Clinical Outcome Differences Between Single and Multi-stage Transtibial Amputations

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Background

- Transtibial (below-the-knee) amputations are necessary in cases of irreversible lower extremity tissue damage.
- Indications for amputation include prolonged ischemia, septic gangrene, osteomyelitis, and malignancy.
- Current transtibial (below-the-knee) amputation methods:
  - Single guillotine amputation
  - Multi-staged with primary and formalization amputations
- Advantages of multi-staged amputations:
  - Decreased post-amputation muscle retraction
  - Reduced risk of spreading infection/necrosis
  - Decreased need for stump revision
- Disadvantages of multi-staged amputations:
  - Higher monetary costs
  - More time spent in the hospital
  - Increased utilization of clinical resources

Results

**Objective:**
- Assess if multi-staged amputations provide improved clinical outcomes over single stage amputations.
- Determine patient groups that possibly benefit from multi-staged amputations.

**Methods**
- Objective: Assess if multi-staged amputations provide improved clinical outcomes over single stage amputations.
- Determine patient groups that possibly benefit from multi-staged amputations.
- Retrospective study using records of patients who received single or multi-stage transtibial amputations from January 2015 through December 2020.
- 207 patient records were queried.
- 118 patient records were analyzed after accounting for exclusion criteria.
- Built database from patient records in REDCap.
- We performed a chart review while recording factors such as:
  - Demographic data
  - Comorbidities
  - Preoperative factors
  - Surgical factors
  - Complications
- Chi-squared or student’s t-tests were used to test for differences in demographics, comorbidities, preoperative factors, and some surgical factors.
- Regression analyses were used to relate clinical factors to the hazard of a complication and other functional outcomes between amputation groups.

**Data Analysis**
- Complications were evaluated using either single stage or multi-stage transtibial amputations.
- Univariate analyses were used to compare groups.
- Regression analyses were conducted to determine risk factors for complications.

**Discussion**
- Multi-stage transtibial amputations are associated with an increased risk of developing a complication compared to the single stage group.
- Patients requiring multi-stage amputations may have worse preoperative health compared to single-stage patients.
- Further analysis needed to examine and compare electively staged amputations to single-stage amputations, as disease severity is currently not controlled for.

**References**

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