Role of Plastic Surgeons in Diabetic Foot Management

By

Dr. Tarek Ahmed Said

Professor of Plastic Surgery

Cairo University

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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*

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Promotion of Healing (ADSCs & Fat Transfer)

Reconstruction and Coverage

Prevention of Recurrence *(TAL)*

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Adipose Derived Stems Cells (ADSCs) & Stromal Vascular Fraction (SVF)

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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

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Temporary Skin Substitutes

Accelerates wound healing

prevents infection from outside

keeps moist environment

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Kasr El-Aini Faculty of Medicine, Cairo University
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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**

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Reconstruction in Diabetic foot ulcers

Weight bearing areas

Metatarsal heads / Heel

Non-weight bearing areas

Forefoot / Instep / achilles region / dorsum

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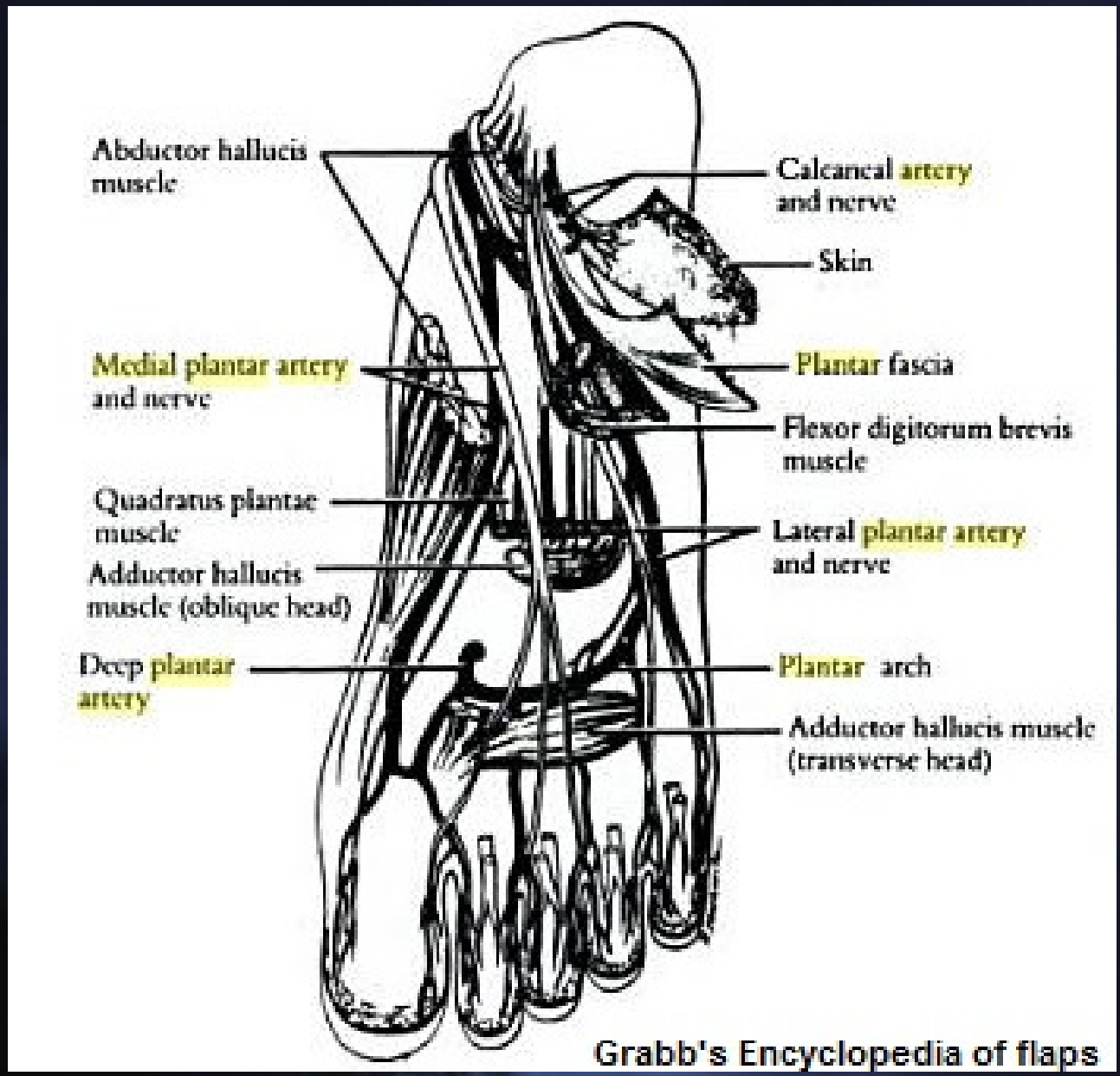
Local Random Flaps

Length / Width Ratio Should be less than 2 to1
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


Abductor hallucis muscle
Calcaneal artery and nerve
Skin
Medial plantar artery and nerve
Plantar fascia
Flexor digitorum brevis muscle
Quadratus plantae muscle
Lateral plantar artery and nerve
Adductor hallucis muscle (oblique head)
Deep plantar artery
Plantar arch
Adductor hallucis muscle (transverse head)
Grabb's Encyclopedia of flaps

Medial Plantar Artery flap

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Medial Plantar Artery flap

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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

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THANK YOU

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