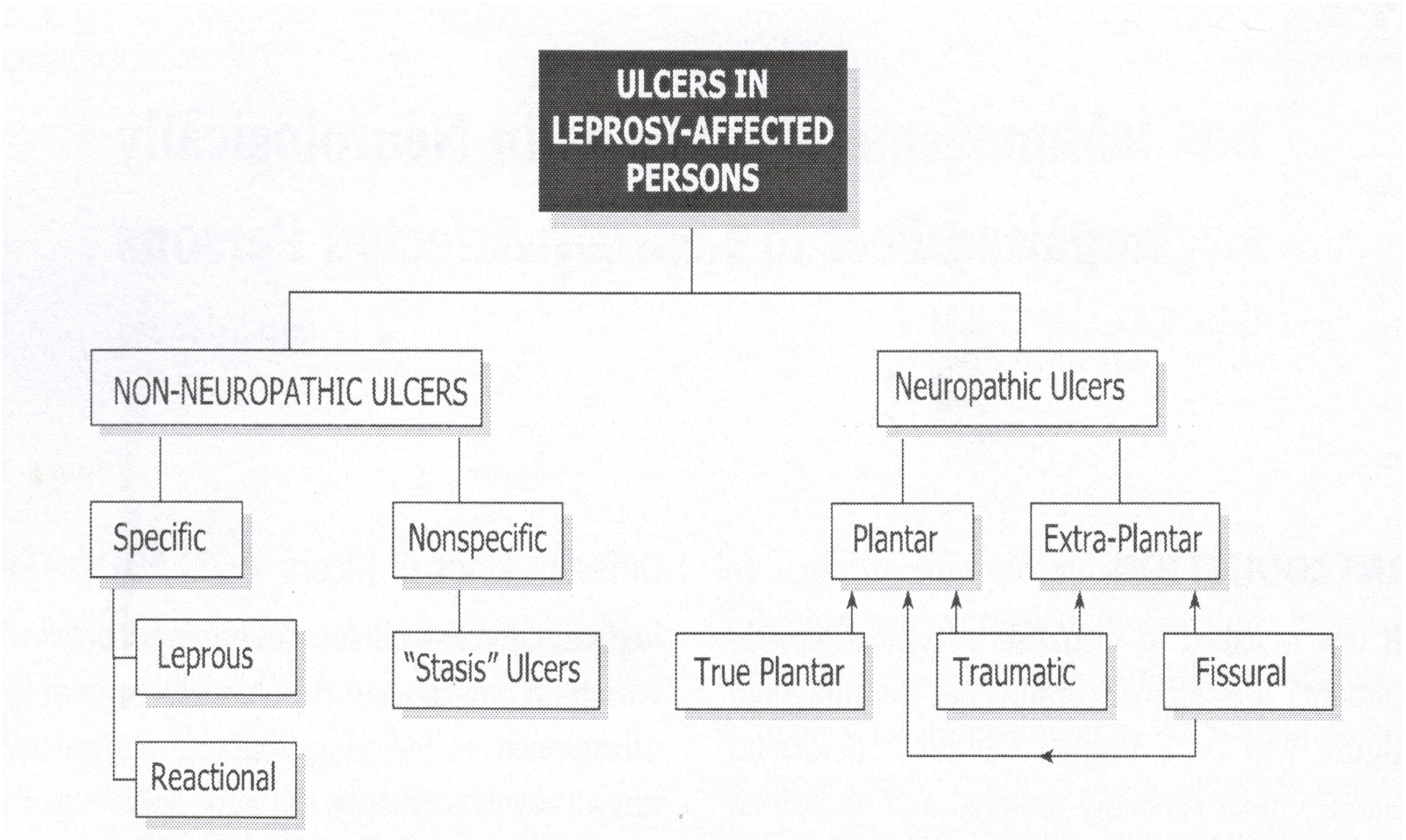
NEUROPATHIC ULCER IN LEPROSY

Dr. Durai M.S.(Gen.Surg.)
Senior Regional Director (Retd.)


ULCERS IN LEPROSY-AFFECTED PERSONS
NON-NEUROPATHIC ULCERS
Neuropathic Ulcers
Specific
Nonspecific
Plantar
Extra-Plantar
Leprous
Reactional
"Stasis" Ulcers
True Plantar
Traumatic
Fissural

LEPROUS ULCER

- **Nodule gives way – leprous granuloma exposed**

Site

Face, elbows, dorsum of hand, inside of nose,

Heals with MB-MDT

Reaction ulcers

REACTIONAL ULCER

- **Part of severe lepra reaction usually ENL at times reversal reaction**
- **Large blisters break open may have arteritis – tissue necrosis and break down**
- **Sites – extensor aspect of limbs and trunk**
- **Treatment high dose of steroids and supportive therapy**

NON SPECIFIC ULCER

- **Stasis ulcer / venous ulcer**
- **Large ulcer in front of ankle**
- **Background of pachydermatous skin with varicose changes**
- **Skin atrophic thin and shiny**
- **Site- medial or lateral malleolus**
- **Floor of ulcer sclerotic with thin pale granulation. Bed densely scarred and hard**
- **Serous or serosanguinous discharge -ve for AFB**
- **Usually vitiliginous area surrounding ulceration**

NEUROPATHIC ULCER

- **Plantar ulcer& extra plantar ulcer-**

(Syn-trophic ulcer-perforating ulcer-penetrating ulcer or mal perforans)

- **Historical concepts for cause of ulcer**
  - **Leprosy**
  - **Neuropathy**
  - **Trauma**
  - **Ischemia**
  - **Walking**

NEUROPATHIC EXTRA PLANTAR ULCERS

- **Over lateral malleolus**
- **Dorsum of toes**
- **Extra plantar hand ulcers**

AVERAGE DISTRIBUTION OF ULCER

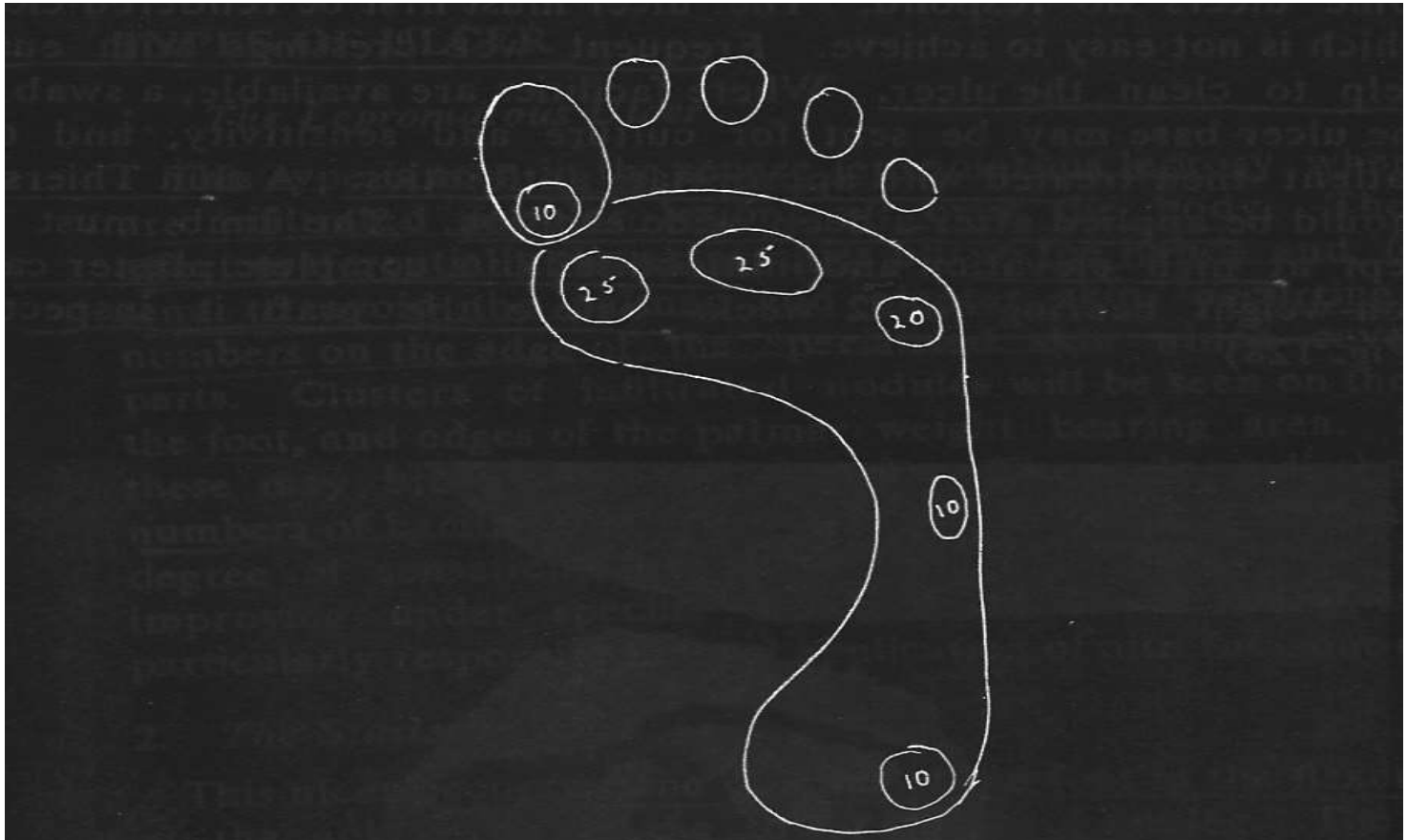
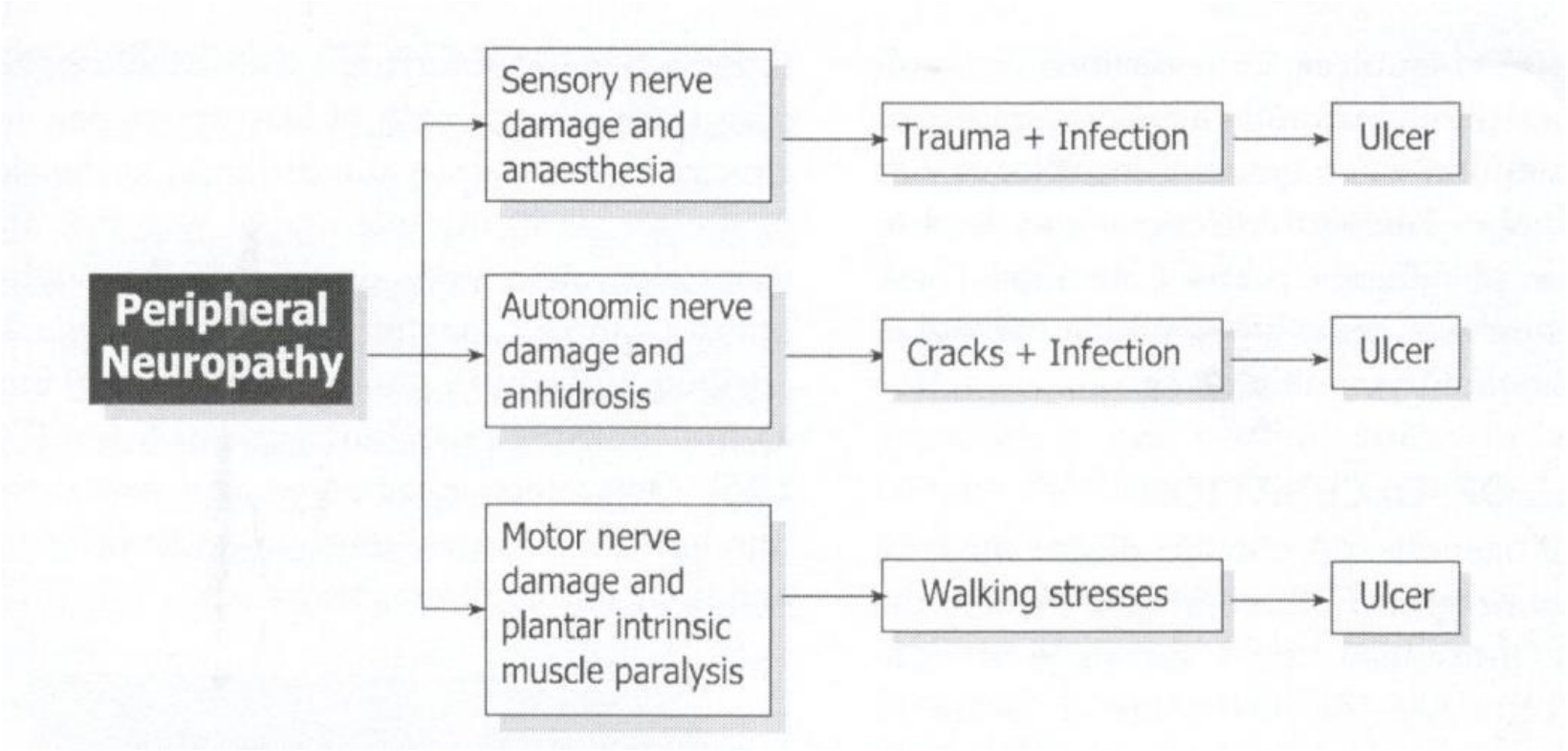


Fig. 129—Weight bearing area of foot showing average distribution of ulcers.

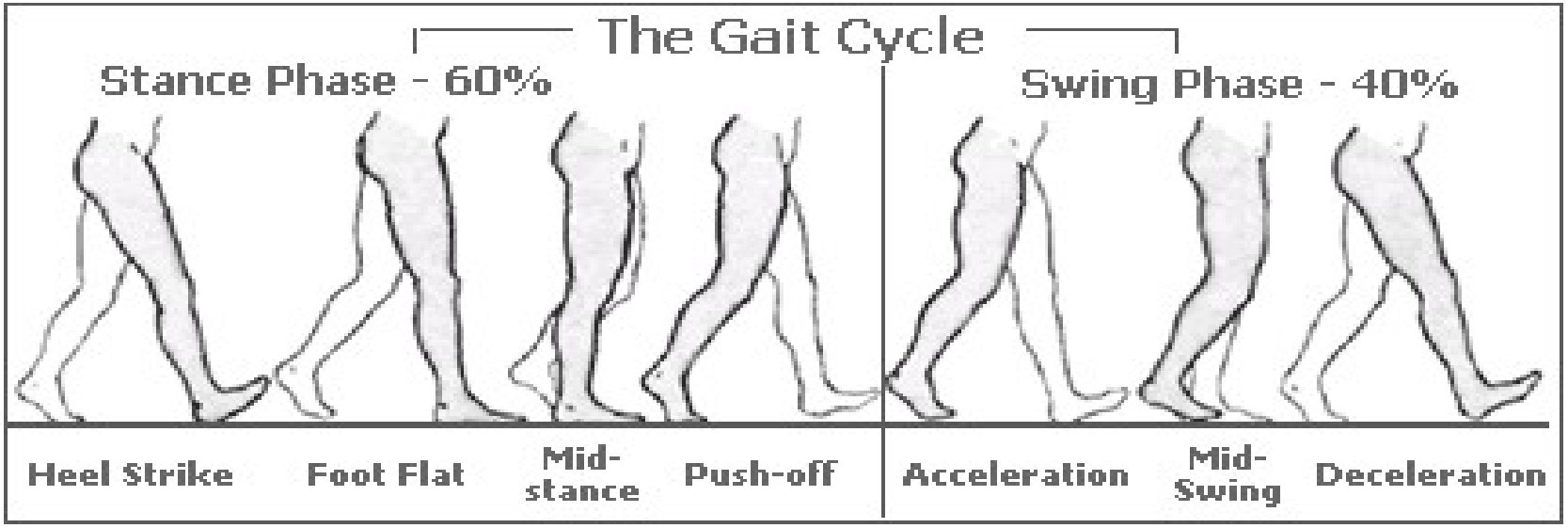
CURRENT CONCEPTS – MULTI FACTORIAL



MAIN CAUSES OF PLANTAR ULCER

- **Loss of sensation**
- **Paralysis of limbs**
- **Involvement of autonomic nervous system**
- **Recurrent lepra reactions**
- **Occupation of the individual**
- **Ill fitting foot wear**
- **Not following self care activities**
- **Misuse of hands and feet**
- **Negligence – not seeking treatment on time**
- **Causes for recurrent ulcer**
- **Neuropathic joints**

PHASES OF WALKING CYCLE

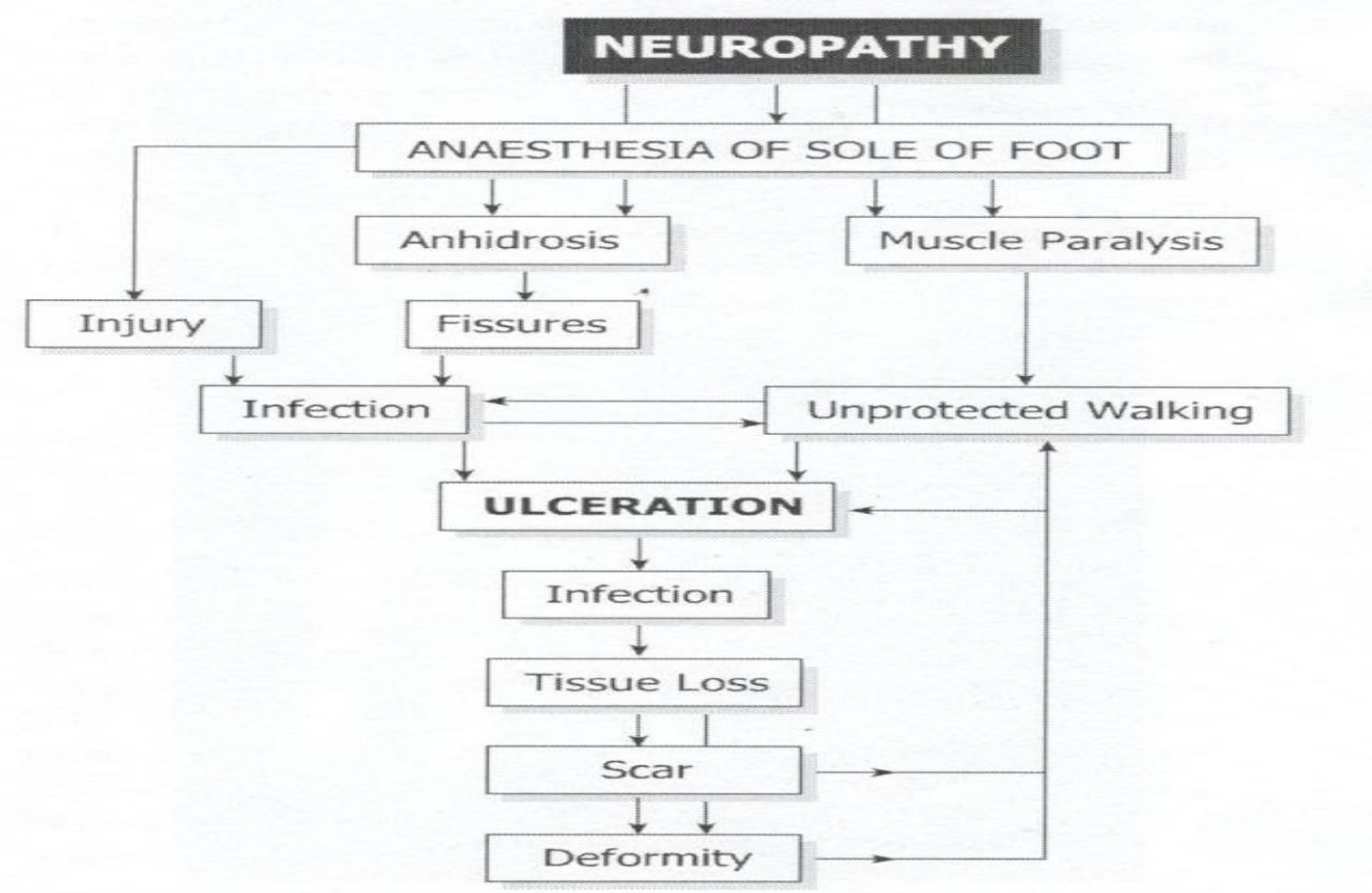


- **STANCE PHASE**
  1. **HEEL STRIKE**
  2. **FOOT FLAT**
  3. **MID STANCE**
  4. **HEEL OFF**
  5. **TOE OFF**

FOREFOOT PHASE OR METATARSAL PHASE OR PUSH OFF PHASE

- **SWING PHASE**
  1. **ACCELARATION**
  2. **MID SWING**
  3. **DECELERATION**

NATURAL HISTORY OF PLANTAR ULCER



AGES OF ULCER FORMATION

1. **Stage of threatened ulceration**
2. **Concealed ulceration**
3. **Stage of overt ulcer**
   - **-Simple ulcer**
   - **-Complicated ulcer**

MANAGEMENT OF ACUTE ULCER

- **Elevation**
- **Drainage**
- **Cleaning ulcer – EUSOL**
- **Moist dressing of plantar ulcer mgso4, glycerin mag.sulph, acriflavine**
- **Antibiotics-Do not use antibiotic as a routine**

  -Do not fail to use appr antibiotic when needed

MANAGEMENT OF CHRONIC SIMPLE ULCERS

- **BK plaster of paris cast after cleaning ulcer for physiological rest of foot**
- **Avoid repeated dressing to allow process of epithelisation**
- **SSG**

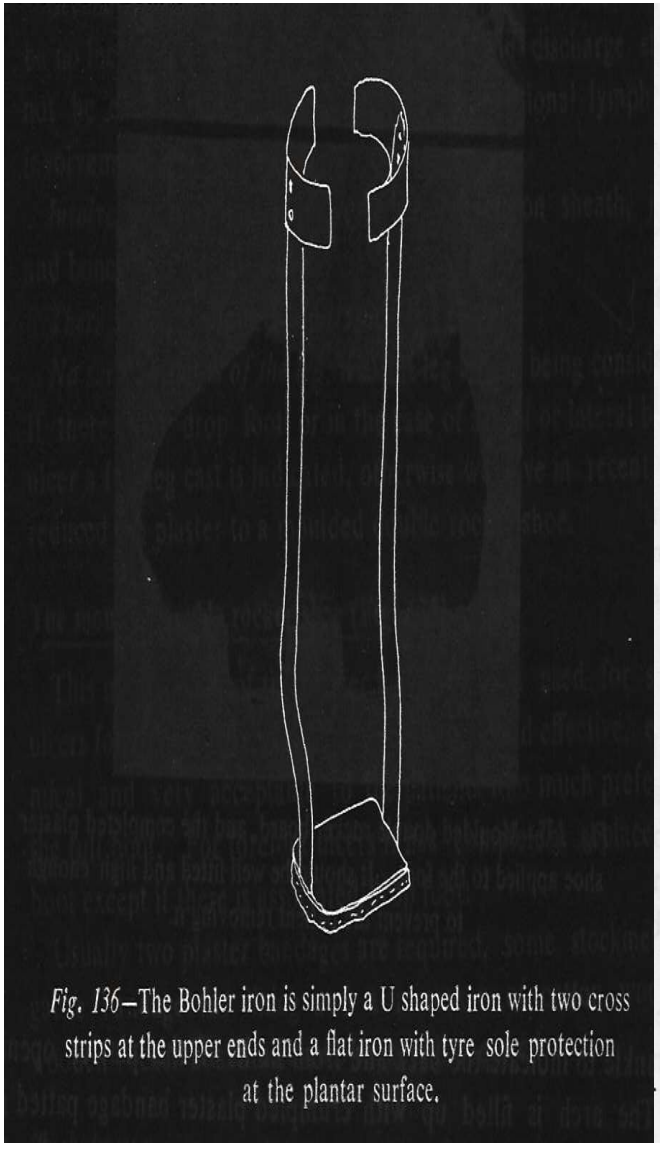


Fig. 136—The Bohler iron is simply a U shaped iron with two cross strips at the upper ends and a flat iron with tyre sole protection at the plantar surface.

138—The full below-knee plaster of Paris incorporated Bohler iron.

CHRONIC COMPLICATED ULCER

- COMPLICATING FACTORS
  - **Infection**
  - **Neoplastic degeneration**
  - **Septicemia**
  - **Deep fungal infection**
  - **Clostridial infection**
- **Surgical debridement**

ruthless excision of all dead and devitalized tissue, but careful conservation of all healthy tissue

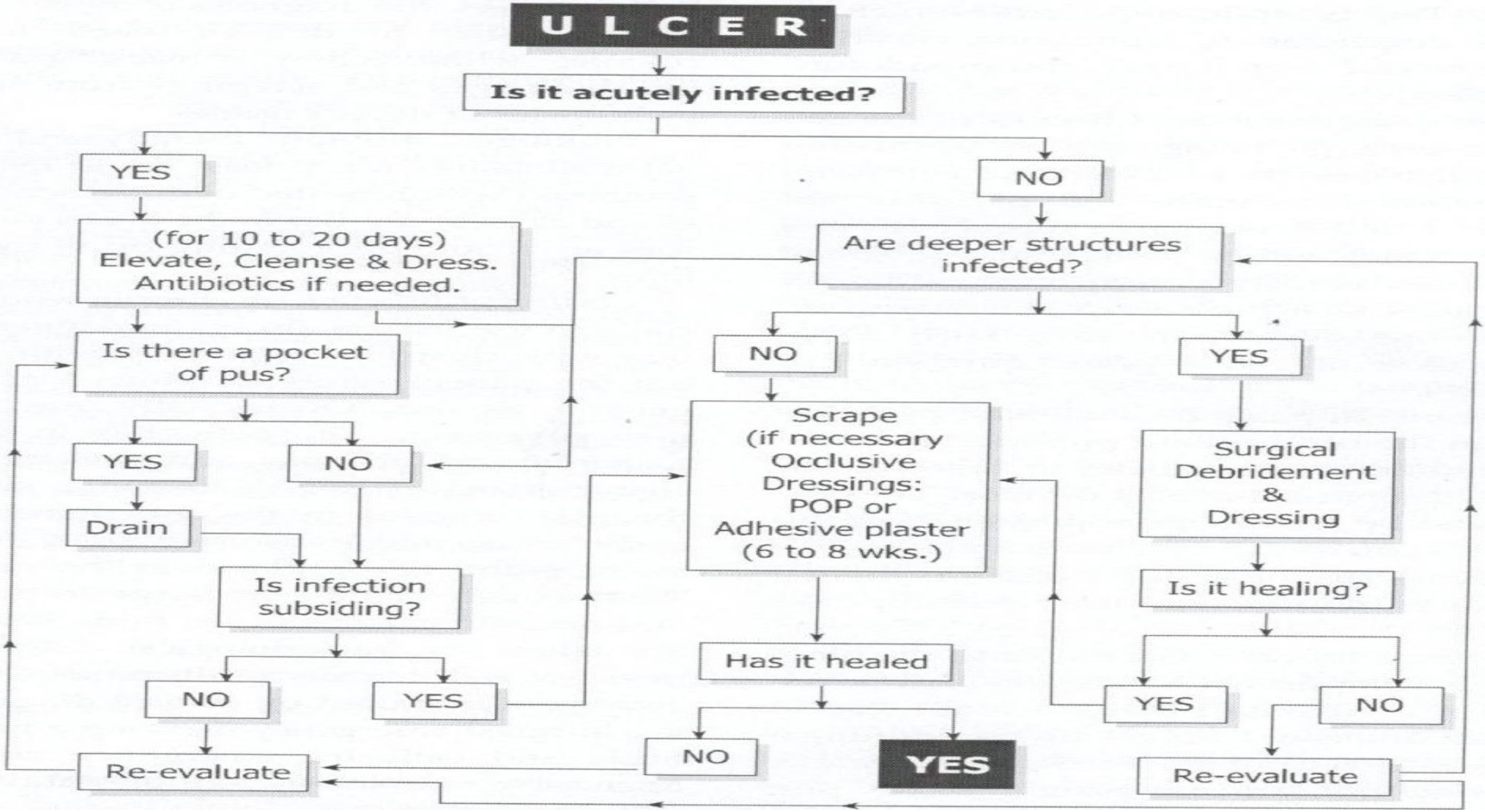
RECURRENT ULCERATION

- **The original cause continue to operate**
- **The scar tissue of poor quality**
- **The scar is loaded excessively**
- **Periodic flare up of infection**

  Skin care practices

  Reduction of walking strains

  Improving quality of scared site


ULCER
Is it acutely infected?
YES
NO
(for 10 to 20 days)
Elevate, Cleanse & Dress.
Antibiotics if needed.
Are deeper structures infected?
Is there a pocket of pus?
NO
YES
YES
NO
Drain
Scrape
(if necessary
Occlusive
Dressings:
POP or
Adhesive plaster
(6 to 8 wks.)
Surgical
Debridement
&
Dressing
Is infection subsiding?
Is it healing?
Has it healed
NO
YES
YES
NO
NO
YES
Re-evaluate
Re-evaluate

Muscle Group Paralysed	Site Made Vulnerable
antar intrinsics	Ball of the foot
Abd. hallucis group	I Metatarsal head region
Interossei-lumbricals	II, III, & IV Metatarsal head reg
Abd. dig. minimi group	V Metatarsal head region
Fl. dig.brevis / interossei & lumbricals	Tips of toes
oot dorsiflexors	Heel (Tip of Toes
eronei (evertors)	Head / Base of V metatarsal
alf muscles (plantar flexors)	Heel

ULCERATION DUE TO MUSCLE IMBALANCE

- **Complete Dropped Foot- Antero-lateral border**
- **Dropped Foot (Perone intact) – Antero-medial border**
- **Claw toes – Dorsum and pulp of Toes Metatarsals heads**

Deformities due to muscle imbalance are passively correctable but become fixed due to contracture of TA Joint capsule and fibrosis of subcut. tissue

ULCERS IN FIXED DEFORMITIES

- **Shortened Equinus Foot – Anterior Border**
- **Inverted Foot: Destruction Lateral Ray – Lateral Border**
- **Shortened foot with Destruction of medial Ray – Anterior Border**
- **Shortened Plantigrade Foot – Anterior Border**

Bone and joint changes apparent

- concentric atrophy

-absence of distal part of MT

-rarefaction of bone

HEEL DEFORMITIES

Heel Multiple sinuses

Osteomyelitis, septic arthritis, Neuropathic disintegration of Subtalar joint

Calcaneus Deformity – Heel

DEFORMITY DUE TO JOINT NEUROPATHY

Centre of sole or Instep

Sole convex, flattening of medial arch, descent of Talus & Navicular

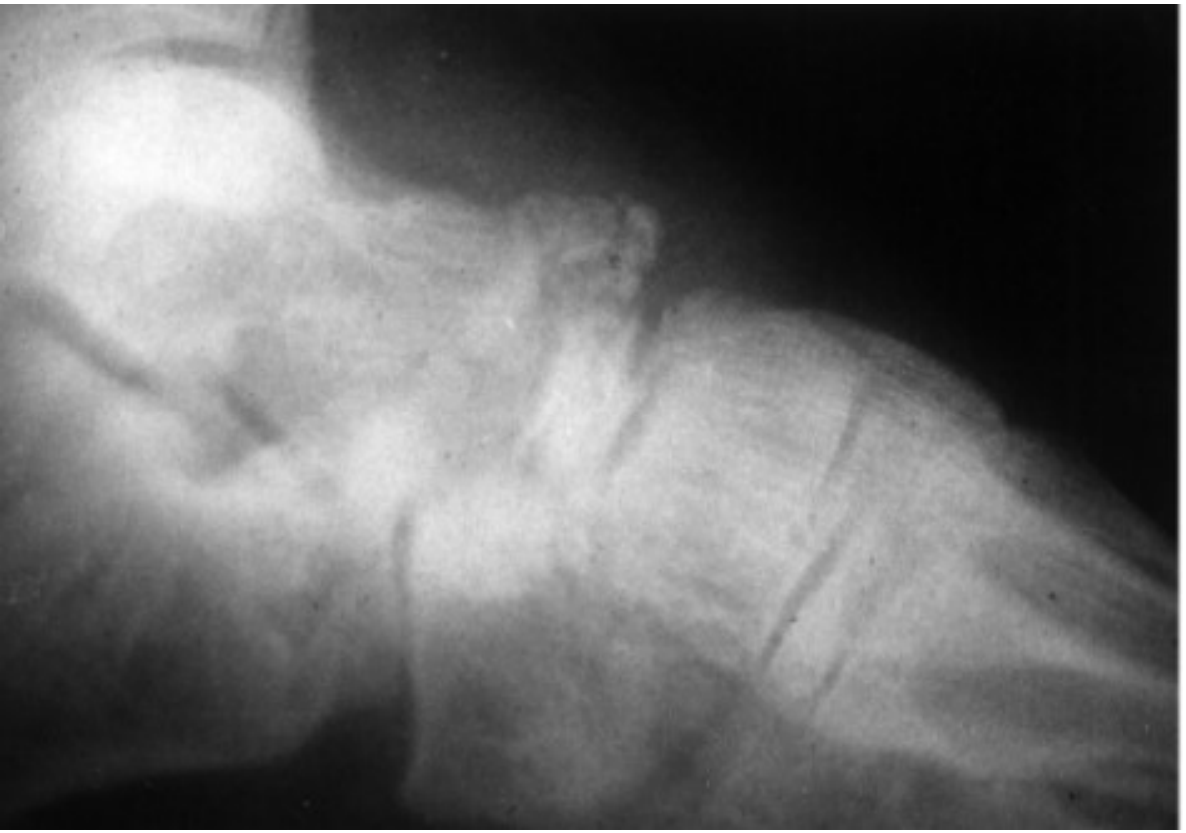
Patterns of Disintegration

- **Posterior pillar**
- **Central (body of talus)**
- **Anterior pillar- medial arch**
- **Anterior pillar- lateral arch**
- **Cuneiform-metatarsal base**

STAGES IN NEUROPATHIC BONE INTERGRATION

- STAGE OF DISINTEGRATION

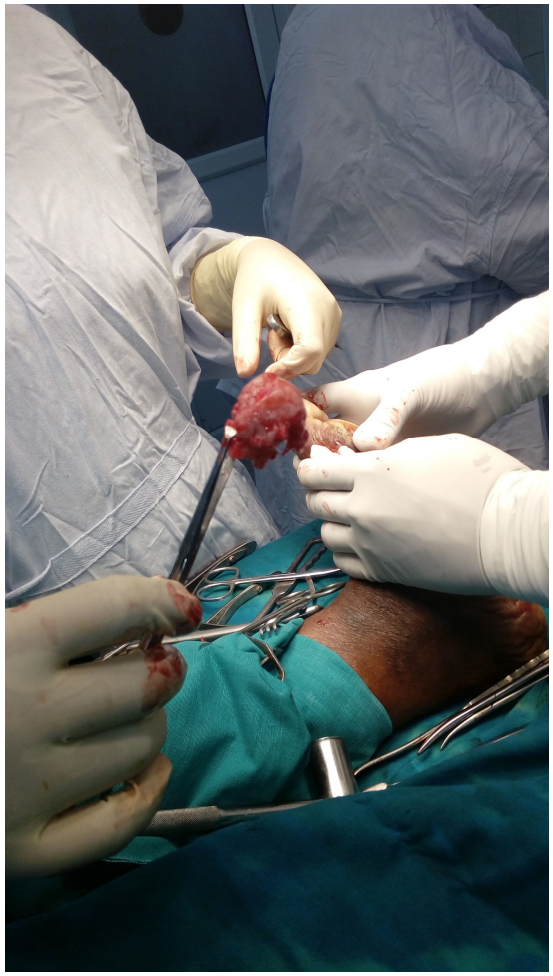
STAGE	RADIGRAPHIC FINDINGS	CLINICAL FINDINGS
I (DEVELOPMENT)	OSTEOPENIA, FRAGMENTATION, JOINT SUBLUXATION OR DISLOCATION	SWELLING, ERYTHEMA,WARMTH, LIGAMENTOUS LAXITY
II (COALESCENCE)	ABSORPTION OF DEBRIS, SCLEROSIS, FUSION OF LARGER FRAGMANTS	DECREASED WARMTH, DECREASED SWELLING, DECREASED ERYTHEMA
III (RECONSTRUCTION)	CONSOLIDATION OF DEFORMITY, JOINT ARTHROSIS, FIBROUS ANKYLOSES, ROUNDING AND SMOOTHING OF BONE FRAGEMENTS	ABSENCE OF WARMTH, ABSENCE OF SWELLING, ABSENCE OF ERYTHEMA, STABLE JOINT +/- FIXED DEFORMITY



AIMS OF TREATMENT FOR FIXED DEFORMITIES

- **Restore all the available plantar surface to its weight bearing fn**
- **Relieve scared areas from weight bearing and Shearing stress**
- **Correct and stabilize the deformity by bone surgery or tendon transfer or Tenotomy**
- **Modify excessive anterior push off pressures and protect the foot by suitable shoes**






TOTAL CONTACT CASTING (TCC)

Early hot swollen foot with no bone lesion(6-8 weeks)

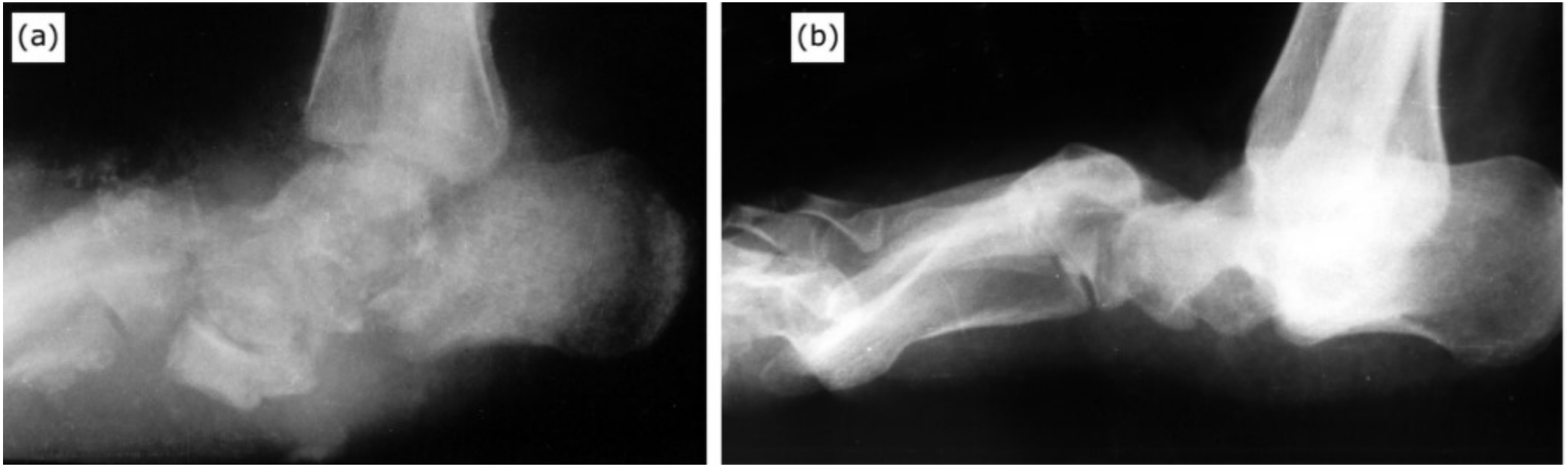
Minimal # without disintegrated(3-4 months)

Major # of tarsal bone but no disintegration(5-6 months)

Definite midfoot fracture with disintegration(8-9 months)

Metatarsal osteotomy or disintegration (6-9 months)

Gross disintegration (12-18 months)

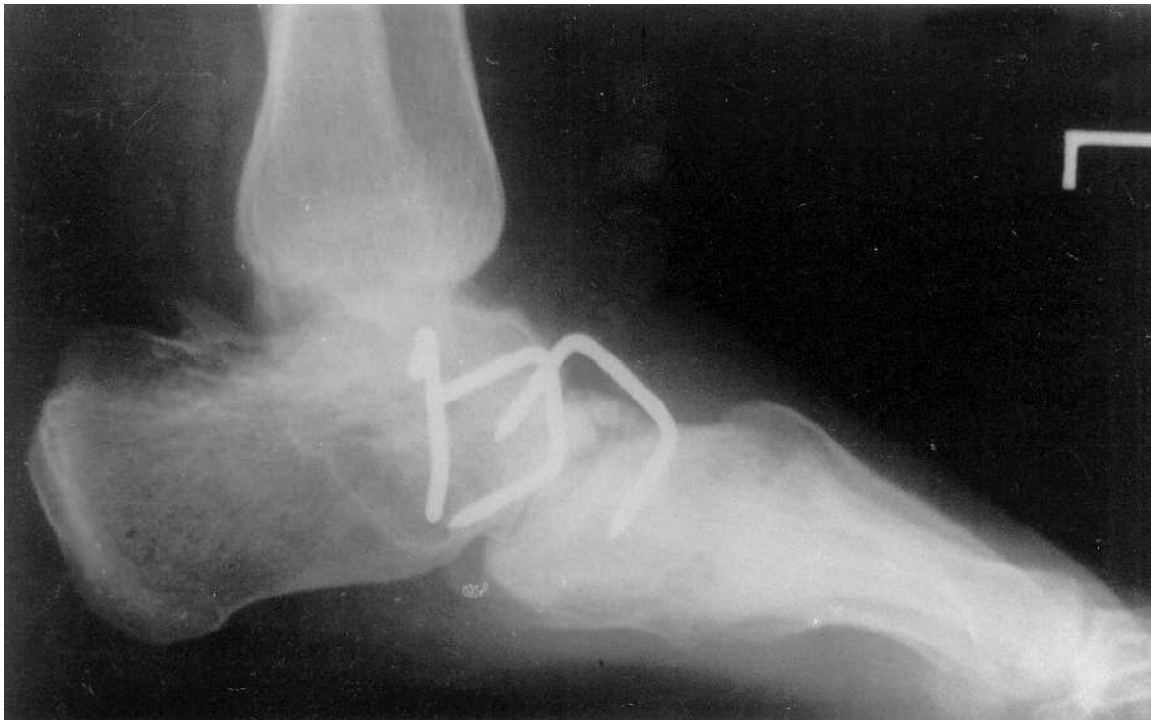

(a)
(b)

SHORTENED EQUINUS FOOT

- **Correction Obtained by Singular two stage short tissue release**
  - ✓**Lengthening of tendoachilles**
  - ✓**Posterior capsulotomy**
  - ✓**Tibialis Posterior transfer**

If ankle function poor

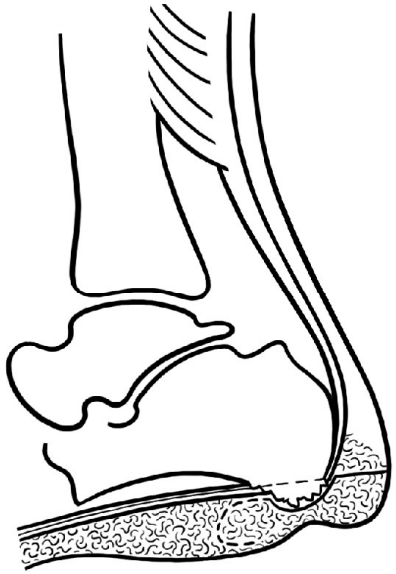
- **Pantalar Arthrodesis**
- **Talectomy**
- **Tibio Calcaneal fusion**



INVERTED FOOT

- **Subtalar Arthrodesis with excision of lateral based wedge**
- **If associated foot drop TP transfer**
  - **If ankle function good Triple arthrodesis with resection of app. Wedge for correction of inversion,**
  - **Lengthening of tendoachilles,**
  - **Posterior capsulotomy,**
  - **Tibialis Posterior transfer**
- **If ankle function poor**
  - **Pantalar Arthrodesis**
  - **Talectomy**
  - **Tibio Calcaneal fusion**

HEEL DEFORMITIES



- **Calcaneal shaving by fish Mouth incision**
- **Sloughening of flap**

<u>Bizarre Heel deformity-</u> due to loss of calcaneum or Talus or parts of both due to osteomyelitis or neuropathy

- **Treatment- Stabilization of the bony remnants**

<u>Calcaneal Deformity-</u> due to excessive tensioning of TPT treated with lengthening of Dorsiflexor and shortening of TA

- **Severe cases -Pantalar arthrodesis**

UNSTABLE SCAR

- **Scar over the normal pressure of the foot – heel, heads of the first and fifth metatarsals**
- **Scars over abnormal pressure points in badly distorted foot**
- **Scars with adherent to bone**

HEEL SCARS

- **Adherent scar without interposition of plantar fascia**
- **Adherent scar through plantar fascia**
- **Depressed scar but with resilient thick margins**

SSG

Successful in only following conditions:

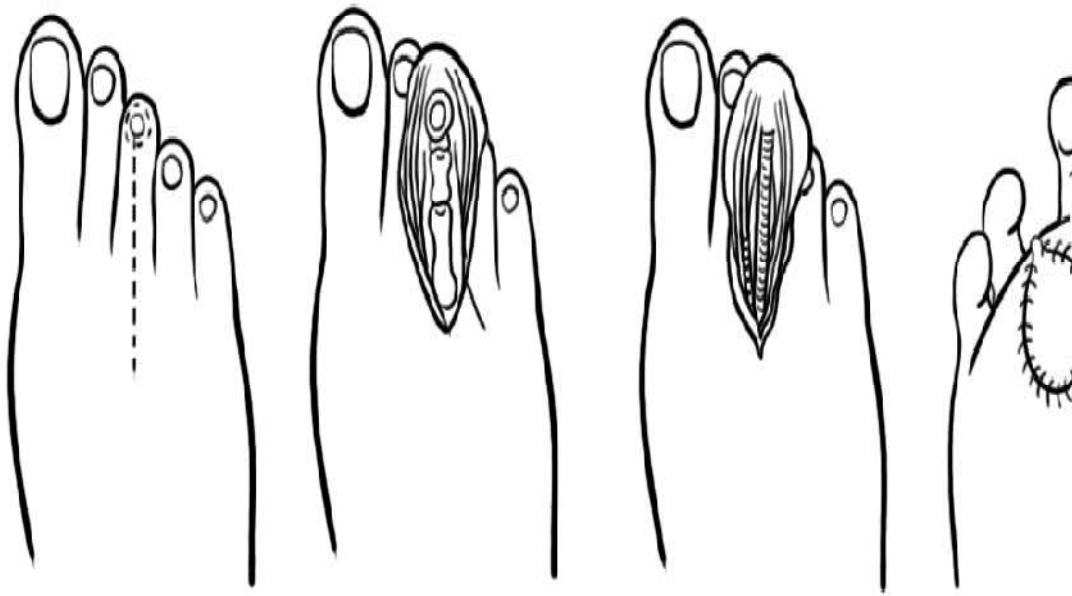
- **Due to loss of skin only eg. Burns**
- **Defects over non weight bearing area**
- **Surface covering after flaps of plantar fascia have been swung to form a resilient bed**

LOCAL FLAPS

- **Always shift non-weight bearing skin to the defect**
- **All flaps should be larger than would be used in non anaesthetic foot**
- **Use large lateral or medial calcaneal flaps whenever possible, as these are based on anatomically constant vessels**
- **Delay on the slightest suspicion of arterial insufficiency**
- **Avoid making incision across weight bearing areas**

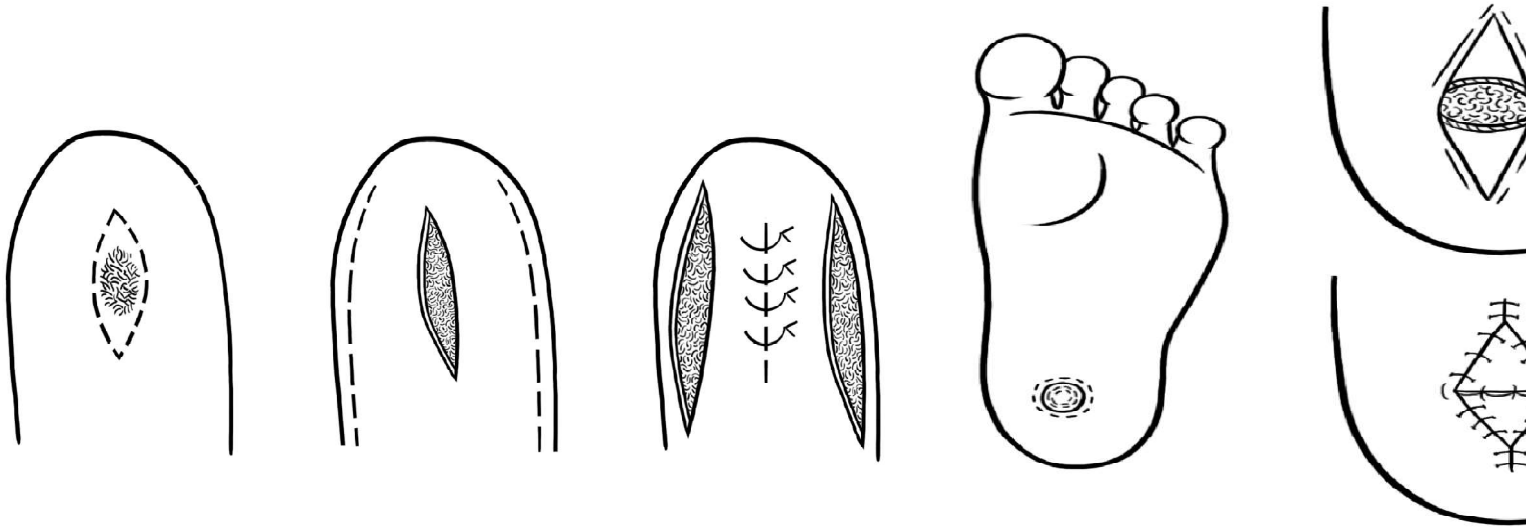
FLAPS FOR FOREFOOT

- **Filleted toe flap**
- **Medial plantar transposition flap**
- **Excision of all metacarpal heads**
- **Trans metatarsal amputation**



FLAPS FOR HEEL

- **V-Y Plasty**
- **Medial and lateral calcaneal flaps**
- **Bipedicle local flap**
- **Distant flaps**
- **Cross leg flap**



ACHILLES TENDON LENGTHENING

- **Equinus contracture**
- **Recurrent forefoot ulceration**
- **Fore foot deformity**
- **Acute stage 1 deformity**

OSTEOTOMY/ EXOSTECTOMY

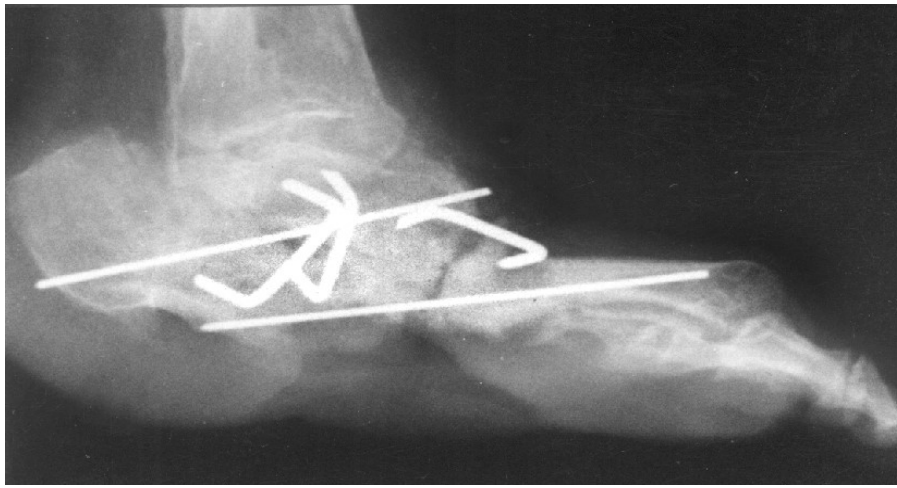
- **Recurrent ulcerations**
- **Bone pressure**
- **Foot deformity**
- **With bone quality amenable**
- **Non infected wounds**
- **Infected ulcerations**

DEBRIDEMENT

- **Infected ulcerations**
- **Recurrent ulcerations**
- **Failure of non-operative treatments**
- **Bone pressure**
- **Non infected wounds**
- **History of foot and /or ankle osteomyelitis**
- **Eradicated soft tissue infections**
- **Immunocompromised**

ARTHRODESIS WITH DIFFERENT TECHNIQUES

- **Instability**
- **Recurrent ulcerations**
- **Foot deformity**
- **Failure of non-operative treatments**
- **Malunions/ non-unions**
- **Salvage of previous failed intervention**
- **Severe pain**
- **Acute stage of deformity**
- **Infected ulcerations**
- **Bone pressure**
- **Large bone loss/defects**



AMPUTATIONS

- **Dead, Dying ,Damn nuisance**

Levels of amputation

- **Trans metatarsal**
- **Lisfranc's amputation**
- **Syme's amputation**
- **BK amputation**

GOVT. INCENTIVE FOR MAJOR RCS

- **Rs.5000/- after undergoing the RCS.**
- **Rs.1500/- 4-6 weeks after operation.**
- **Rs.1500/- 3 months after operation.**
- QUALITY INDICATOR FOR RCS SURGERY**:**

$$\frac{\text{No. of cases with improved functional ability at 6 months after operation x 100}}{\text{Number of case operated upon during the cohort period}}$$

RCS CAMP-2 types

1. Disabled patients are rendered services

Referral and Identification of patient in need of RCS

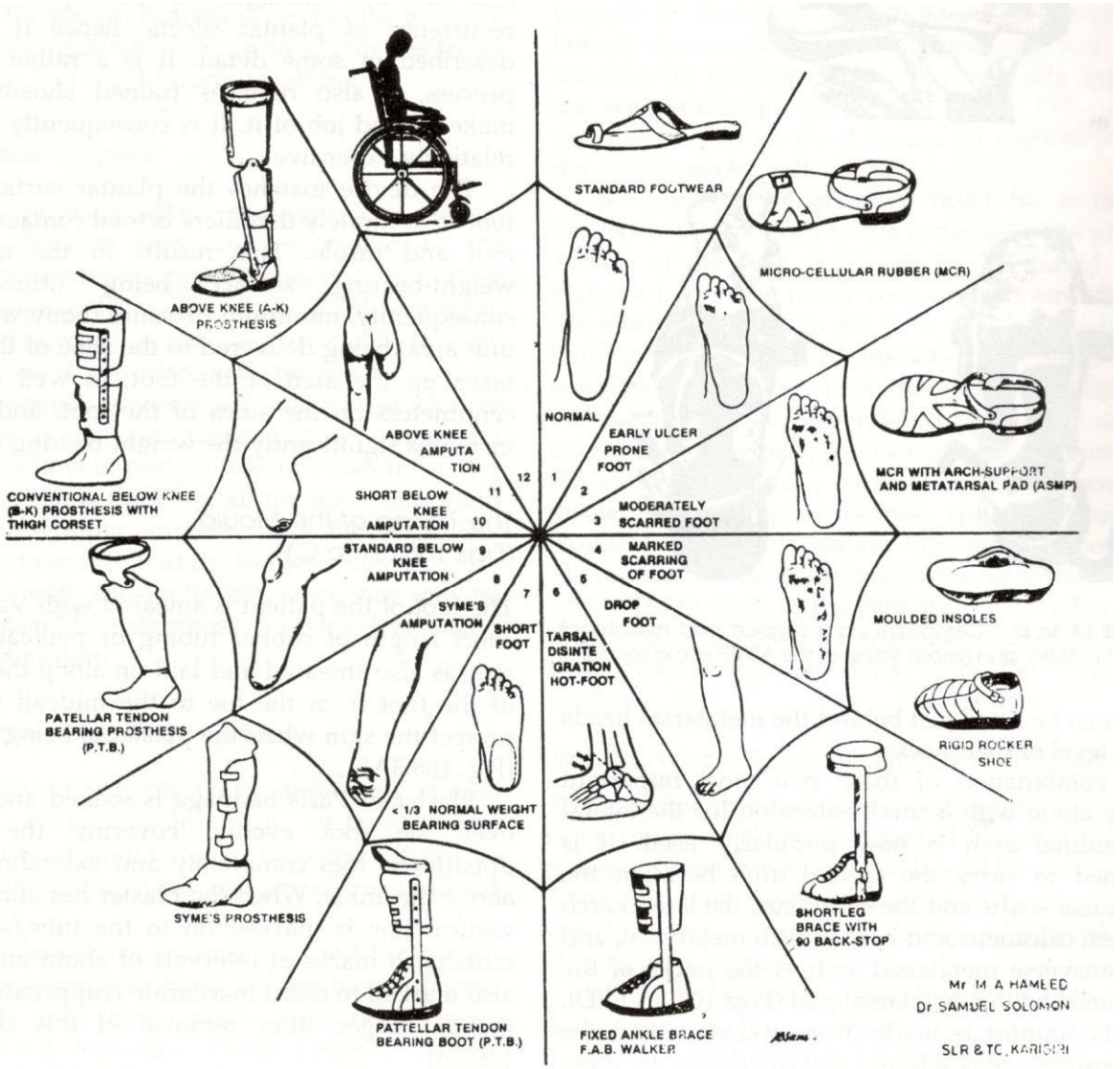
2. Training of local surgeons at their own setup by sending a team of surgeons and holding the RCS camp, where in few demonstration cases are performed.

POD CAMP ACTIVITIES

- **Provide health education for all patients**
- **Demonstrate self-care of feet, hands and eye**
- **Carry out examination of new patients with deformities for baseline assessment.**
- **Early detection and treatment reaction and neuritis**
- **Select patients for RCS.**
- **Fit appropriate footwear and/or protective devices.**
- **Teach home based ulcer care for simple ulcers.**

SELF CARE KIT

- **Foot scraper about 20x6x3 cm scraping surface**
- **Antiseptic liquid or antibiotic skin ointment**
- **Moisturizing cream or Vaseline**
- **Sterilized gauze packs of 5x5 cm**
- **Bandages 3” width x 3 meter**
- **Adhesive tape**
- **Plastic tub 20 inch dia and 8 inch height**



Mr M A HAMEED
Dr SAMUEL SOLOMON

SLR & TC, KARIKARI

Thank You