The role of ultrasound examination in penetrating nerve injuries

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Background / Objective:
- High resolution ultrasound is valuable recent addition in the diagnostic work-up of peripheral nerve disorders¹
- We assessed the role of high resolution ultrasound in penetrating nerve injuries before and after nerve reconstruction

Methods:
- Between 2016 and 2017, consecutive patients with complete or incomplete penetrating nerve injuries were included in the study prospectively (30 patients, 34 injured nerves)
- All patients underwent clinical, electrophysiological, and B-mode ultrasound examination, and color Doppler to assess intraneural vascularization
- The size of the scar / neuroma at the injury site was measured, and correlated with the degree of reinnervation where reconstruction was carried out and sufficient time has elapsed

Results:
- No significant correlation between the degree of reinnervation and the size of the scar / neuroma at the injury site
- Ultrasound has shown findings which prompted surgical intervention / revision, including unrecognized neurotmesis (Fig. 1), misalignment of the sutured stumps (Fig. 2), and suture neuroma
- Intraneural hypervascularization proximal to the injury site of all injured nerves (Fig. 3)²

Conclusions:
- Ultrasound may help in planning surgical intervention after penetrating nerve injury
- Hypervascularization of the nerves proximal to injury site appears to be an essential element of nerve regeneration after penetrating nerve injuries