

3.7d Recommendation

We recommend a referral for psychological support following a lower extremity fracture in patients with an SCI and a propensity for depression, anxiety, or posttraumatic stress or poor coping strategies (catastrophic thinking and low self-efficacy)³⁰.

Grade: 1C

3.7e Recommendation

We recommend that, when selecting post-fracture pain management therapy, clinicians consider the individual's risk of pain management misuse and monitor for substance use behaviors and psychological indicators during therapy.

Grade: 1C

3.7f Recommendation

We recommend that clinicians pay as much attention to the initiation of analgesic medications as to the tapering and discontinuation of these medications during or after fracture-healing.

Grade: 1C

Conclusions

The role of surgical treatment of fractures in patients with an SCI continues to evolve with our understanding of the role of skeletal stability in improved post-injury mobilization. Surgical treatment precludes external immobilization and allows patients to quickly return to their pre-fracture state. Surgical treatment decreases the rate of pressure injuries and joint stiffness associated with nonoperative treatment while improving wheelchair sitting balance^{10,13,31}. Concerns about the rate of surgical complications have merit³², but, as surgical techniques and implant technology improve, the safe surgical treatment of lower extremity fractures in patients with an SCI may become more widely adopted.

Challenges associated with operative treatment and the reluctance to operate on patients with an SCI are in part due to atrophic soft tissues and osteopenia^{33,34}. Locked plating, intramedullary nailing, and circular external fixation technology have increased surgical options^{35,36}.

More rigid fixation may allow for early unrestricted range of motion in persons with chronic SCI without increasing overall complication rates. It is possible that improved fracture stability after surgical management may lead to a reduction in nonunion/malunion rates³⁷ and allow early return to function, but studies in this area are needed.

These specific surgical recommendations for lower extremity fractures in patients with an SCI were informed by evidence from the able-bodied population. However, the application of fracture principles used when treating able-bodied persons with osteoporosis may be considered when surgically treating fractures in patients with an SCI. Load-sharing constructs are preferable for providing biomechanical stability, and augmenting fixation should be considered to prevent early fixation failure. Also, the use of modalities to accelerate/augment fracture-healing should be considered for fractures with a high nonunion risk. The 1 exception to this concept is in cases

of foot/ankle fractures. The advent of EAW brought to attention the fact that individuals with an SCI have a predisposition to fractures of the foot and ankle³⁸. Fractures of the calcaneus³⁹ and talus³⁸ have been reported following EAW. This is at least in part due to the rapid demineralization that occurs with immobilization in these predominantly trabecular bone sites^{40,41}. Thus, one should avoid early weight-bearing activities after healing of the fracture because of the high risk of refracture with upright activities.

We are not aware of any study that has compared different surgical procedures for lower extremity fractures in patients with an SCI. Favorable techniques focus on immediate stability and are minimally invasive^{10,42,43}. In small case series, these techniques have produced acceptable outcomes when used for the treatment of fractures of the femur and tibia^{34,44}. Further comparative studies are needed to confirm these recommended techniques, but the principles of soft-tissue-friendly but biomechanically sound surgical treatment are highlighted by the recommendations in this document.

Patients with an SCI and an acute lower extremity fracture should be provided with education regarding the risks and benefits of operative and nonoperative management. Shared decision-making for fracture management should be used, the same as with all patients⁴⁵. Nonoperative management has historically been the default treatment preference; however, with the advent of greater patient independence, improved surgical techniques, and advanced therapeutics and rehabilitation, the increased use of surgical management should be considered. Surgical treatment can prevent complications (e.g., pressure injuries, nonunions, and malalignment) that can negatively impact independence. Early consultation with physiatrists, physical therapists, and endocrinologists can help to optimize treatment and outcomes. Given the increased risk of fracture nonunion in patients with an SCI, consideration of bone-healing adjuvants may be considered. Prevention of thrombosis and consideration of post-fracture pain control are necessary.

Appendix

eA Supporting material provided by the authors is posted with the online version of this article as a data supplement at [jbjs.org \(http://links.lww.com/JBJSOA/A445\)](http://links.lww.com/JBJSOA/A445). ■

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