



By
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A patient of mine was admitted to the Medical Center hospital with massive swelling in both legs from the groin to the ankles. He had recently travelled from Europe to South America on a non-stop flight, while sitting in the plane for 14 hours. He rarely ever got up from his seat. An ultrasound test of his legs confirmed that he had extensive blood clots in his legs obstructing the large veins draining the blood from the legs to the heart that had resulted in massive swelling of both his legs. He was treated with heparin and intravenous blood thinner and later switched to warfarin an oral blood thinner. He left the hospital with swollen legs.

The above mentioned patient had developed blood clots in the legs which are commonly known as the deep venous thrombosis or [DVT]. The blood clots may occasionally travel to the lungs which in rare cases can be fatal.

Where do the blood clots come from?

Generally the blood clotting occurs when there is injury to a tissue to prevent further bleeding. However, due to a variety of reasons, the blood clot may develop within the cardiovascular system that can cause problems. The blood clot could develop in the leg veins or the pelvic veins. From there, they could travel to the lungs. The clots could also develop in the heart chambers and

migrate into the circulation thus blocking an artery in the brain, gut or the legs causing acute and sometimes serious symptoms such as stroke or ischemic legs.

Why do people develop blood clots?

The blood coagulation mechanism can be adversely affected by a variety of conditions that can predispose a person to develop clots within the veins or arteries. Prolonged rest predisposes people to develop clots especially in the legs. This can happen in people who sit for a long time where the venous circulation is cut off or in hospitalized patients who are bed ridden and unable to move after surgery, fracture, or other conditions.

Other conditions that predispose to venous thrombosis are smoking, obesity, minor injuries, hormone contraceptives, and cancer. Irregular heart rhythm such as atrial fibrillation is a frequent cause of clot formation in the heart that can result in stroke or blue toes.

Certain congenital diseases can alter the coagulation processes and cause clot formation. These conditions need extensive testing to confirm their diagnosis.

What are the dangers of blood clots?

Blood clots anywhere inside the body could be dangerous and could lead to a variety of complications.

Thrombophlebitis is a condition when the clots in the calf veins can get inflamed and cause swelling redness, and calf pain and tenderness. It can be diagnosed by an ultrasound which can detect the presence of blood clot in the leg veins. The treatment usually involves bed rest, blood thinners such as heparin for acute treatment and

warfarin for 3-6 months. The same treatment applies to people with clots in the legs without inflammation. If left untreated, the clots could get bigger and bigger, block venous flow, increase fluid retention in the legs, leading to venous insufficiency. The valves within the veins may get damaged leading to chronic leg swelling.

Pulmonary Embolus: It occurs when the clots in the legs or pelvis can migrate to the right side of the heart and lodge in the pulmonary veins resulting in pulmonary embolus which may become a life threatening condition. These patients may experience sudden onset of chest pain and shortness of breath. These symptoms may also mimic a heart attack. Time is of the essence in diagnosing this condition. Blood gases and Chest CT can help us in establishing the diagnosis of this condition. These patients are treated with heparin or enoxaparin and later maintained on warfarin pills. They need to be on warfarin for 6 to 12 months depending on the extent of blood clots.

Stroke: The blood clots in the left side of the heart could travel via the arterial system and block a tiny artery in the brain and cause a stroke. Bleeding inside the brain also could cause a similar stroke. Hence, an accurate diagnosis is very important as the treatment for a blood clot could be different from the treatment for a stroke resulting from bleeding. If a person has a clot, it is treated with standard blood thinners while patients with bleeding should not receive any blood thinners. The diagnosis of stroke is usually established with the help of a head CT. People diagnosed of having stroke related to a blood clot respond well to clot buster medicine such as tissue plasminogen activator which dissolves the clot.

Ischemic Leg: Sometimes a blood clot in the heart can travel to the legs and cause a blue leg resulting from total blockage. There will be no pulse beyond the blockage. It is usually a bedside diagnosis. It can also be confirmed with ultrasound and CT angiography. The leg may be pale, and cold. It is a surgical emergency. The clot has to be removed and then the patient is started on blood thinners.

Intestinal Ischemia: When the blood clots from the heart blocks one of the small branches in the arteries supplying the intestines, it results in gangrene. It usually happens in patients with multiple medical problems in a hospital. It is usually diagnosed by an abdominal CT. the treatment is surgical intervention. Using blood thinners in these complicated patients could be challenging. We have to weigh the advantages versus the risks of further emboli.

Heart Valves: People with artificial heart valves are also at risk of developing blood clots on the valves. Hence, these patients are generally maintained on lifelong blood thinners unless they receive a tissue valve which has a lesser tendency to bleed. They also need monitoring of their blood to determine the effect of blood thinners.

Coronary Stents: Just like the heart valves the coronary stents are foreign objects and hence they activate the clotting mechanism. Hence, all patients are placed on blood thinners after a stent placement.

What is a blood thinner?

A blood thinner acts on the coagulation system to increase the time it takes for the blood to form a clot. By prolonging the blood clotting time, the blood thinner prevents new blood clot formation. Aspirin is a

weak blood thinner. Plavix is another pill that prevents blood clot formation after coronary stent placement.

In an acute setting in the hospital patients receive heparin or enoxaparin as the initial blood thinner. Later, they are placed on warfarin which is an oral blood thinner. All blood thinner have a tendency to make the blood too thin to a point where they can bleed internally. We all have come across people who have bled in the belly or brain as a result of too thin blood. Hence, we have to measure the blood thinning effect and maintain it between 2.0 to 2.5 times the normal for people with venous blood clots and between 2.5 to 3.0 for people with heart valves. We also use the International Ratio [INR] to measure the blood thinning. Currently, we can do these measurements in our offices.

How to prevent blood clots?

Prevention of blood clots is a major health initiative undertaken in the hospitals. The patients are mobilized early, started on blood thinners such as enoxaparin for prophylaxis, engaged in physical therapy to increase activities, and encouraged to use elastic stocking for the legs. People who are on a plane for long hours or those who are bed ridden at home can use the similar techniques. Especially, those who travel long distance should exercise their legs every few hours at the ankle and knee joint level and move around every few hours to prevent blood clot formation.

Disclosure: The information provided during the "health-Talk," is for educational purpose only. Please consult with your physician for any medical advice.

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