Combinations Following Total Versus Partial Digital Amputation

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STATEMENT OF PURPOSE

Partial and complete toe amputations are often performed secondary to infection, ischemia, and, more frequently, malformations and adjacent soft tissue break down. The purpose of this study was to assess outcomes following partial and complete toe amputation.

LITERATURE REVIEW

Previous literature has demonstrated acquired digital deformities1 and abnormal pressure distribution after a complete hallux amputation1 leading to the assumption that it is beneficial to preserve length. However, as seen with infection, the desire to restore optimal biomechanics must be reconciled with the likelihood of leaving diseased tissue intact. Despite thorough resection, as many as 41% of foot amputations retain osteomyelitis resulting in dehiscence, re-infection, re-amputation, and amputation.

To our knowledge, no study has investigated the effect of amputation at the inter-phalangeal joint compared to the metatarsal-phalangeal joint secondary to any pathology.

METHODOLOGY & PROCEDURES

- Inclusion Criteria: Index procedure of a single complete toe amputation (CTA) or single partial toe amputation (PTA) and a minimum of 12-month follow-up in the electronic medical record.
- Exclusion Criteria: Any elective foot or ankle procedure performed prior to or after the index amputation or who had a lower extremity amputation done at an outside medical facility.
- Independent variables: Patients identified using CPT codes
- OUTCOME MEASURES:
  - Number of Subsequent Procedures
  - Number of New Post-Operative Wounds
  - Location of New Post-Operative Wounds
  - Time Frame when a Patient was Released from Care and Voluntary Return to Care

STATISTICAL ANALYSIS

- Independent sample t-tests, Mann-Whitney U and Fisher’s Exact Tests were used to identify differences between CTA and PTA, and between a sub-cohort, with and without SN.

RESULTS

- Number of New Wounds
- NEW WOUND LOCATION

ANALYSIS & DISCUSSION

- Patients with SN had significantly more subsequent procedures and increased incidence of new wound development compared to those without SN.
- There were no differences among outcome measures in patients with CTA and PTA.
- 58% of patients required a subsequent procedure and 53% developed a new wound after the index procedure, similar to the incidences of new wound development following hallux amputation reported as 48%.2
- An average of 280 days passed between the index procedure and the first subsequent procedure.
- 65% of new wounds developed in the toes. As demonstrated after hallux amputation, any level of digital amputation likely alters biomechanics, causing abnormal pressure distribution and putting the most adjacent soft tissue structures at risk of breakdown and deformity.
- If one assumes preserving length is biomechanically advantageous, removing the least amount of affected toe may protect against the cascading events of wound development, infection, and amputation. Unfortunately, this protective effect was not seen in those with SN.
- While prior literature has shown promising results for conservative treatment of digital amputation, these have been limited by small sample size and short follow-up.
- Further investigation is needed to ascertain causes of complications following digital amputation.

REFERENCES

4. Jones IR, Mitchell RR. Does the priority of an amputation, length of time between front line development and amputation, or gynecologic control at the time of amputation affect the mortality rate of patients with diabetes and unilateral transverse foot amputation? J Wound Care.2005;14:151-152.