# A Young Woman from the Cloud Forest

INSTITUTE OF TROPICAL MEDICINE ANTWERP

**Sami Alcedo**

TropiCare Consortium Meeting · June 17, 2026

# The patient

**22 year-old**

**33 weeks pregnant**

## Oxapampa, Peru

Andean cloud forest — remote, low-resource setting, ~2000masl

Presented to the local clinic with **abdominal pain**.

*The leg and hand findings were noticed incidentally — she had not sought care for them.*

# Context: Oxapampa, Pasco, Peru


CLINICAL EXAMINATION

# Ectoscopy

Both lower limbs — bilateral lymphedema

Nodular 'mossy' foot masses

## DEFORMITIES

- Massive bilateral lower-limb elephantiasis, below the knee
- Lobulated nodular masses and hyperkeratotic plaques on the feet
- Fixed equinus deformity of the foot

# Clinical examination

## Pale

Clinically anemic.

## Pregnant 33w

Very frequent contractions

## Neurologic exam

Loss of sensation in all affected areas on monofilament testing

## Peripheral nerves palpated (right leg)

Assessment of nerve trunks for thickening.

THE CLINICAL COURSE

# An Obstetric Emergency

## OB/GYN status

Assessed as pre-term labor requiring a higher level of care.

→

## Transfer

Transferred to the Regional Hospital Access to Specialist through Telemedicine

# At Regional Hospital

| | |
|---|---|
| **Blood count** | Moderate anemia. |
| **X-rays** | Hands, feet, ankles and legs. |
| **Biopsies → Lima** | Hands and feet sent for histopathology + PCR. |
| **Slit-skin smear** | Done in both feet |

EXTENDED ANAMNESIS

# History — What We Could Gather

**Limited history:** the patient speaks only Yanesha — obtained via interpreter.

### Bed-ridden ~5 years

Progressive immobility from the limb disease.

### ~10-year course

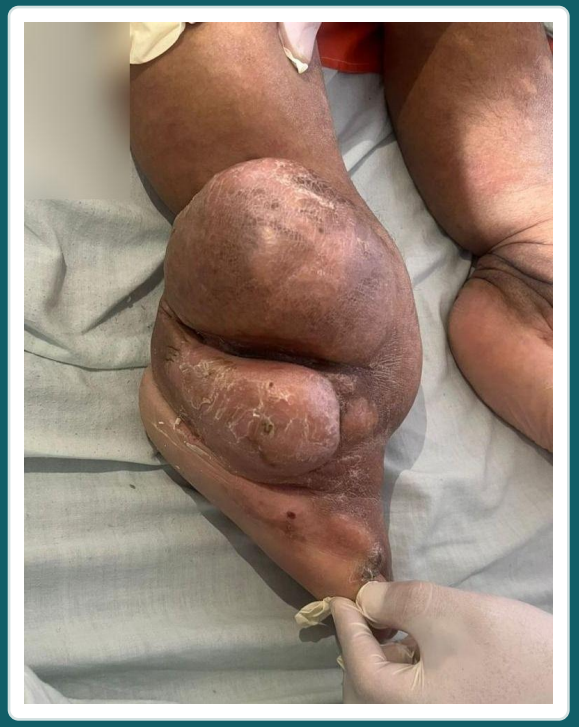
Very slow, insidious progression.

### Lives on village outskirts

Rural, barefoot, low-resource environment.

### Occupation: clay pottery

# The Lower Limbs in Detail



Nodular mass; hyperkeratotic plaques

Verrucous skin, mottled pigment

Lobulated mass, deep folds, scale

**Right: Loss of sensation, both, proximal strenght OK, distal: abnormal bilaterally**
**All findings below the knee. Crusted areas over bony prominences = secondary trauma / ulceration.**

# Hand examination

Dorsum: nodularity, nail dystrophy, shortened digits

- **Gradual loss of fingers over ~5 years**
  Slowly progressive, painless shortening.
- **Distal phalangeal resorption**
  Radiographically confirmed bone loss.
- **Hypopigmented skin over the dorsum of the hand**
  Subtle dyspigmentation in affected areas.
- **Chronic remodeling, not aggressive destruction**
  Smooth, indolent osteolysis — a neuropathic pattern, not an infective/tumoral one.

IMAGING

# Initial X rays — Legs & Hands

## Lower limbs

- Massive circumferential soft-tissue swelling of distal leg, ankle and foot with lobulated masses
- Chronic tibiotalar subluxation with fixed equinus
- No osseous destruction; diffuse disuse osteopenia; bone architecture preserved

## Hands

- Multiple distal phalangeal resorption
- Terminal tuft resorption
- Shortened fingers
- Subluxation

IMAGING

# Second look X ray — The Two Feet Differ

## RIGHT FOOT

- Absent / resorbed distal phalanges
- Shortened toes
- Possible neuropathic arthropathy
- Possible chronic osteomyelitis changes

## LEFT FOOT

- Preserved phalanges
- Preserved metatarsals
- Massive soft-tissue swelling
- Equinus contracture · little/no osteolysis

***Same elephantiasis on both sides — but bone destruction only on the RIGHT***

# Scenario 1 — Leprosy Alone

**Less convincing as a single explanation**

Leprosy readily explains the neuropathic features —

- ✓ **Neuropathy**
- ✓ **Clawing**
- ✓ **Ulcers**
- ✓ **Bone resorption**

Possible Leprosy-associated lymphedema …but NOT **massive bilateral lobulated lymphedema**

# Scenario 2 — Podoconiosis?? (both legs) + Leprosy (right foot & hand)

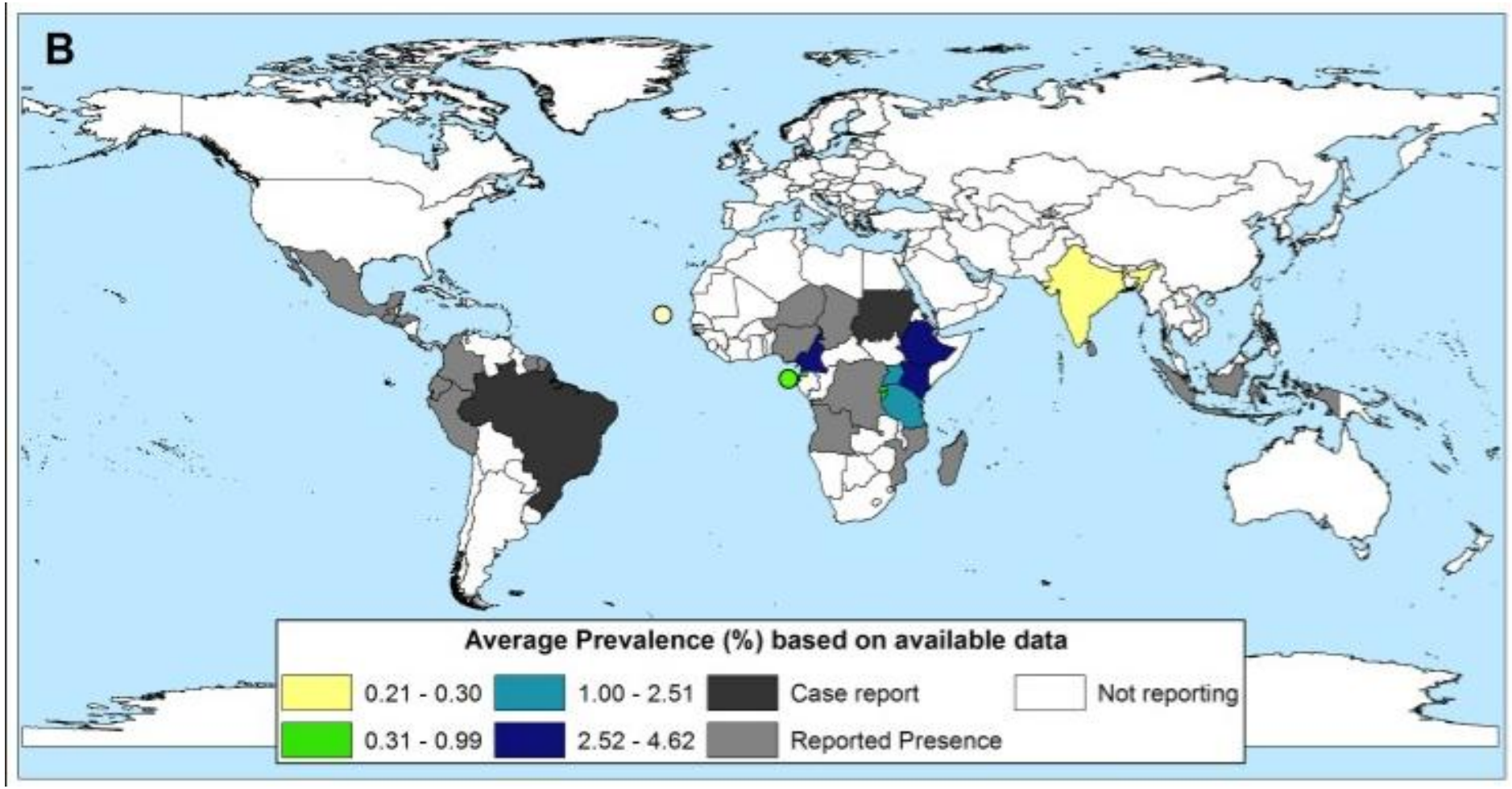
*Non-filarial geochemical elephantiasis*

| Finding | Right | Left |
|---|---|---|
| Severe lymphedema | **Yes** | **Yes** |
| Sensory loss | **Yes** | **No** |
| Toe loss | **Yes** | **No** |
| Bone resorption | **Likely** | **Unlikely** |
| Leprosy neuropathy | **Likely** | **Absent / minimal** |

***Right foot: diminished sensation + toe loss.  Left foot: preserved sensation + preserved toes.***

***Others affected in the community?***

# Scenario 2 —Distribution of Podoconiosis



# Pattern of Involvement

| Feature | Podoconiosis | Leprosy |
|---|---|---|
| Soft-tissue swelling | ++++ | + |
| Elephantiasis | ++++ | Rare |
| Nerve enlargement | No | ++++ |
| Sensory loss | No | ++++ |
| Bone resorption | No | ++++ |
| Auto-amputation | No | ++++ |
| Charcot foot | No | +++ |
| Distal phalanx loss | No | ++++ |
| Plantar ulcers | Rare | Common |

# Other Scenarios Considered

- Filariasis?
- Malignancy?
- Neuropathic ulceration with secondary osteomyelitis, Elephantiasis nostras verrucosa, etc
- Other non-infectious?

# Filariasis in Peru

| Parasite | Present in Peru? | Causes elephantiasis? | Diagnostic test |
|---|---|---|---|
| Mansonella ozzardi | **Yes (Amazon region)** | **No** | Daytime blood smear, PCR |
| *Mansonella perstans* | Rare/questionable reports | No | Blood smear, PCR |
| Lymphatic filariasis | Not considered endemic in modern Peru | **Yes** | CFA antigen test, nocturnal smear |
| Onchocerciasis | Eliminated from Peru | No elephantiasis | Skin snips, serology |

THE CENTRAL QUESTION

# To unify or to not unify this diagnosis?

*Leprosy explains the asymmetry · podoconiosis explains the elephantiasis?*

## RIGHT FOOT

- Diminished sensation
- Loss of toes over ~5 years
- Possible neuropathic osteolysis
- Compatible with leprosy neuropathy

## LEFT FOOT

- Toes preserved
- Sensation preserved
- Severe lymphedema
- Compatible with podoconiosis alone

FURTHER EXAMINATIONS

# Histopathology — By Site

| | | |
|---|---|---|
| **Hand** | **Perineural granulomatous inflammation,** Langhans giant cells, AFB present | ***Strongly supports leprosy*** |
| **Right foot** | Mast-cell-rich chronic lymphedematous dermatitis, hyperkeratosis; no neuritis, **Dilated lymphatics, Mineral deposits in macrophages** | ***Podoconiosis / chronic lymphedema —*** |
| **Left foot** | Mast-cell-rich chronic lymphedematous dermatitis, hyperkeratosis; no neuritis, **Dilated lymphatics, Mineral deposits in macrophages** | ***Supports podoconiosis / chronic lymphedema*** |

**Pathologist rules out malignancy**

# Discriminating Features

| Histopathological feature | Leprosy | Podoconiosis |
|---|---|---|
| Perineural granulomas | +++ | – |
| Langhans giant cells | ++ | – |
| Dense lymphocytic infiltrate | ++ | ± |
| AFB (ZN / Fite positive) | +++ | – |
| Mast-cell-rich infiltrate | – | ++ |
| Hyperkeratosis / cornification | – | ++ |
| Absence of neuritis | – | + |
| Chronic lymphedematous fibrosis | ± | +++ |

DIAGNOSTIC CRITERIA

# Why Podoconiosis Fits

## CLINICAL CRITERIA

- Bilateral (often asymmetric) lower-leg lymphedema
- Barefoot exposure to irritant volcanic / red-clay soils
- Residence in an endemic area
- Onset ascending from the feet
- Groin spared early in disease

## EXCLUDE OTHER CAUSES

- Lymphatic filariasis
- Leprosy********
- Heart failure
- Renal disease
- Hepatic disease
- Primary lymphedema
- Deep venous disease

FURTHER EXAMINATIONS

# The Results Come Back

**Slit-skin smear (hand+right foot)**

**POSITIVE**

Bacilli demonstrated

**Fite-Faraco Stain & PCR — right foot**

**M. leprae +**

RLEP target detected

**Blood smears x3 → rules out filaria**

INVESTIGATIONS

# Summary of Results

| Sample | ZN | Fite-Faraco stain | PAS/GMS | PCR (M. leprae) | TB/NTM Culture |
|---|---|---|---|---|---|
| **Right foot** | Negative | **Positive 1+** | Negative | **Positive (RLEP)** | Negative |
| **Left foot** | Negative | Negative | Negative | ND | Negative |
| **Hand** | **AFB 1+** | **Positive 3+** | Negative | ND | Negative |

*ND = not done. M. leprae confirmed by PCR (right foot) and AFB across hand & right foot; fungal stains and mycobacterial culture negative throughout.*
*GMS: Grocott's Methenamine Silver*

# Thoughts?

BOTTOM LINE

# Two neglected diseases in one patient

**Podoconiosis** drives the bilateral, below-knee elephantiasis — non-infectious, geochemical lymphedema from lifelong clay/soil exposure.

**Multibacillary leprosy** confirmed by histology + PCR; asymmetric neuropathic damage (left foot, hands) but bacilli present bilaterally.

MANAGEMENT

# Treatment

## Leprosy — WHO MDT

- **Multibacillary regimen: rifampicin + dapsone + clofazimine (started Feb, stopped March, May, Restarted June)**
- Watch for type 1 (reversal) reactions & neuritis
- Pregnancy: WHO MDT considered safe
- Nerve care, footwear, wound care; prevent further disability

## Other care

- Foot hygiene, daily washing & emollients
- Compression, elevation
- **SURGICAL**: adenolymphangitis; nodulectomy