

# Expert opinion: diabetic ankle fracture

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## Opinion

Diabetic patients sustaining ankle fractures are at an increased risk for several complications. One of the most difficult and frequently missed aspects of diabetic ankle fractures is the distinction between a simple ankle fracture and what is actually a Charcot ankle. The loss of sensation in diabetic neuropathy is one of the largest risk factors for the development of Charcot ankle and may initially present similar to an ankle fracture. The diagnosis of Charcot ankle may be missed and subsequently lead to an unfavorable outcome, such as amputation. This also brings forth the importance of detailed and adequate foot and ankle examination of the diabetic patient, checking for pulses, overall circulation and sensation.

The most alarming aspect of diabetic ankle fractures is the increased rate of complication, which approaches 40%. Amputation rates are approximately 6% for closed injuries and 40% for open injuries. The most significant complication in diabetic patients with ankle fractures is the risk of superficial and deep wound infections. In diabetic patients with ankle fractures, elevated HbA1C levels greater than 6.5% appear to be predictive of higher complication rates in those receiving surgical treatment.<sup>1</sup> This also establishes the importance of tight blood glucose control preoperatively and postoperatively. Additionally, peripheral neuropathy serves as a significant risk factor for post-operative complications. When treating fractures in patients with peripheral neuropathy, the use of a splint or a cast must have extra padding around bony prominences and areas of dependence in order to avoid ulcers, skin breakdown and complications.

The second most important complication of diabetic ankle fractures is prolonged bone healing. There is a higher incidence of nonunion, malunion, and hardware failures. It is important that the diabetic patient with an ankle fracture be non-weight bearing for a longer period of time than non-diabetic patients. Longer non-weight bearing periods will allow for appropriate wound healing and a decreased incidence of nonunion, malunion and hardware failure. The duration of non-weight bearing periods for diabetic patients should be roughly twice that of non-diabetic patients.

Surgical treatment is preferred for this patient population. Diabetic patients will have prolonged healing times; therefore, it is important to establish a stable fixation. This will most likely require nontraditional fixation. Methods may include the use of additional syndesmotic screws, fixation between the fibula and tibia, a spanning external fixator, or the use of K-wires to create stable fixation between the calcaneus to the tibia. Minimally invasive surgical techniques have shown ideal outcomes within this patient population. Avoidance of

opening the fracture site but rather the use of percutaneous incisions will decrease the size of surgical exposure and aid in the decreasing the rate of infection. This technique is performed frequently at our institution. We begin by restoring the anatomic fibular length then proceed to fix the medial malleolus percutaneously. If syndesmosis injuries are present, percutaneous methods may also be used for fixation. Again, this allows for the least amount of incision with the greatest amount of stability.<sup>1</sup>

## Conclusion

The management of diabetic ankle fractures is difficult due to increased rates of complications such as infection and delayed bone healing. With the use of a minimally invasive, stable surgical fixation along with delayed weight bearing, better healing and clinical outcomes can be achieved.

## Acknowledgments

None.

## Conflicts of interest

None.

## References

1. Liu J, Ludwig T, Ebraheim NA Effect of the blood HbA1c level on surgical treatment outcomes of diabetics with ankle fractures. *Orthop Surg.* 2013;5(3):203–208 .