Complications of major lower extremity amputation: How to avoid them.

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Nothing to disclose
Complications

Systemic
- Death 5-15%
  - BKA- 5%
  - AKA- 12%
  - Guillotene-14%

Local
- Wound infection
- Non-primary healing
Death\textsuperscript{1,2,3}

- Age
- ASA scale
- Dialysis dependence
- CHF/COPD
- Low albumin
- Emergent surgery
- Above knee amputation
- Need for revision
Potential Solutions

- General versus regional anesthesia
- Blood transfusion
- Factors that affect wound occurrence and reoperation
Anesthesia

- No randomized controlled trials

- Propensity matched retrospective data\textsuperscript{4}
  - Spinal anesthesia associated with decreased mortality
    * Most pronounced in highest risk patient groups

- Retrospective data\textsuperscript{5}
  - Spinal anesthesia associated with decreased pulmonary complications and cardiac arrhythmias
Transfusion

- No randomized trials

- Retrospective data:
  - May increase infectious complications and even mortality\textsuperscript{3,6}
  - May reduce MI\textsuperscript{6}
  - Not robust
Tourniquet

- Randomized data and non-randomized prospective\textsuperscript{7,8}
  - Decrease blood loss with tourniquet use (250ml vs 500ml)
  - Decrease need for transfusion
  - No effect on mortality
Immediate postoperative cast$^{9-14}$

- Case series and retrospective data
  - Improved healing
  - Decreased length of stay
  - Decreased pain
  - Decreased need for revision

- Controlled data
  - Decrease time to initial prosthetic training
  - Decreased edema
  - No difference in primary healing, pain, prosthetic use, LOS, or time to final rehabilitation
Wound Complications

- Large database studies\(^1\)
  - AKA vs BKA
  - INR
  - Closed suction drains
  - Skin staples
Wound occurrence

- Wound occurrence
  - Wound infection
  - Sterile dehiscence
  - Need for reoperation
    - Revision
    - Higher level amputation

Non-primary healing
Wound Occurrence

Non-primary Healing: 21%
Infected Wound: 17%
Return to OR: 20%
Risk factors for non-primary healing

• Diabetes
• Dialysis dependence
• HgA1c > 8%
• Albumin < 3
• Nasal MRSA colonization
### Non-primary healing

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<thead>
<tr>
<th>Factor</th>
<th>Univariate</th>
<th>Multivariate</th>
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<tbody>
<tr>
<td>Nasal MRSA</td>
<td>p&lt;0.05</td>
<td>NS</td>
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<tr>
<td>HgbA1c &gt; 8%</td>
<td>p&lt;0.05</td>
<td>P&lt;0.05</td>
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<tr>
<td>Dialysis dependence</td>
<td>p&lt;0.05</td>
<td>p&lt;0.05</td>
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<tr>
<td>Albumin &lt; 3</td>
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<td>NS</td>
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<tr>
<td>Diabetes</td>
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### Wound infection

<table>
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<th>Factor</th>
<th>%</th>
<th>univariate</th>
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<tbody>
<tr>
<td>MRSA colonization</td>
<td>45</td>
<td>p&lt;0.05</td>
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<td>No MRSA colonization</td>
<td>15</td>
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</table>
Percentage of MRSA colonization:
- 74% No MRSA colonization
- 26% MRSA colonization

Organisms in post-operative infections:
- 75% MRSA
- 17% Proteus
- 8% E. Faecalis
Wound Prevention Strategies

- Prolonged antibiotics$^{15}$
  - Some benefit
- Expanded antibiotic coverage$^{16-17}$
  - No benefit
- Local antibiotic delivery$^{18-20}$
  - Benefit in other specialties
  - Robust data
- Eradication of MRSA colonization$^{21-22}$
  - No randomized data
  - Prospective data from other specialties suggests benefit
Summary

- Patients undergoing MLEA have a high mortality
  - Mortality is mainly related to comorbidities
  - Regional anesthesia may benefit patients with worse comorbidities
- No good evidence for restricting blood transfusions
- Use of a tourniquet is beneficial
- Wound complications are common
  - Improved control of diabetes
  - Immediate post-operative casts have shown some benefit
  - Eradication of nasal MRSA warrants investigation
  - Local antibiotic delivery warrants investigation
References


20. Strom et al. Lumbar laminectomy and fusion with routine local application of vancomycin powder: decreased infection rate in instrumented and non-instrumented cases. Clinical neurology and Neurosurgery 2013, 115(90): 1766-69