

Heparin-Induced Priapism

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Several cases of priapism possibly associated with heparin therapy have been reported in the literature.¹⁻⁴ Failure to treat priapism promptly usually results in fibrosis,⁵ and prolonged priapism has led to permanent loss of erectile function or even amputation.^{1,2} We report a case of successful attenuation of priapism after discontinuation of heparin therapy.

On April 6, 1999, a 42-year-old man was admitted with a 10-day history of pain and swelling of the right lower leg. Deep venous thrombosis of the left leg had first developed 4 years previously, after the patient was hit by a hockey puck, and over the past 3½ years he had experienced recurrent episodes of superficial venous phlebitis.

Medical assessment on admission and duplex Doppler examination confirmed a large deep venous thrombosis of the right leg. Intravenous infusion of heparin (800 U/h) was started immediately, and warfarin therapy was started on day 4. On day 8 of heparin infusion, the patient awoke with priapism. The penile pain at 3 h was so severe that even the bed sheets caused extreme discomfort. The patient was given a "stat" 10-mg subcutaneous dose of morphine. We immediately discontinued the heparin therapy on the basis of several reports of heparin-associated priapism and because the patient's anticoagulation had been effective for 48 h (international normalized ratio 2.9; activated partial thromboplastin time 65). Two hours after discontinuation of the heparin, the erection gradually subsided, and by the evening there was minimal swelling and pain. The patient was subsequently discharged from the hospital. At follow-up 1 week later, the patient had normal erectile function.

The occurrence of priapism in patients receiving heparin remains uncommon, and the mechanisms by which heparin may induce priapism remain largely

unknown. It has been postulated that heparin-induced priapism may be related to vasodilation or hypercoagulability (or both).^{1,6,7} Conceivably, both of these effects could promote and prolong erection. The hypercoagulability hypothesis is supported by several observations. Studies during cardiac bypass have shown that traumatized blood is hypercoagulable.⁸ During erection, the corpora contain blood under extremely high pressure, which might cause trauma to the blood elements and consequent hypercoagulability. A "rebound phenomenon" of hypercoagulation exists when an anticoagulant is abruptly discontinued, and small doses of heparin, in contrast to large doses, actually enhance thrombosis.^{1,9-11} A thrombus-enhancing effect of a low heparin level may promote thrombosis and priapism.² Protein C deficiency has recently been implicated in giving rise to a transient hypercoagulable effect and the induction of priapism during anticoagulant therapy.¹² Heparin-induced immune aggregation of platelets in patients who have received heparin on several occasions has been described.^{13,14} Other studies suggest that heparin promotes the development of clots formed predominantly from platelets ("white thrombus"), in contrast to those formed in less rapidly moving blood, in which red blood cells predominate ("red thrombus").^{1,2}

Because our patient had no identifiable risk factor to explain his priapism, we believe that it may have been induced by a hypercoagulability mechanism associated with the formation of platelet aggregates, which impaired normal venous outflow from the penis. The hypercoagulability could have been caused by the presence of a heparin-dependent IgG platelet-aggregating antibody.^{13,14} The consequences of immune-mediated processes usually occur, on average, 5 to 9 days after initiation of therapy,¹⁴ which coincides with the time of development of priapism in this case (day 8). Interestingly, this patient experienced priapism while

receiving heparin therapy. This is unusual, in that other reports have described the onset of priapism after discontinuation of heparin.^{2,15}

The treatment of priapism remains largely surgical, but diphenhydramine, trazodone, cyproheptadine, and benzotropine have been used with various degrees of success.¹⁶ Our experience demonstrates that close monitoring of patients receiving heparin therapy and prompt discontinuation of the therapy can provide an alternative to surgical and pharmaceutical intervention. For our patient, future anticoagulant therapy, besides warfarin, could include intravenous danaparoid. Danaparoid has been successful in patients with heparin-induced thrombocytopenia.

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