

68. Arm clots

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Q1: "My daughter was 16 years old when her arm became swollen and was diagnosed with multiple clots in her arm subclavian vein. She was not on birth control pills and we still have no idea why the clots formed. She had not sustained any injuries. It's still a mystery. She was in the hospital for a week and is now on coumadin® for 6 months. She is positive for factor V Leiden. We just hope after treatment that she never has another episode"

A1: This is very typical for arm DVT: young people develop them out of the blue. They are often called "effort thrombosis" because they are often observed in athletes. For a full assessment of the described patient I would want to know whether (a) her clot resolved and whether she has a narrowing of the axillary vein (= thoracic outlet syndrome) by venography, (b) she is heterozygous or homozygous for factor V Leiden, (c) other thrombophilia laboratory work-up was done, (d) she still has arm symptoms and, if she does, whether she wears a compression sleeve. The decision on need for thoracic outlet surgery (see below) and length of warfarin (= coumadin®) therapy needs to be individualized and is often difficult.

Q2: "My son spent his 18th birthday in the hospital with a blood clot in the right side subclavian vein. He has played varsity baseball for 4 years and has already signed a college scholarship (he is a right handed pitcher). His junior year our team won the State Playoffs and he was voted the MVP. After pitching on a Friday night, by Saturday his right arm was swelled and red. He is now on coumadin®. One hematologist suggests he never play sports again. He has high hopes on going to play pro baseball some day.

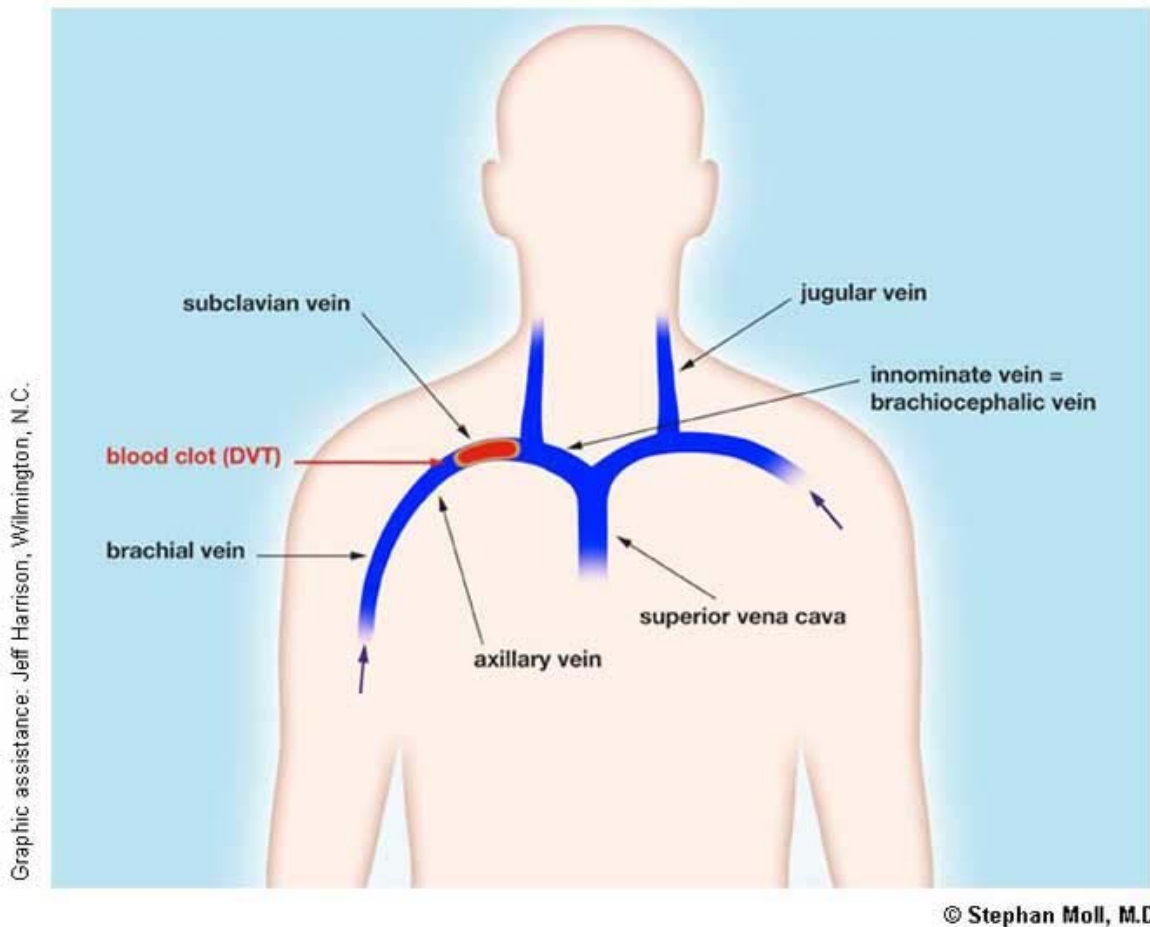
A2: This is a typical case of "effort thrombosis" - a DVT develops in an athletic person in the arm which is used for frequent, forceful repetitive movements (baseball pitching). The clot may form secondary to a preexisting narrowing of the "thoracic outlet" (compression of the axillary vein), or to repeated microtrauma to the arm veins; there may also be an additional underlying clotting disorder (thrombophilia). Details are needed for full assessment: is this patient's subclavian vein patent after he has been treated for a few months with warfarin? Does a venogram show narrowing of the axillary vein (= thoracic outlet syndrome)? Would thoracic outlet surgery be beneficial? If he remains long-term on coumadin®, his baseball career is probably over. One should consider thoracic outlet surgery and discuss with the surgeon the expected recovery of full shoulder function, to assess whether the patient will be able to return to highest quality pitching, good enough to go pro; if the patient has thoracic outlet obstruction and does not undergo surgery, discontinuation of coumadin® after 6 months and resumption of high-level pitching, the risk for recurrent arm DVT would probably be high. Very difficult and far-reaching decisions need to be made.

Q3: "I am 20 years old. Just this past week I was diagnosed with blood clots in my left arm and neck. I am curious, how long does a patient need to be on coumadin® and how long should we have to be away from work and school.

A3: In the acute setting clot busters (thrombolytic drugs) can be considered. The length of warfarin therapy for arm DVT depends on the circumstance of the clot and the therapy chosen. Several options should be discussed and considered: (a) 6 months of full-dose warfarin, (b) indefinite full-dose warfarin (target INR 2.0-3.0); (c) six months of full-dose warfarin, followed by thoracic outlet surgery (rib resection). Individualized decisions need to be made. The arm should be rested and elevated until the swelling decreases. An individually fitted compression sleeve should be worn for weeks or months if there is any swelling.

Q4: "My husband was recently diagnosed with one factor V Leiden and one factor II (prothrombin) mutation. 3 years ago he had an effort thrombosis of the subclavian vein in his right arm at age 26. He was initially treated with urokinase (= "clot buster") and coumadin®, and eventually he underwent rib resection to relieve what was believed to be compression of the subclavian vein in the space between the first rib and the right clavicle. Due to this history his doctor has recommended coumadin® therapy, but my husband is an avid sportsman and is resisting his advice.

A4: This is another example of "effort thrombosis" and the possible treatments. If the pressure on the axillary and subclavian veins has been relieved by surgery and the veins do not have any residual clot, one may consider discontinuation of warfarin (= coumadin®).



While most deep venous thromboses (DVT) occur in the leg, they can also form in the deep veins of the arm. The deep veins of the arms are called "axillary vein" and "subclavian vein" (see figure). Risk factors are (a) central venous catheters, (b) strenuous exercise, (c) thrombophilias (such as factor V Leiden, prothrombin 20210 mutation, and others), (d) oral contraceptives and hormone replacement therapy. Arm DVT often affects young, active, otherwise healthy individuals. In some of these individuals pressure by a cervical rib or the first rib, or by slightly atypically running muscle strands puts pressure on the axillary vein (see figure), leading to compression and thrombosis. The disorder has therefore also been called "thoracic outlet syndrome". And since it has been observed in physically very active persons, it has also been termed "effort thrombosis". Another term is Paget-von-Schoetter syndrome. Symptoms are similar to DVT symptoms in the leg: diffuse pain and swelling of the arm and slightly bluish discoloration, possibly some prominence (dilatation) of the superficial veins of the arm and upper chest wall. During the acute phase of the clot formation (first 2-3 weeks of symptoms) pieces of the clot may break off and travel to the lung, causing pulmonary embolism (PE).

These arm DVTs are not to be confused with superficial thrombophlebitis of the arm. Superficial thrombophlebitis is a localized thrombosis of superficial arm veins. It is typically very painful, but the pain is localized. Superficial thrombophlebitis is not dangerous, since it does not cause pulmonary embolism. Symptoms are typically (a) intense localized pain, (b) localized redness (c) localized swelling, and often (d) a palpable cord. Superficial thrombophlebitis is often triggered by a peripheral venous catheter.

Treatment of arm DVT: In the young person with extensive arm DVT thrombolytic therapy with "clot busters" should be considered, followed by heparin and warfarin. If the deep arm veins open up then a venogram with the arms by the side and lifted above the head may be indicated to determine whether there is compression of the axillary vein (thoracic outlet syndrome). If a residual narrowing or compression is found, then stenting or "thoracic outlet syndrome surgery" (rib resection) should be considered. However, this is a complex and big decision, which should involve a good hematologist, the input from a vascular radiologist and a vascular surgeon.

No generalized recommendations can be given as to how long to treat the patient with arm DVT with blood thinners (warfarin = coumadin®). It is not well known, what the risk of recurrence is once these patients discontinue (warfarin = coumadin®). A recent study (reference 1) examined (a) the risk of recurrent clots, and (b) the risk of long-term arm problems (swelling, pain), called "postthrombotic syndrome" by studying 53 patients with arm DVT and following them over 5 years. Recurrent clots occurred only in 3 patients (involving the same extremity in 2), but the publication unfortunately does not mention how many of the patients were kept on warfarin (= coumadin®) for only a short time (6 months or similar) and how many stayed on long-term warfarin. Regarding persistent symptoms, the study demonstrated that postthrombotic syndrome occurred in one-fourth of patients (27 %) within the first 2 years.

Depending on the patient's thrombosis risk factors, residual clot, and lifestyle, one needs to consider (a) long-term full-dose warfarin (INR 2.0-3.0), (b) long-term low-dose warfarin (INR 1.5-2.0), (c) discontinuation of warfarin, (d) thoracic outlet surgery. The decision is always an individual one.

References

1. Prandoni P et al.: The long-term clinical course of acute deep vein thrombosis of the arm: prospective cohort study. *BMJ* 2004;329:484-485.
2. Lokanathan R et al.: Outcome after thrombolysis and selective thoracic outlet decompression for primary axillary vein thrombosis. *J Vasc Surg* 2001;33:783-8.