

Anatomy of an Embolus

Until early last week, Richard Nixon's troubles with blood clots seemed confined to his sometimes painfully swollen left leg. The announcement that a clot had evidently passed through his heart and lodged in his right lung suggested that his life may indeed have been imperiled by his condition, if only momentarily. But the presence of such obstructions in the bloodstream is far more common than was generally realized only a few years ago and it is now evident that in only relatively few cases are they truly dangerous.

Nixon has been troubled by phlebitis—inflammation of a vein or veins—in his left leg on and off for ten years. In such cases, the medical problems begin with the valves in the veins that serve to keep blood flowing back to the heart. When these valves become inflamed—it may be from injury, infection, some forms of cancer or simply sluggish blood flow from inactivity—some blood is likely to be trapped in a pocket where it forms a clot. The danger then is that the clot, or thrombus, will begin to travel toward the heart and lungs.

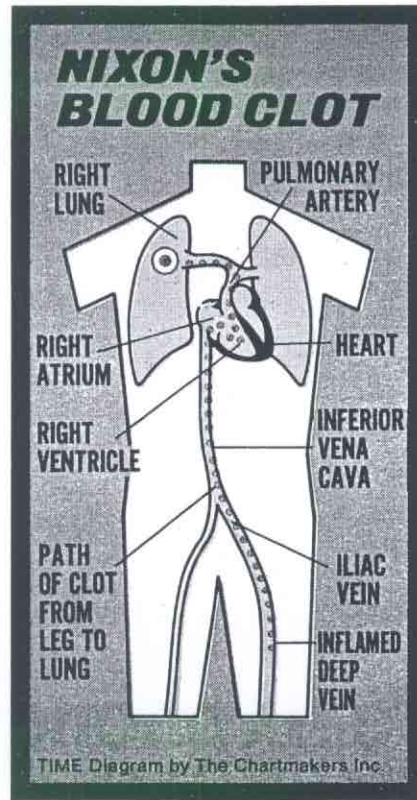
Deeper Danger. When a thrombus does travel, it is called an embolus. The likelihood of an embolus appearing is negligible when the inflamed vein is near the skin's surface; it is vastly greater, however, if the clot forms in one of the large, deep veins. That is what apparently happened in Nixon's case. For some time after its formation in a vein deep in his left leg, the clot stayed in place. There, it caused the intermittent but painful swelling that bothered Nixon on his trip to the Middle East last June and, more severely, during his five-day stay at the Annenberg estate in Palm Springs early in September. At some point, Nixon's physicians say, a part of that clot, or possibly a new one, broke loose. The embolus was carried away in the bloodstream, like debris in a fast-flowing river, through the iliac vein and the inferior vena cava into the heart (see diagram).

The next move was potentially the most dangerous: if the clot had been as big as the end of a man's thumb, as some are, it could have caused a complete blockage of the great artery through which blood is pumped from the heart to the lungs. The result would have been a dramatic collapse of the patient and perhaps sudden death. Smaller clots usually produce only minor local lung damage.

Nixon's lung clot was evidently a small one—only "dime-size," speculated Dr. John Lungren, the ex-President's internist. Lungren and Radiologist Earl K. Dore discovered the clot through two recently refined tests using radioactive isotopes. First they injected human albu-

men tagged with radioactive iodine-131 or technetium into an arm vein. The radiant particles circulated through the small blood vessels of Nixon's lungs, and a scintillation scanner took an electronic "picture" of their distribution. Nixon's scan showed a blank area on the outer side of the right lung: the clot had settled there in a small artery, leaving an area of dead tissue where no blood is circulated to take up oxygen. Then the doctors ran a second test to determine whether Nixon's respiratory passages were open to this area and thus rule out any other lung disease. For this, Nixon inhaled an aerosol containing radioactive technetium. This time the scanner showed no obstruction.

Lungren prescribed the anticoagu-



lants heparin (which must be injected) and Coumadin (taken by mouth) to prevent the formation of new clots. But the anticoagulants have little if any ability to dissolve existing clots. Given time, the human bloodstream will usually clear out clot debris on its own.

Some doctors suggested that Nixon's clot might be an old one that adhered to the lung wall some time ago. In that case, he would no longer need the heparin drip treatment. Lungren conceded that in any event, the clot was not causing pain or making it difficult for Nixon to breathe. The doctor explained that "it is not unusual to have a 'silent' clot"—meaning one that produces no symptoms.