighboring tissues. Although any superficial vein can be involved, SVT is most often observed in the lower extremities with greater saphenous vein (GSV) involvement in 60-80% of affected individuals. SVT is 6-fold more common than venous thromboembolism (VTE) with a yearly incidence rate of 0.64%.

Historically, SVT was thought to be a benign self-limiting local disorder, however, recent data have demonstrated that patients with SVT have a significant risk of systemic thrombosis. At diagnosis, approximately 25% of patients with SVT are found to have a concomitant VTE (23.4% deep vein thrombosis [DVT] and 3.9% pulmonary embolism [PE]). In addition, a prior history of SVT results in a four-fold increased risk for PE and six-fold increased risk for DVT.

Risk factors for SVT are similar to those for DVT and PE and include active malignancy or cancer therapy, surgery, trauma/injury, immobilization, obesity, estrogen use/pregnancy, a personal or family history of VTE and inherited thrombophilia. In addition, SVT often occurs in the presence of varicose veins (present in up to 80% of SVT patients).

DIAGNOSIS:
Unlike for DVT and PE, there are no validated clinical prediction scores to determine pre-test probability and guide investigations for SVT. Thus, the diagnosis of SVT is generally made clinically, based on the presence of characteristic signs and symptoms including erythema, warmth and tenderness along a palpable cord. Due to the improved awareness of concomitant DVT, venous compression ultrasound (CUS) assessment of suspected SVT is being increasingly used to rule out DVT. CUS can also help direct clinical management by confirming the presence of SVT and delineating the length of the thrombus and proximity to junctions with the deep venous system (which cannot be determined by physical exam alone). Similar to the diagnosis of DVT, non-compressibility and lack of flow in the affected superficial vein are indicators of the presence SVT.

Performance of CUS should be considered in patients with clinically diagnosed SVT, particularly those with symptoms above the knee or located close to the popliteal fossa, in those with symptoms
suggestive of DVT and in patients with VTE risk factors. Patients with below the knee SVT restricted to a varicose vein without additional VTE risk factors may not require US assessment.

**TREATMENT OF SVT:**

**Goals of treatment:** Treatment goals in patient with SVT include symptom reduction, prevention of recurrent/progressive SVT, extension into the deep venous system and development of PE.

**General measures:**

- Outpatient management is adequate and preferred over hospital-based treatment unless there is an additional indication for hospitalization.
- As approximately 4% of patients with SVT will have a concomitant PE, all patients should be assessed for a history of PE symptoms (dyspnea, pleuritic chest pain, syncope and palpitations). If PE symptoms are present appropriate diagnostic testing scan should be performed [See Pulmonary Embolism (PE) Guide].
- Patients with upper extremity SVT associated with vein cannulation or IV catheters should be assessed for signs of infection (fever, purulent discharge at insertion site).

**Approach to treatment:** Once SVT is diagnosed, treatment will depend on whether or not a concomitant DVT is identified and on the extent and most proximal location of the SVT (see Figure 1 for management algorithm).

- Patients in whom a **concomitant DVT** is identified should be managed with **therapeutic anticoagulation** as per VTE management guidelines (see Deep Vein Thrombosis (DVT): Treatment guideline).
- Isolated SVT which extends to **within 3 cm of the saphenofemoral junction (SFJ)** is associated with a very high risk of progression into the deep venous system. Consensus guidelines suggest these patients should also receive **therapeutic doses of anticoagulation** as per VTE management guidelines (see Deep Vein Thrombosis (DVT): Treatment guideline).
- Isolated SVT **greater than 5 cm in length** located more than 3 cm from the SFJ should receive **prophylactic doses of fondaparinux, rivaroxaban 10 mg po daily or prophylactic/intermediate doses of LMWH** for 45 days. If a parenteral anticoagulant is selected Fondaparinux is preferred over LMWH as evidence supporting the use of fondaparinux is of higher quality. However, given the lower cost of LMWH and the assumption that anticoagulation with LMWH would have similar efficacy and safety as fondaparinux, LMWH is an acceptable option. Rivaroxaban has only been studied in patients at higher risk of venous thromboembolic complications (at least one additional risk factor including older than 65 years, male sex, previous venous thromboembolism, cancer, autoimmune disease, thrombosis of non-varicose veins). Patients can also receive topical NSAIDs and/or compression therapy for symptomatic relief in conjunction with anticoagulation.
- Isolated SVT less than 5 cm in length located more than 3 cm from the SFJ can be treated with oral NSAIDs for symptomatic relief. Patients treated with NSAIDs alone should be reassessed 7 to 10 days after diagnosis to ensure that there is no evidence of clinical progression. In patients with isolated SVT less than 5 cm in length located more than 3 cm from the SFJ with severe symptoms or risk factors for extension (prior history of DVT/PE or SVT, cancer, pregnancy, hormonal therapy, recent surgery or trauma) treatment with prophylactic doses of fondaparinux,
prophylactic doses of rivaroxaban or prophylactic/intermediate doses of LMWH for up to 45 days can be considered.

- Superficial thrombophlebitis associated with IV cannulation is not generally treated with anticoagulation. Supportive measures such as warm compresses and topical NSAIDs can be considered for symptom relief.

**TREATMENT OPTIONS:**

**Non-steroidal anti-inflammatories (NSAIDs):** Studies comparing systemic NSAIDs to placebo have demonstrated a reduction in symptoms as well as SVT extension/progression, with no effect on VTE or major bleeding rates. Topical NSAIDs have been shown to reduce symptoms, but no data exists on their effect on SVT extension/recurrence of VTE. Systemic NSAIDs should not be used in patient receiving anticoagulants due to an increase risk of bleeding complications. Patients receiving systemic NSAIDs should be counselled regarding the risk of gastrointestinal bleeding and cytoprotection can be considered in high risk patients and those above age 65 years. Topical NSAIDs may be used in conjunction with anticoagulants for symptomatic relief. Suggested dosing for topical and systemic NSAIDs are shown in Table 1.

Anticoagulants:

- **Fondaparinux:** In a large randomized controlled trial comparing 45 days of fondaparinux 2.5 mg SC daily to placebo, fondaparinux was associated with a significant reduction in symptomatic VTE and SVT progression/extension with similar rates of major bleeding.8 Fondaparinux is exclusively cleared through renal excretion and should be used with caution in patients with a creatinine clearance of 30-50mL/min and avoided in patients with a creatinine clearance < 30 mL/min.

- **Low molecular weight heparin (LMWH):** Studies evaluating prophylactic or intermediate-doses of LMWH (compared to NSAIDs or placebo) demonstrated a reduction in symptoms and recurrent or progressive SVT, but failed to show a significant reduction in symptomatic VTE. Although there is no direct evidence demonstrated a reduction in symptomatic VTE with LMWH therapy, it can be assumed that LMWH would be similar in efficacy and safety to fondaparinux. As LMWH is less costly then fondaparinux, many consider it an acceptable option for treatment of SVT. Suggested dosing for prophylactic and intermediate doses of LMWH are shown in Table 1.

- **Warfarin:** No high quality studies evaluating exist evaluating the use of warfarin for the management of SVT.

- **Direct oral anticoagulants:** In a large randomized controlled trial comparing rivaroxaban (Xarelto®) 10 mg daily to fondaparinux 2.5 mg SC daily for 45 days in patients with SVT ≥5cm with at least one risk factor for progression, rivaroxaban was non-inferior to fondaparinux for the prevention of symptomatic VTE, recurrent or progressive SVT and all-cause mortality. A study comparing 45 days of rivaroxaban 10 mg daily to placebo in patients with SVT ≥5cm who would not otherwise be treated with anticoagulation is currently ongoing. Dabigatran [Pradaxa®], edoxaban [Lixiana®], and apixaban [Eliquis®] have not formerly been evaluated in management of SVT.

Supportive care: Supportive modalities including local heat application, elevation of the affected limb and compression stocking may provide symptomatic relief and can be used as adjunctive treatments.
Table 1: Suggested dosing regimens

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Suggested dosing</th>
<th>Duration of treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMWH</td>
<td>Dalteparin 5,000-10,000 units SC daily</td>
<td>45 days</td>
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<tr>
<td></td>
<td>Enoxaparin 40-80 mg SC daily</td>
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<tr>
<td></td>
<td>Nadroparin 2,850-5,700 units SC daily</td>
<td></td>
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<tr>
<td></td>
<td>Tinzaparin 4,500-10,000 units SC daily</td>
<td></td>
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<tr>
<td>Fondaparinux</td>
<td>2.5 mg SC daily</td>
<td>45 days</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>10 mg PO daily</td>
<td>45 days</td>
</tr>
<tr>
<td>Oral NSAIDs</td>
<td>Ibuprofen 400 mg PO TID</td>
<td>7 days</td>
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<tr>
<td></td>
<td>Naproxen 500 mg PO BID</td>
<td></td>
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<tr>
<td>Topical NSAIDs</td>
<td>Topical diclofenac [Voltaren Emugel®] apply 2 to 4 g to affected area 3 or 4 times daily</td>
<td>7-14 days</td>
</tr>
</tbody>
</table>

**SPECIAL POPULATIONS:**

**Pregnancy**
No randomized studies have formerly assessed the management of SVT during pregnancy. Guidelines recommend prophylactic or intermediate doses of LMWH for a fixed period (1 to 6 weeks) in pregnant women with SVT that is bilateral, symptomatic, ≤5 cm from the deep venous system or ≥5 cm in length. If no treatment is administered clinical follow-up and repeat US is recommended within 7 to 10 days. Warfarin and DOACs are contraindicated in pregnancy as these medications can cross the placenta (see Pregnancy: Venous Thromboembolism Treatment).

**Pediatrics**
Data regarding the management of SVT in this population are very limited. If possible, pediatric hematologists with experience in thromboembolism should manage children with or at risk for SVT. When this is not possible, a combination of a neonatologist/pediatrician and an adult hematologist, supported by consultation with an experienced pediatric hematologist, should manage these children.
**Figure 1: Approach to management of SVT.** DVT, deep vein thrombosis; NSAID, non-steroidal anti-inflammatory; LMWH, low molecular weight heparin

**OTHER RELEVANT THROMBOSIS CANADA CLINICAL GUIDES:**

- Deep vein thrombosis (DVT): Diagnosis
- Deep vein thrombosis (DVT): Treatment
- Pulmonary embolism (PE): Diagnosis
- Pregnancy: Venous Thromboembolism Treatment
- Rivaroxaban (Xarelto®)
- Unfractionated Heparin, Low Molecular Weight Heparin and Fondaparinux

**REFERENCES:**

References:


Date of version: 2017June13

Please note that the information contained herein is not to be interpreted as an alternative to medical advice from your doctor or other professional healthcare provider. If you have any specific questions about any medical matter, you should consult your doctor or other professional healthcare providers, and as such you should never delay seeking medical advice, disregard medical advice or discontinue medical treatment because of the information contained herein.