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## **COMPLICATIONS OF LONG BONE FRACTURES IN TRAUMA PATIENTS**

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Trauma patients frequently have long bone fractures, which are usually brought on by high energy events like falls and auto accidents. These fractures, affecting the femur, tibia, humerus, and forearm bones, are associated with a variety of complications that significantly impact patient outcomes. The literature broadly classifies these complications into early and late categories.

Early complications occur within hours to days after injury and may be life threatening. Hemorrhage is a major concern, particularly in femoral fractures, where significant blood loss can lead to hypovolemic shock. Fat embolism syndrome is another serious complication, usually developing within 24-72 hours, and is characterized by respiratory distress and neurological symptoms. Increased pressure inside muscle compartments causes compartment syndrome, a surgical emergency that could result in tissue necrosis if left untreated. Additionally, trauma patients are more vulnerable to venous thromboembolism, including pulmonary embolism and deep vein thrombosis, particularly if they are immobilized for an extended period of time. In open fractures, early infection is a frequent complication that can complicate healing.

Late complications develop during the healing phase and may lead to long-term disability. Delayed union and nonunion are common and often result from inadequate stabilization, poor vascular supply, or infection. Deformity and functional impairment can result from malunion, which occurs when the bone heals in an incorrect position. Avascular necrosis may occur in fractures that disrupt blood supply, particularly in the femoral region. Chronic infection, including osteomyelitis, remains a significant challenge and may require prolonged treatment. Other complications include heterotopic ossification and chronic pain syndromes.

In addition to physical effects, long bone fractures have important psychosocial and economic consequences. Patients often experience prolonged recovery, limited mobility, and difficulty returning to work. Psychological impacts such as anxiety and depression are also reported.

In conclusion, complications of long bone fractures in trauma patients are diverse and can affect both short- and long-term outcomes. Early recognition and management, along with a multidisciplinary approach, are essential to improve recovery and reduce complications.

In conclusion, complications of long bone fractures in trauma patients are diverse and can significantly affect both short- and long-term outcomes. Early identification and management of acute complications, along with prevention and treatment of delayed complications, are essential for improving prognosis. A multidisciplinary approach involving surgical care, rehabilitation, and psychological support is critical to optimizing patient recovery and reducing the overall burden of these injuries.