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### A "Breakthrough" Case: 16-Year-Old Male Who Develops Recurrent DVT While on Prophylactic Anticoagulation

#### Announcer:

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#### Dr. Raffini:

Hello, this is Leslie Raffini, and I'm a pediatric hematologist for the Children's Hospital of Philadelphia. This topic is a breakthrough case. So this is a 16-year-old male who develops recurrent thrombosis while on prophylactic anticoagulation. His history is as follows. He's generally a healthy male with no chronic medical conditions. At age eight, he fractured his left ankle after falling off his bike, and two weeks later, was diagnosed with a left calf vein thrombosis. His family history is notable for a father who developed a deep vein thrombosis at age 35 after an international flight. A thrombophilia evaluation in this boy, given the fact that his age is a little unusual as is a family history, reveals a protein S activity of 27%. That is repeated and confirmed. So he's treated for three months of therapy with enoxaparin for this provoked calf vein thrombosis and does well.

At age 16, he falls while downhill skiing and sustains a left tibial-fibular fracture. And he's gonna be non-weight bearing with a cast for several weeks. Given his prior history, he's placed on prophylactic enoxaparin 30 milligrams twice a day. He is nearly 150 pounds. New in the family history is that his father recently developed a near-fatal pulmonary embolism and is now on indefinite anticoagulation with apixaban. So after six weeks of twice daily prophylaxis, the family's very reluctant to discontinue his anticoagulation given the father's recent scare. So they elect to continue once a day enoxaparin 40 milligrams for prophylaxis, which he can give himself after soccer practice. Six months later, while on this regimen, he comes in with a new right lower extremity deep vein thrombosis.

His mother thinks he may have missed a few doses. He certainly didn't like the shots, and he was responsible for giving them to himself. So what are the treatment options for this boy with new unprovoked DVT, a history of prior DVT and protein S deficiency? So the acute options include: increasing his enoxaparin to full dose and then switching him to a DOAC the following week, both rivaroxaban and dabigatran are now approved for use in pediatric patients with acute VTE, but both approved only after five days of a parental anticoagulant. Or would you consider using an adult regimen and switching him directly to a DOAC? This would be off label, but I think reasonable for a patient who's over 50 kilos. Or you could consider enoxaparin full dose followed by a transition to warfarin, but I think this regimen is certainly falling out of favor. So you decide to switch him straight to a DOAC using one of the adult regimens, which would probably be either apixaban or rivaroxaban.

He's treated with rivaroxaban twice daily for three weeks followed by 20 milligrams once daily, which is an easier regimen for most patients compared to a twice daily regimen. And then at three months, he has no further pain or swelling and now you have the discussion about how long should he be treated. So there's very little data on treatment duration for recurrent DVT in pediatric cohorts, but this thrombus was unprovoked and this is his second event. Those two pieces of information would support indefinite anticoagulation in my opinion, certainly would in an adult population. Once a day DOAC, I think, is a fairly feasible option for indefinite anticoagulation. And he can continue to play soccer on this with some precautions. I think there might be the option to decrease his dose to a

prophylactic dose in the future with the understanding that he certainly needs to take it. And I would follow him in my clinic every six months and assess adherence and risk factors for bleeding.

So, in summary, pediatric patients with unprovoked thrombosis and strong inherited thrombophilias are at high risk of recurrence, probably greater than 25% based on the data that we have in the pediatric population. And DOACs can provide an option for extended thromboprophylaxis that is likely safer and more practical for patients than traditional anticoagulants. Thank you for your attention.

**Announcer:**

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