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Heart to Heart Talk

With Philip S. Chua, M.D.

Blood Clots

What are blood clots?

Blood clots are hardened or solid blood, resulting from coagulation of blood. When blood is extracted and left alone on any surface for a few minutes, with no chemical additive that prevents clotting, it changes its state from liquid to solid.

Why do clots form in the body?

Blood in the body is in the liquid form, circulating efficiently inside the veins and arteries, providing essential nutrients and oxygen to tissues and organs in the entire body. Blood has to be in a normal dynamic motion. When the flow is slowed down, for whatever reason, the blood thickens and clots. Blood clots are caused by one or a combination of factors, like idiopathic (cause unknown; some people are more prone to form blood clots than others), smoking, stress, high cholesterol, dehydration, stress, varicose veins, lack of physical exercise, a bedridden state (following surgery or from chronic illness), and pregnancy, with the enlarged uterus compressing the large veins, slowing down the flow and causing clots. Cancer also makes the patient more prone to blood clots.

What keeps blood fluid in the body?

Blood remains in liquid form in our circulation because our body has built-in “anti-clot” enzymes and the arteries and veins have inner wall linings that are smooth and have properties that discourage clot formation. As long as the person has no medical condition, or adverse environmental factors affecting him, that could tilt the “natural balance” in the individual’s homeostasis, this protective enzyme system will keep the blood in liquid form. If enough of the adverse factors prevail, then clots form.

What is a thrombus?

A thrombus is a blood clot that forms inside the wall of a vein, an artery or within the chamber of the heart, and remains attached thereon.

What is an embolus?

An embolus is a blood clot or a piece of cholesterol plaque (hardened fats) that gets dislodged from its original location in the blood vessel or heart and travels to a more distant (smaller caliber) part of the circulation, blocking and interrupting blood flow. So, when a thrombus breaks off and flows with the circulation, it is called an embolus. Example: a blood clot in the legs traveling to the lungs, causing Pulmonary Embolus, resulting in shortness of breath, chest pains, which could be fatal; or, a piece of plaque or clot in the carotid (neck) artery, traveling to and blocking the cerebral (brain) artery, leading to a stroke; or, a piece of plaque tearing off from the abdominal aorta (largest artery in the abdomen), traveling to the smaller lower leg artery, blocking the circulation to the leg, causing gangrene.

What is the source of emboli?

Emboli usually come from inside the arteries, veins or even from within the heart chamber, usually the left atrium. Patients with atrial fibrillation (irregular heart rhythm due to quivering of the atrium) are more prone to develop clots inside the left atrium. This could embolize (travel) to the brain and cause stroke.

What is fat embolus?

As the term suggests, this is a piece of fat, or clumps thereof, that somehow gets into the blood circulation (where normally it should not be) and travels and blocks smaller blood vessels, causing obstruction of blood supply, and many times, death. Fat embolus is the most feared, and usually fatal, complication of liposuction.

What about tumor embolus?

Tumor embolus is a piece of cancerous tissue that breaks off from the cancer-ravaged organ (like in cancer of the pancreas or liver) and gets into the circulation and travels with the blood flow. The cancer cells are then implanted on the “recipient” tissue or organ, supplied with that blood.

How about air embolus?

Air embolus is usually from the air inside a bottle or plastic bag of blood or intravenous fluid that accidentally gets transfused to a patient. A little air is well-tolerated by the body, but nonetheless, the fluid to be transfused is always allowed to fill the IV tubing all the way down to the needle, to get rid of all air, before

hooking this to the patient. A large air embolus can cause the same blockage to the circulation as clots or plaques.

What is amniotic fluid embolism?

Fortunately a very rare condition, amniotic fluid embolism happens to pregnant women, usually among those with difficult labor and ruptured bag of water. The amniotic fluid inside the womb somehow gets into the venous circulation and travels to the lungs, causing fall in blood pressure, shock and death.

Does phlebitis lead to clot formation?

Yes, phlebitis (inflammation of the vein) that cause pain and swelling of the leg, often leads to thrombophlebitis (inflammation with clots). The frequent sites of this are the pelvic veins and the leg veins. This is common among those with varicose veins in the legs, where the walls of the veins become thinned out and ballooned out, losing its normal elasticity. Part of the prophylactic regimen here is the use of support stockings when walking, and whenever not ambulating, to elevate the legs as high as possible. This helps stagnant blood in the varicose veins to flow back to the heart and lungs (for oxygenation) more efficiently.

Does diarrhea make one prone to blood clots?

Yes, loose bowel movements or any situation that leads to dehydration increases the chances of blood clot formation, especially among smokers and those with high blood cholesterol. When the body's water content is reduced by diarrhea or excessive sweating, the blood becomes more concentrated and thickens. This invites clot formation. Hence, fluid replacement is very important. We should actually drink at least 8 tall glasses of water daily.

How does smoking lead to blood clots?

Besides the direct harmful chemical effects of smoking has on our breathing pipe and lungs (causing cancer), smoking also makes the blood thicker (leading to heart attack and stroke). Smokers have thicker blood. And so with people who eat red meats and eggs. People with hypercholesterolemia (high serum cholesterol) has been shown to have thicker blood, milkier serum.

Do birth control pills thicken blood?

Yes, it is a well-known fact that the incidence of thrombophlebitis is about 3-4 times higher among women who take birth control pills. Oral

contraceptive pills appear to increase platelet adhesiveness and other clotting factors, making the blood thicker and more prone to clotting.

How can blood clots be prevented?

For the otherwise healthy person, the following strategy is most helpful: (1) cessation or abstinence from smoking; (2) good hydration by drinking 8 glasses of water, milk, juices, other non-alcoholic fluids, a day; (3) physical exercise, like walking (brisk, if tolerated), ballroom dancing, tai chi, tai bo, swimming, etc. for about 30 minutes to one hour a day, at least five times a week; (4) low-fat diet consisting of fish, vegetables, fruits and other hi-fiber foods, in lieu of red meats and eggs; (5) learning how to manage stress, relax and enjoy life. For those with medical conditions, like diabetes, hypertension (high blood pressure), hypercholesterolemia (high serum cholesterol), varicose veins, etc., or those taking drugs, like birth control pills, diet pills, aspirin (to thin the blood and prevent blood clots), etc, must be under a physician's care. To a great extent, and in most cases, the formation of blood clots is preventable.