Role of Plastic Surgeons in Diabetic Foot Management

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• Up to 6 percent of patients with diabetes may develop a diabetic foot ulcer (DFU) with over 15 percent requiring an amputation

• Foot problems remain the commonest reason for hospitalization in DM
Aetiology is multifactorial which poses great challenges in management

- Neuropathy
- Infection
- Ischemia
- Altered foot structure and biomechanics
  *(Intrinsic Minus Foot)*
Intrinsic Minus Foot

• Hammer toes
• Prominent plantar metatarsal heads
• Wasting of lumbricals
• Upward rotation of the forefoot
• Distal migration of the plantar metatarsal fat pads
• Weak extension of the hallux longus
• Cock-up deformity of the hallux longus with prominent extensor tendon
• High arch
• Xerotic skin (*Sympathetic neuropathy*)
Management is multidisciplinary

- Adequate **offloading**
  - Correction of *Equinus deformity*
- Frequent **debridement**
- **Moist** wound care & **NPWT**
- Control of **infection**
- Revascularization of an ischemic limb
- **Coverage** of resistant ulcers and raw areas
Fundamental goals of reconstructive surgeons have not changed since ancient times

Preservation of *Form & Function*
Promotion of Healing (ADSCs & Fat Transfer)

Reconstruction and Coverage

Prevention of Recurrence (TAL)
Adipose Derived Stems Cells (ADSCs) & Stromal Vascular Fraction (SVF)
Vacuum Therapy

Negative pressure wound therapy (NPWT) involves the creation of subatmospheric pressure in the local wound environment to promote tissue granulation & decreases tissue oedema.
Temporary Skin Substitutes

Accelerates wound healing
prevents infection from outside
keeps moist environment
Reconstructive Ladder in DFU

- Negative Pressure Wound Therapy
- Temporary Skin Substitutes
- Regenerative therapy
- Correction of Equinus Deformity
- Delayed 1ry Closure / Healing by 2ry Intention
- Split Thickness Grafts
- Local Random Flaps
- Axial Pattern Fasciocutaneous Flaps
- Intrinsic Muscle Flaps
- Free Flaps
Reconstruction in Diabetic foot ulcers

**Weight bearing areas**
- Metatarsal heads / Heel

**Non-weight bearing areas**
- Forefoot / Instep / achilles region / dorsum
Local Random Flaps

Length / Width Ratio Should be less than 2 to 1
Should be designed in a mobile pliable area

- Transposition flaps
- Advancement flaps & VY flaps
- Rotational flaps
- Interpolation flaps
Axial flaps

- Medial Plantar Artery Flap
- Reverse Sural Artery flap
- Great toe fibular flap
- Dorsalis Pedis Dorsal Island Flap
Medial Plantar Artery flap
Medial Plantar Artery flap
Muscle flaps

The most widely used intrinsic muscle flaps for soft tissue reconstruction

- **Abductor hallucis flap** for plantar and medial wounds,
- **Extensor digitorum brevis flap** for small ankle defects, the lateral calcaneus and lower tibial wounds,
- **Flexor digitorum brevis flap** for plantar central wounds,
- **Abductor digiti minimi flap** for tissue loss about the lateral aspect of the mid- and rearfoot. Surgeons often use this flap to close plantar lateral ulcerations.
Free Tissue Transfer

- Radial forearm flap
- Rectus abdominis muscle flap
- Latissimus dorsi muscle flap
Tendo Achilles Lengthening

Primary or Adjunct treatment

Achilles tendon gradually loses its flexibility in diabetic patients and the foot fails to dorsiflex during gait placing abnormal forces on the midfoot and these pressures in the neuropathic patient can lead to forefoot ulceration

Percutaneous TAL

Gastrocnemius Recession