Case Report Diabetic Foot

Erik Manning

Woundconsultant
Casting technician
Twenteborg Hospital
Netherlands
The Pathogenic Triad

neuropathy

ischaemia

trauma

Falanga V. Lancet 2005; 366:1736-43
Mr. S., first plantar ulcer in 1997. Preventive orthopedic shoes. No re-ulceration. Just back from vacation in Greece. Cold and shivering. His wife called the outpatient clinic.
Plantar Ulcer in 1997
PREVENTIVE ORTHOPEDIC SHOES
Case Report 24-08-2006

- Gender: Male
- Date of birth: 25-04-1941
- Length: 1.76
- Weight: 100 kg
- Smoking: ex-smoker for 9 years
- Footcare: every 4 weeks
- Medication: insuline mixtard 30/70
Case Report 24-08-2006

Cause?
High Pressure MTP 1 Joint

TRAUMA
Assessment

- Edema +
- Pulsation -, doppler, TP +, DP -
- Neuropathy ++
- Foot deformity (Cavus foot, klawtoes)
- Tension 150/80
- Diabetes control; HbA1c 7,5
Further Assessment

- Etiology (insufficiënt shoes)
- TcPO2 measurement 43 mm/Hg
- X-Ray: (osteomyelitis / gas)
- Woundculture
Neuropathic or Neuroischemic? 
Infection?
Wound infection

- In diabetic foot infections, the classical signs of local and systemic infection may be weak or absent.
Local Signs may be absent or weak

- Erythema and pain maybe absent
- Neuropathie leads to diminished neuro-feetback and failure of vasodilatation
Micro-angiopatohy and Infection

- Mediascleroses leads to decreased microcirculation
- Leukocytes can’t go out (thick wall)
- Ischemia leads to absence of erythema (no autolytic response)
- Hypoxia in the woundbed leads to decreased numbers of macrophages and neutrophils
Mönkeberg-, Mediasclerose
Predictive Indicators of Wound Infection

- Spreading erythema (mark inflammation, change in condition)
- Change in nature of pain (increasing)
- Wound stops healing (enlarges)
- Foul odour (malodour not ranked highly)
- Absorbing percentage in dressing
- Friable granulation/sloughy tissue
Diagnose wound infections clinically by the presence of purulent secretions or local evidence of at least **two** signs of inflammation: redness, pain, induration, increasing skin temperature, lymphangitis, foul smell.

Or occasionally systemic toxicity.
Debridement Evidence Based!!!

- Debridement; removal of unwanted tissue
- Necrose → barrier → Bacterial burden
- Debridement asselerates endogenous woundhealing

What if we omit Debridement?

- Bacterial burden increases $\rightarrow$ infection
- Classification impossible
- Foul smell
- Barrier to antibiotics / dressing
- Cell migration disordered (Delayed healing)
Removal of Callus and Necrosis

Localized tissue death
Wound assessment after Debridement

Probing, contact not in joint MTP1 or bone

24-08-2006
Woundculture after Debridement
Wound classification after Debridement

- Infection; redness -, induration +, pain -, foul smell +, feeling cold and shivering
- Necroses +, callus +, maceration +
- No bone contact
- Location; MTP1 Left plantar
- Size; 2.0cm-1.2cm-1.5cm depth
- Classification
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<tbody>
<tr>
<td>A</td>
<td>Healed ulcer, or Foot at risk</td>
<td>Superficial wound, no bone or tendon contact</td>
<td>Deep wound, no bone or joint contact</td>
<td>Wound penetrating to bone, or joint</td>
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<tr>
<td>B</td>
<td>Infection</td>
<td>Infection</td>
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<td>Infection</td>
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<tr>
<td>C</td>
<td>Ischemia</td>
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<td>Infection and ischemia</td>
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*University of Texas classification voetulcus, Armstrong et al. 1998*
Wound diagnoses

- Infected neuropathic plantar ulcer, caused by insufficient shoes
- Wound classification of UT: 2B (wound not involving joint or bone/infected/no ischemia)
Wound management

- Infection control (Hospitalization; AB I.V.)
- Sharp debridement, drainage
- Consultation internist (metabolic control)
- Off-loading; first bed rest
- Moist wound care
04-09-2006, Discharge

Off-loading ESSENTIAL!!!!!!!
Offloading: redistribution of load in the foot from the ulcer region to regions less susceptible to ulceration
TCC; somewhat pes equines and edema
Moulding

Weight-bearing area is smaller than the total plantar surface
Pressure Relief
Standard Woundcare

- Wound assessment incl. probing
- Debridement of callus and wound bed
- Moist environment en felt padding

**No** Foot bath
Woundcare every week

Pre Debridement

Post Debridement
8 Weeks Follow-up

24-08-2006

04-09-2006

11-10-2006

25-10-2006
21-11-2006, out of Cast, start with OS
ORTHOPEDIC SHOE WITH STIFF SOLE AND ROLLER / WALKOVER
15-01-2008

Debridement of Callus
Don’t get lost
Thank you
Osteomyelitis not always be treated with surgery
Management of osteomyelitis

- Scharp debridement → culture
- Oral antibiotics for 6-8 weeks
- Moist wound healing (topical antimicrobial agent)
- Offloading
- Outpatient clinic
Wounds with necrotic or poor blood supply

- Systemic antibiotics may not penetrate infected ischaemic tissue at therapeutic doses; local agents may be more successful
26-09-2005 debridement weekly

Pre debridement

Post debridement
Currently Used Antimicrobials

- Kortwerkend (Chlorhexidine, cocktails)
- Products containing iodine (cadexomer iodine and povidone iodine)
- Products containing silver (silver-impregnated dressings)
- Maggots
- Honey
Maggots and Honey

- Removal of Gram-positive bacteria more effective than removal of Gram-negative
- They provide also debridement
- Honey is antimicrobial and act as a debriding agent
- It helps with odour control
Evidence of Topical Antimicrobial Agents

- Limited evidence because of wide range of different wound types
- Diversity of products
- Costs of clinical studies
- Meta-analysis demonstrated the inadequacy of evidence of topical agents other than silver sulfadiazine
Geen of weinig evidence bij DFU behandeling wil niet zeggen dat een specifieke therapie of middel niet effectief is
Certain types of dressings (Hydrofiber AG, Actisorb AG) might enhance removal and inactivation of micro-organisms by retention within the dressing matrix.
Availability of Silver

- Body fluids or soiling with pus could affect the efficacy of silver
- Efficacy depends on the bioavailability of silver ions (slow sustained release)
- Impregnation and polymer technology have a controlled silver release through hydration
(Silver) dressings act as a barrier to wound contamination, but they cannot eliminate microorganisms already colonising a wound.
Optimising contact of the dressing with the wound will ensure a potential better antimicrobial efficacy.
Ernstige infectie