

# Fibula Nerve Neuroplasty and Osteoplasty for Limb Length Discrepancy: A Case Report

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# Disclosure

I have no financial disclosure or conflicts of interest with the material presented in this presentation.

# Background

- Soft tissue injury is often prioritized before boney injury in order to salvage the extremity.
- This can cause a delay in treatment of boney or ligament injuries

# Background

- Modern techniques allow salvage and reconstruction of catastrophic limb injuries
- However, well- functioning lower extremity prostheses have good functional outcomes, when compared to prostheses.
- The Lower Extremity Assessment Project (LEAP) study showed that social factors were more closely associated with outcome vs. treatment strategy.

# Case Report

## Patient History

- 22 y/o Male
- Helmeted MCC vs. ambulance
- Mangled left leg extremity with an open proximal tibia fracture, soft tissue damage with approximately 150cm of intact skin anterolaterally.
- No palpable or dopperable detected dorsalis pedis and posterior tibial pulse



# Case Report

- I&D, fasciotomy of the left lateral compartment, and placement of uniplanar external fixator.
- Amputation recommend but referred to our practice for limb salvage.
- Patient underwent gradual shortening of approximately 17cm to allow for soft tissue coverage.



# Case Report

- Returned 1.5 years later
  - Neurogenic pain
    - Burning, tingling, electric
  - X-Ray negative
  - Foot drop

# Case Report

- Returned a few months later
  - Increased pain over fibula
  - Foot drop persisted, despite adhering to the brace
- BKA vs Excision of fibula

# Case Report

- Reported back a few months later
  - Needed shoe lift for LLD
  - Still considering amputation vs. excision vs. limb lengthening



# Case Report

- First underwent excision of the fibula and neuroplasty of the fibula nerve.
  - Fibula nerve placed more favorably anteriorly
  - Fibula was dissected out and excised
  - Made WBAT and ROM as tolerated

# Case Report

- Returned four months later
  - Removal of hardware
  - Osteoplasty of the tibia/fibula
  - Placement of PRECICE nail
  - Touch-down weightbearing and ROM as tolerated

# Case Report

- Seen two weeks post-operatively
  - External remote control (ERC) adjustment device provided, and training was performed to do adjustments at home
- Follow-up biweekly with x-rays
- Discontinued ERC at four months post-op
- Six months post-op the left tibia was 5mm shorter than contralateral side
  - Consistent with pre-operative plan

# Discussion

- Proximal tibiofibular joint dislocations are a rare finding and are often reported with impact collisions. They can present with lateral leg pain and a foot drop.
- Peroneal nerve entrapment syndrome is a common neuropathy of the lower extremity associated with foot drop and pain. Treatment is typically required to help alleviate symptoms and can include decompression or proximal fibular excision.
- LLD has multiple etiologies, including bone loss from open fractures.
- Osteoplasty with a PRECICE nail has been shown to be a valid option to achieve limb lengthening treatment for patients with length discrepancy.

# Discussion

- Overall, the patient benefited significantly from a proximal peroneal nerve excision and a PRECICE nail and has returned to all daily activities.



# References

1. Qureshi MK, Ghaffar A, Tak S, Khaled A. Limb Salvage Versus Amputation: A Review of the Current Evidence. *Cureus*. 2020 Aug 28;12(8):e10092. doi: 10.7759/cureus.10092.
2. Patel, M.B., Richter, K.M. & Shafi, S. Mangled Extremity: Amputation Versus Salvage. *Curr Trauma Rep* 1, 45–49 (2015).
3. Higgins TF, Klatt JB, Beals TC. Lower Extremity Assessment Project (LEAP)--the best available evidence on limb-threatening lower extremity trauma. *Orthop Clin North Am*. 2010 Apr;41(2):233-9. doi: 10.1016/j.ocl.2009.12.006.
4. Horan J, Quin G. Proximal tibiofibular dislocation. *Emerg Med J*. 2006 May;23(5):e33. doi: 10.1136/emj.2005.032144.
5. Martin B, Corbett J, Littlewood A, Clifton R. Proximal tibiofibular dislocation: a case report of this often overlooked injury. *BJR Case Rep*. 2016 Jul 28;2(3):20150372. doi: 10.1259/bjrcr.20150372.
6. Fortier LM, Markel M, Thomas BG, Sherman WF, Thomas BH, Kaye AD. An Update on Peroneal Nerve Entrapment and Neuropathy. *Orthop Rev (Pavia)*. 2021 Jun 19;13(2):24937. doi: 10.52965/001c.24937.
7. Maalla R, Youssef M, Ben Lassoued N, Sebai MA, Essadam H. Peroneal nerve entrapment at the fibular head: outcomes of neurolysis. *Orthop Traumatol Surg Res*. 2013 Oct;99(6):719-22. doi: 10.1016/j.otsr.2013.05.004. Epub 2013 Aug 27.
8. Kirane YM, Fragomen AT, Rozbruch SR. Precision of the PRECICE internal bone lengthening nail. *Clin Orthop Relat Res*. 2014 Dec;472(12):3869-78. doi: 10.1007/s11999-014-3575-0.
9. Cosic F, Edwards E. PRECICE intramedullary nail in the treatment of adult leg length discrepancy. *Injury*. 2020 Apr;51(4):1091-1096. doi: 10.1016/j.injury.2020.03.004. Epub 2020 Mar 2.
10. Kariksiz M, Karakoyun O. Limb lengthening with one Precice nail over its capacity. *Saudi Med J*. 2019 Oct;40(10):1058-1062. doi: 10.15537/mj.2019.10.24019.
11. MacKenzie EJ, Bosse MJ. Factors influencing outcome following limb-threatening lower limb trauma: lessons learned from the Lower Extremity Assessment Project (LEAP). *J Am Acad Orthop Surg*. 2006;14(10 Spec No.):S205-10. doi: 10.5435/00124635-200600001-00044.