## Accuracy of Ultrasound and MRI in the Diagnosis of Common Peroneal Nerve Injuries

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## INTRODUCTION:

Treatment and prognosis after common peroneal nerve (CPN) injuries are highly dependent on the extent of the nerve injury, whether it is in continuity or transected (i.e, whether neuroma-in continuity or stump neuroma is present). Advanced imaging is obtained after a thorough history and physical examination to confirm the diagnosis, localize, and grade the injury. This study aimed to determine the accuracy of ultrasound (US) and magnetic resonance imaging (MRI) compared to the intraoperative findings in patients who underwent surgery for their CPN injury. METHODS:

Patients who underwent surgical management of a CPN injury between 2001 and 2020 were reviewed. Only those with preoperative US were included in this study. Demographic information, as well as the status of the CPN as interpreted by the musculoskeletal radiologist in the preoperative US and MRI, were recorded. Operative reports were reviewed, and the intraoperative findings of the CPN were compared to the previously reported US and MRI imaging findings. The CPN was classified as intact, a partial transection, or a complete transection, and the location of the injury was also recorded. Imaging and intraoperative reports were also reviewed to determine whether a neuroma-in-continuity or stump neuroma was present. The sensitivity and specificity of US for accurate diagnosis of a complete CPN transection and an intact CPN were calculated.

## RESULTS:

Thirteen patients who underwent surgical intervention of their CPN injury with preoperative US available were included in this study. Preoperative US accurately diagnosed a complete CPN transection in 3 out of 4 (75%) patients and an intact CPN in 4 out of 5 (80%) patients. MRI, which was also performed in 8 patients, did not accurately identify the status of the CPN in any of the patients examined. US had a 75% sensitivity and a 78% specificity for detecting complete CPN transection, and an 80% sensitivity and a 63% specificity for detecting an intact CPN. US correctly identified the level of injury in 7 out of 13 (54%) cases, whereas MRI correctly identified the level of injury in 1 out of 8 (13%) cases. US correctly identified a neuroma-in-continuity or a stump neuroma in 7 of 11 (64%) cases, while MRI correctly identified the neuroma in only 1 out of 8 (13%) cases.

## DISCUSSION AND CONCLUSION:

US has a high sensitivity and specificity when diagnosing CPN lesions and was more accurate than MRI in this study. Surgeons should consider obtaining a US for any clinical suspicion of CPN injury to obtain a more accurate diagnosis, thereby improving prognostication and surgical decision-making in these injuries.