THE TOOL BOX FOR LIMB SALVAGE IN 2013

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Fate of the Amputee

AKA: 40-60% increase in effort
BKA: 20-40%
- Rate of independent ambulation:
  BKA: 33-65%
  AKA: 19-33%

Fate of the Amputee: VAMC

↓ Mobility: 28% ambulating independently with BKA
↑ Institutionalization: 56% rehab or nursing home
↑ Health care costs: Amp 2x > Limb salvage

$113,000
Below Knee Amputations

Strategy
1. Improve perfusion in the ischemic limb.
2. Promote wound healing
   Practical
   Cost Effective
3. Minimize Surgical Site Infections

Surgical Bypass
- Estimated 30 day mortality < 5%
- Life expectancy ≥ 2 years
- Single segment vein ≥ 3mm diameter
- TASC C and D lesions
- Major tissue loss

PREVENT III- single segment GSV
91% limb salvage rate at 1 year

Do not use prosthetic for tibial or peroneal bypass
*Infection rate > 23% …..burn the bridge for BKA*

Endovascular Reperfusion in CLI

Endovascular Procedures:
- ↓ Mortality
- ↓ Morbidity
- High technical success
- Equivalent limb salvage at 1 year

"Endo First"
- Inadequate vein conduit
- Renal failure
- Poorly controlled diabetes
- > 80 yo
- High risk surgical patient: COPD, CHF, CAD

Surgical Bypass
Endovascular procedures 2008-2012 ↑ 63%
Long-term outcomes following infrapopliteal angioplasty for critical limb ischemia

- Retrospective analysis of infra-pop PTA
- Treated 459 limbs in 413 patients 2004-2012
- TASC class:
  - A: 16%  B: 22%  C: 27%  D: 34%
- Technical success 93%
  all failures occurred in TASC D lesions
- High risk: Dialysis: 71 (15%)  DM: 342 (75%)  
- In hospital mortality: 2%


Hybrid PTA and Bypass
29 Procedures – inadequate length of GSV

Tandem infra pr ante

47 yo Diabetic, previous bypass

Composite Primary Patency: 74% 1 year
Secondary Patency of 80%
CTO: Retrograde Access

Negative Pressure Wound Therapy (NPWT)

NPWT vs. Advanced Moist Wound Therapy
- 342 patients with diabetic ulcers
- Complete ulcer closure
  - NPWT: 73/169; 43.2%
  - AMWT: 48/166; 28.9%

Partial foot amputation: NPWT vs. SOC
- ↓ surgical procedures: 43 vs 120; P < .001
- ↓ dressing changes and outpatient visits
- $12,800 saved

Current Practice: wound vac on all toe and partial foot amputations

Hyperbaric Oxygen Therapy
- HBO ↑ Transcutaneous pO2 in ischemic ulcers
  - Stimulates angiogenesis, fibroblast and leukocyte function, improves microvascular function
- Kalani, et al:
  - 38 patients with ulcer and TcPO2 < 40 mmHg
    - 17 HBO, 21 Standard of Care (SOC)
    - 3 years: HBO: 76% healed ulcer 12% amputation
      - SOC: 48% healed ulcer 33% amputation
  - HBO expensive: $15-40,000
    - Requires travel
Stem Cell Therapy for Ulcers

Conclusions

1. Adequate single segment vein in good risk surgical patient: Bypass
2. Inadequate vein: Endovascular or hybrid procedure
3. High Risk Patient, Life Expectancy < 2 years: Endovascular
4. Retrograde access expands options for patients with CTO and not candidates for bypass
5. Advocate NPWT for diabetic foot wounds
6. HBO is limited by access and cost
7. Cell therapy will have a role in limb salvage