



# Potential Damages of Limb Tourniquet Application to Stop Bleeding in Vascular Injury

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## Case Blog

Trauma patients are the major part of the admissions to the emergency department. Depending on the traumatized area of the body or the severity of the trauma, pathological processes that affect the vital functions may occur. Patients with vascular injuries especially after trauma are exposed to lower extremity ischemia due to the tourniquet applications performed before the surgery and arterial clamping during the surgery. The pathological results of ischemia are evident. But what we want to mention here is the Ischemia Reperfusion (IR) damage caused by elimination of ischemia. Ischemia-reperfusion injury, skeletal muscle injury, and associated secondary end organ damage can occur following revascularization of a limb following prolonged tourniquet-induced ischemia [1]. The main mechanism that initiates IR injury is the activation of the inflammatory response. Activation of these inflammatory responses systemically often lead to a complex cytokine cascade or storm that serves to perpetuate inflammatory reactions in remote organs, which can clinically manifest as multiple organ dysfunction (acute liver injury and acute lung injury) [1-3]. The reperfusion injury of the post-IR distant organ, which was formed in the lower extremity, has been shown experimentally in many studies [1-4]. However, in a more common practice, IR is often created in a specific organ and the reperfusion injury that occurs in the same organ is examined [5-7]. For example, reperfusion injury in liver tissue can be examined both after IR injury in the lower extremity and after IR injury in the liver specifically [1,3,7]. However, there is no study investigating whether the liver tissue has more damage with the lower extremity IR injury or the specific IR injury of the liver. If it can be shown that the lower extremity IR injury is associated with liver damage as much as specific liver IR injury; after tourniquet applications especially in emergency services or after reperfusion surgery for vascular injuries, we can have more information about not only the relevant limbs, but also the other distant organs are how much affected. And we can develop our treatment strategies accordingly.

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