

A Life in the Practice of Limb Preservation: Key Essentials to Success

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DISCLOSURE

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- No relevant financial relationship reported

Bias and Disclosures



- Vascular Surgeon with a strong interest in Limb Preservation (23 years of experience)
- The views expressed in this presentation are my views and do not reflect the official policy of the Department of the Army, the Department of Defense or the U.S. Government

Key Essentials to Success

Objectives

- Define Goals - Redefinition of Limb Preservation
 - Tissue Preservation vs Functional Restoration
- Team Approach
 - Vascular
 - Podiatric
 - Wound care
 - Function of team
- Results of a Limb Preservation Initiative

Redefinition of a Limb Preservation Initiative

Limb Salvage is not just about revascularization of CLI, or Tissue Preservation but a pathway involving a Passionate Team that treats all factors contributing to a Major Amputation and focuses on rapid restoration of function at the highest level possible

Significant Difference between Limb Preservation
and Functional Restoration

Limb Preservation Redefined (Functional Restoration)

- Limb Preservation - salvage of a limb that would have otherwise been amputated
- Change in philosophy - Transition from tissue preservation to functional restoration
- In addition to avoiding primary major amputation, the goal of a limb preservation initiative is to achieve a plantigrade foot that provides the highest level of function with the shortest recovery period, even if that means a minor amputation and/or reconstructive foot surgery.
- Promoting the highest level of function for the longest period of time

Limb Preservation – Supplement to WOUNDS Sept 2009

Ponticello M, Andersen CA, Marmolejo (Schade) VL. Limb Salvage Versus Amputation: A Closer Look at the Evidence, Costs and Long-Term Outcomes. Podiatry Today. March 2016; 29(3).

Tissue Preservation vs Functional Restoration

- Tissue preservation is not the same as Functional Restoration
 - Managing a diabetic foot ulcer in the wound care clinic for weekly dressing changes for a year is not functional restoration.
 - Sequential removal of 4 toes over a year with episodes of recurrent ulceration is not good functional restoration

Limb Preservation – MAMC Experience Evolution over 23 years

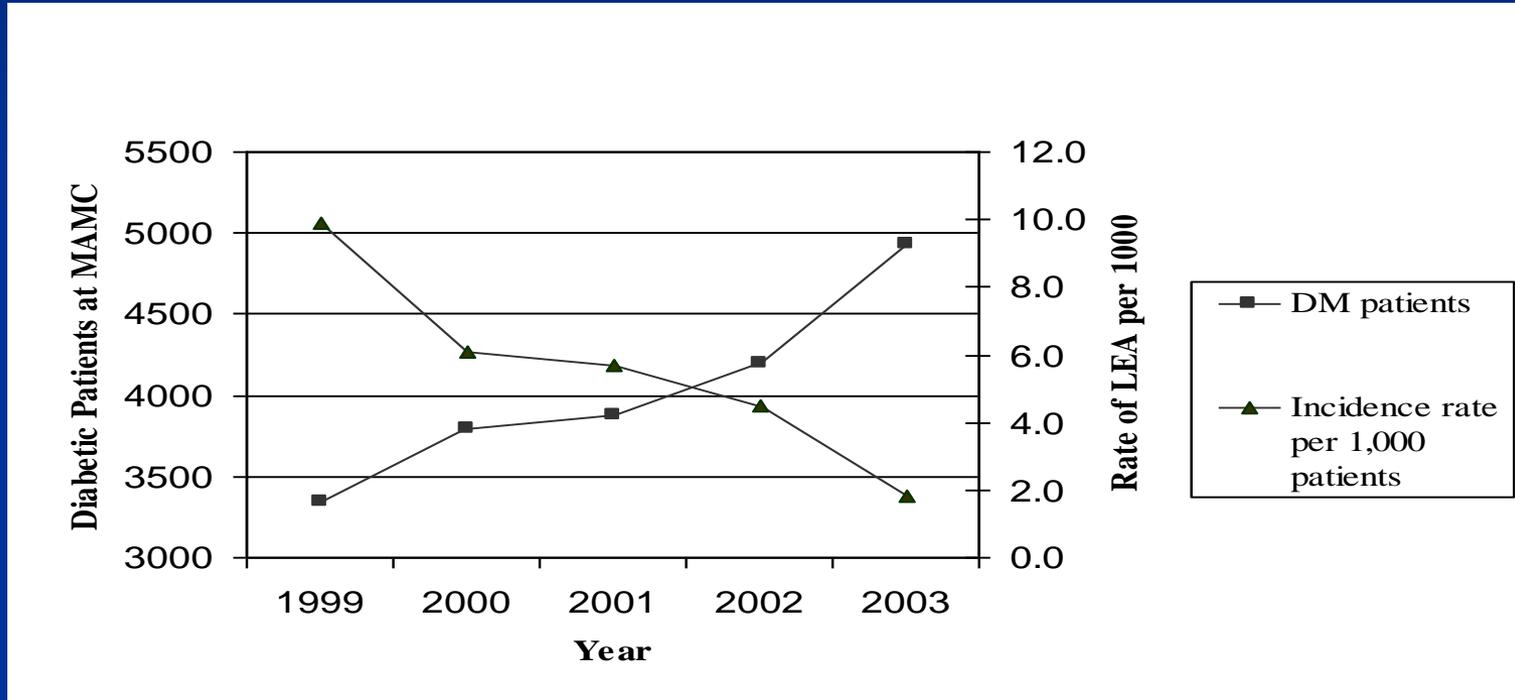


Background

Observations lead to Initiatives

- Diabetic patients referred to Vascular Surgery had advanced disease with ulcerations and/or foot infections. (*Delayed Recognition*)
- (*High amputation rate*) in diabetics with poorly treated wounds admitted with foot infections
- As a result of these observations we developed a multidisciplinary team – Vascular Surgery, Advanced Podiatric Care and Wound Care

Success of the Team Approach Major Amputations (1999-2003) Reported in 2005



Incidence rate was decreased 82%.

Driver VR, Madsen J, Goodman RA. Reducing amputation rates in patients with diabetes at a military medical center: the limb preservation service model. Diabetes Care 2005 February 1;28(2):248-53.

Success of the Team Approach

Major Amputations - 10/2015-10/2016

- With a successful Limb preservation program the number minor amputations will increase but the number of major amputations will decrease
- Five major amputations since October 2015 making the limb salvage rate 99.2% (5 major amputations in the 600 patient at risk population).

Preventing Amputations (Team Approach)

- A retrospective review of a limb salvage program in Sweden reported a 78 percent reduction in major amputation rates.
- Prospective studies in the United States (over five years) and United Kingdom (over 11 years) have shown an 83 percent reduction and 62 percent reduction respectively when utilizing a team approach to limb salvage.

Diabet Med. 1995; 12(9):770-6.

J Vasc Surg. 2010; 52(3 Suppl):23S-27S.

Team Approach

- Studies have demonstrated that a team approach works
- What are the components of a team approach?
- How does the team function?

Successful Limb Preservation TEAM

- Similar to NFL Team – not weekend touch football
- Select players with correct skills
 - Vascular is critical but can not work alone
- Passionate coach
- Playbook - protocols
- Practice – on same field
- Huddle, Huddle, Huddle (Constant Communication)
- Celebrate success – use the 12th man

Andersen C, Diabetic Limb Preservation: Defining Terms and Goals .Journal of Foot and Ankle Surgery 49 (1) 106-107, Jan/Feb 2010

Vascular Component



Vascular Component

Lessons Learned

- High Index of suspicion
 - The eye doesn't see what the mind doesn't know
 - Limitations of Vascular Lab
 - Regional malperfusion of the foot
 - Orphan Heel Syndrome
- Early identification and timely and aggressive treatment
 - Treat critical limb ischemia before a wound develops or when the wound is small

Identification of PAD

- Diagnosis may be obvious with a good history and physical
- At times the diagnosis is very subtle and requires a high index of suspicion
- **Silent PAD** is common especially in patients with diabetes or patient that have neuropathy or limited ambulation

Avoid Wounds

- Avoiding foot ulcers is a critical component of Limb Preservation
- A callus is like a TIA, A foot ulcer is like a Stroke
- A callus deserves a full workup and treatment of the cause
- Vascular assessment prior to even a minor foot procedure – removing a toe nail can result in a major amputation

Ischemia/ Diabetic foot ulcers

- An ulcer is often the precursor for an amputation
- PAD is usually not the cause of diabetic foot ulcers; however, is a major factor leading to amputation
- An ulcer with ischemia should be treated early before additional tissue loss or infection

Avoiding Operative Complications

■ Quote: Mario Ponticello DPM

“At a regional M&M conference the most common cause of post op complications was failure to identify coexisting vascular disease prior to performing a podiatric procedure.”

An elective foot operation – leading to a wound –
Ischemia not identified – wound gets bigger –
Amputation results

Treatment of Vascular Disease

- Requires a vascular team with dedication and passion for preventing amputation
- It is time consuming and not easy
- Timely Diagnosis
- Aggressive Treatment
 - Advanced endovascular techniques
 - Open surgical expertise

Advanced Podiatric Care

- Understanding of biomechanics
- Preventing and treating ulceration
- Minor amputations
- Expert on external and internal off loading and rebalancing of foot
- True gatekeeper with rapid access to treatment

Wound Care

- Passion and dedication
- Advanced wound care techniques
- Knowledge of not only treating the wound but also treating the disease

It is more important what you take off from a diabetic foot ulcer than what you put on – All wound care must be combined with off loading

Infection

- A diabetic foot infection is like a myocardial infarction
- Time is tissue
- Source control prior to revascularization
- With source control save viable tissue

Conclusions

Key Essentials to Success

- Passionate team working as a unit
- **Timely** diagnosis and treatment of factors contributing to amputation (Time is Tissue)
- Prevention of primary and recurrent ulceration is critical
- Focus on functional restoration as well as tissue preservation
- Limb Preservation is a specialty and is a way of life