Sensory Nerve Dysfunction after Hallux Valgus Correction: A Prospective Study

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Summary:
This prospective study on patients with hallux valgus, minimum 2 year follow-up, shows that preoperative sensory deficit exists, and can improve up to 24 months after surgical correction. This supports the concept that sensory deficit in hallux valgus is at least partially caused by a reversible injury to the sensory nerves, not necessarily a complication of surgery. These results highlight the need to document preoperative nerve deficits and to counsel patients about the expectations of surgery.

Introduction:
Sensory nerve dysfunction in patients with hallux valgus has been described as both a symptom of the deformity and a complication of the treatment. The purpose of this study was to quantify preoperative and postoperative nerve dysfunction in patients undergoing surgery for hallux valgus and to prospectively evaluate whether the trauma of surgery or the correction of the deformity had any effect on the sensory nerve function. Our hypothesis was that sensory nerve function would improve after correction of the hallux valgus deformity.

Methods:
Fifty seven consecutive feet in 51 patients undergoing surgical correction for hallux valgus were prospectively enrolled. A total of 48/57(84%) went on to complete 24 months of follow-up and were included. Seven were excluded for lack of follow-up, one never underwent surgery, and one underwent an alternative procedure. Preoperative and 3, 6 and 24 month postoperative clinical, radiographic, and detailed sensory examinations were completed. For the sensory examination, a Semmes-Weinstein 5.07 monofilament was used to establish, if present, a geometric area of sensory deficit about the hallux. This area was marked, carefully traced onto calibrated graphing paper, scanned, and processed with open source image processing software.

Results:
Preoperative sensory area deficit improved by a mean of 531 mm² at 24 month follow-up, see Figure 1. Mean preoperative sensory deficit area was 688mm²(SD 681 mm², range: 0 to 2885 mm²) and 24 month post-operative sensory deficit area was 159mm²(SD 329 mm², range: 0 to 1463 mm²). Mean AOFAS forefoot scores improved from 59 preoperatively to 89 at 24 month follow-up. Mean hallux valgus angle improved from 28 degrees preoperatively to 8 degrees at 24 month follow-up. One patient had recurrent deformity and went on to a first MTP fusion. Mean hallux valgus angle improved from 29 preoperatively to 9 degrees postoperatively. Mean 1-2 intermetatarsal angle improved from 15 degrees to 6 degrees.
**Conclusion:**
This prospective study shows that preoperative sensory deficit exists, and can improve up to 24 months after surgical correction of the hallux valgus deformity. This supports the concept that sensory deficit in hallux valgus is at least partially caused by a reversible injury to the sensory nerves, not necessarily a complication of surgery. These results highlight the need to document preoperative nerve deficits and to counsel patients about the expectations of surgery.