

89. Klippel Trenaunay Syndrome and Clots

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Q: “Our 17 year old daughter has Klippel-Trenaunay Syndrome and recently had a DVT (deep vein thrombosis) and PE (pulmonary embolism). She is now on coumadin® (warfarin). How long should she stay on it? We also heard that there is a high risk of developing another clot while on coumadin®. Is that true? Should she be switched to a different blood thinner, such as Lovenox® (Enoxaparin)? Should she have an IVC filter to prevent further PEs?”

A: See discussion below.

What is Klippel-Trenaunay Syndrome?

Klippel-Trenaunay Syndrome (KTS) is a rare disorder that people are born with. Individuals have abnormal growth of masses of blood vessels (hemangiomas; see photograph below), excessive growth of the soft tissue and bone of a leg and/or arm, and have varicose veins. The cause of the disorder is poorly understood, but there is evidence that genetic mutations lead to overactivity of proteins involved in blood vessel formation (ref 1). KTS affects only one side of the body, typically the leg or the arm, sometimes both. It can also involve the trunk and face and inner organs. Often, the hemangiomas consist of purplish-reddish birthmarks on the skin (see photograph, left leg affected). The symptoms and findings associated with the disorder vary from individual to individual. Chronic pain and swelling of leg and arm can be a problem. The swelling may lead to skin breakdown (ulcers). Some individuals develop DVT and PE. A patient support group for Klippel-Trenaunay Syndrome exists with an informative website - www.k-t.org.



DVT and PE

Deep vein thrombosis (DVT) and pulmonary embolism (PE) are well known complications of Klippel-Trenaunay Syndrome. Clots probably form because (a) blood flow in the abnormal vessels is slow and disturbed (stasis) and because clotting proteins are activated in these abnormal vessels (coagulation activation). A study of 49 patients with KTS showed that 11 (22.5 %) had thrombosis problems: namely, 7 had PE and 8 DVT (ref 3). Another study of 47 children with KTS showed DVT or PE in 11 % and superficial thrombophlebitis in 53 % (ref 4).

The recurrence rate of blood clots and the best treatment are not known. Open questions are:

- Do patients need to be on long-term warfarin (coumadin®) after they have had an episode of DVT or PE?
- Should they be treated with warfarin or low molecular weight heparin (Lovenox®, Fragmin®, Innohep®, etc.)
- Should an IVC filter be placed to prevent recurrences of PE?
- What is the risk of recurrence of DVT or PE during pregnancy and how should pregnant women with KTS be

managed?

A 2005 publication (ref 5) which reviewed all published cases of PE in individuals with KTS (10 patients are listed in the analysis) summarizes that several patients had recurrent DVT or PE in spite of being on warfarin (coumadin®). The authors of the article, therefore, conclude that "if DVT or PE is diagnosed, then these patients should receive therapy with low molecular weight heparin". However, it has not been studied whether low molecular weight heparin is more effective in preventing blood clots. At present, it appears fair to conclude, that there is some risk for recurrence of DT and PE, even while the patient is on adequate doses of warfarin. However, because of lack of studies, publications and extensive experience, there are no established and accepted guidelines on treatment. Individual decisions need to be made

It is not clear whether patients with KTS who have had a DVT and/or PE may benefit from having an IVC filter placed (a filter into the big vein in the abdomen, the IVC=inferior vena cava - (also see: [Ask The Doctor #4](#)). Since some patients have abnormal vessels bypassing the IVC, a filter may not be protective. Also, the IVC may be involved by the disorder and may be tortuous and wider than usual, making it difficult or impossible to find a filter big enough to fit and stay in place. Once again, individual decisions need to be made. Lastly, since varicose veins may also be seen in the inner organs, such as the intestine, some patients with KTS already have an increased risk for bleeding, putting the patient at even higher risk for bleeding if long-term blood thinners are used.

References:

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3. Baskerville PA et al: Thromboembolic disease and congenital venous abnormalities. Phlebologie 1987;40:531-536.
4. Samuel M et al: Klippel-Trenaunay syndrome: clinical features, complications and management in children. Br J Surg 1995;82:757-761.
5. Hiras EE et al: Pulmonary thromboembolism associated with KTS. Pediatrics 2005;116:e596-e600.