## Summary

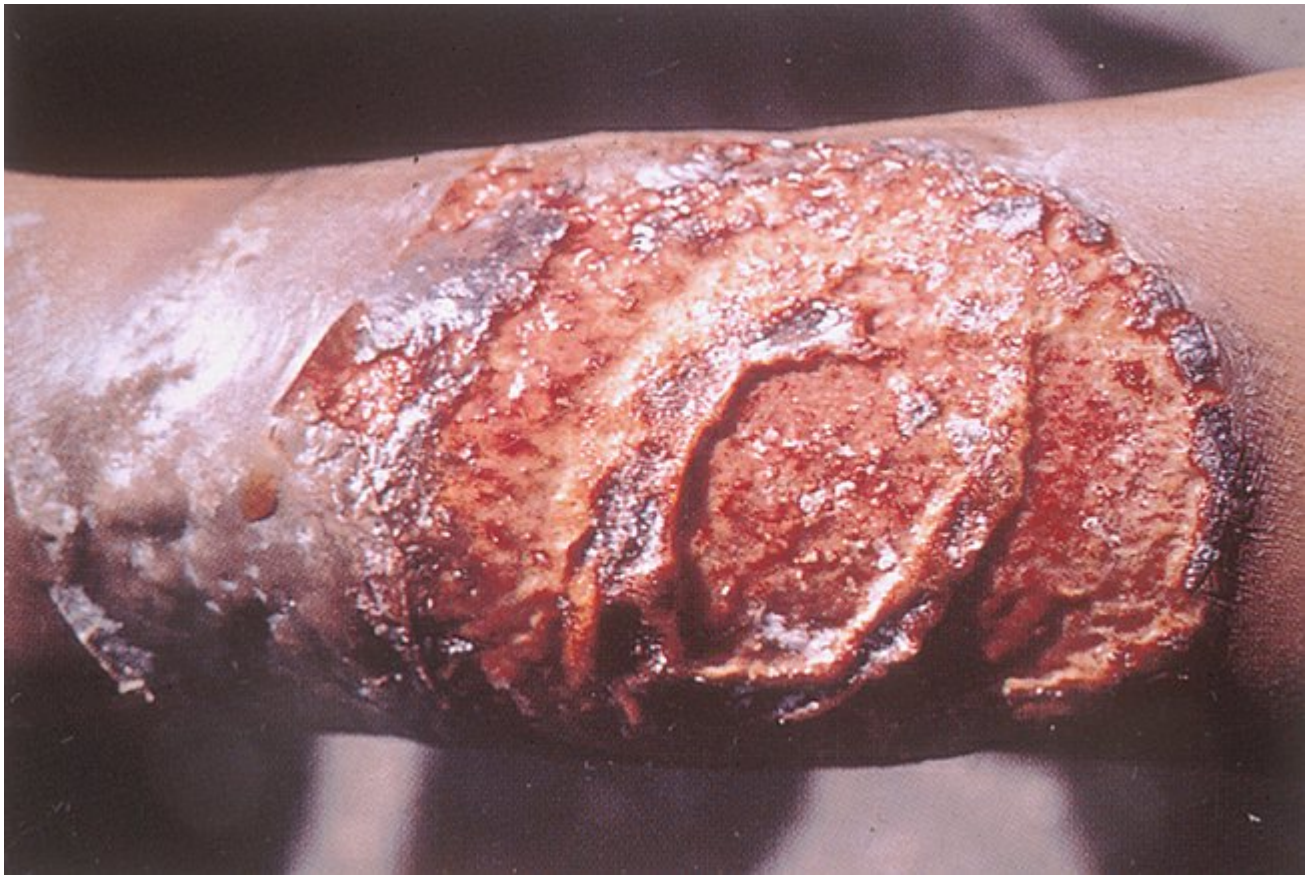
- Fusospirillary association (*Fusobacterium* + *Borrelia*)
- Initially very painful, subsequently painless ulcer on feet or lower leg
- Bad smell in early stage
- Very chronic course with frequent relapses
- Treatment with antibiotics, local care and skin grafts


# Introduction

Tropical ulcer or phagedenic ulcer is a disease of warm and moist geographical regions. There is an association with poor living conditions: lack of clean water, lack of basic health services, carelessness in the treatment of small wounds, abundance of flies, etc. The role of malnutrition and lack of hygiene is clear. For example, in 1942-1945 the disease was extremely common and severe in Western prisoners of war in Japanese camps in Southeast Asia.

In early lesions, Vincent's fusospirillary bacterial association is usually detected: ***Fusobacterium fusiformis*** and ***Borrelia vincenti***. The same organisms are isolated from the mouth in a third of the patients, from which it is deduced that the cause of tropical ulcer might probably be transmitted to small wounds by saliva. In 1989, two new species of *Fusobacterium* were isolated from tropical ulcers but their exact role in the aetiology has not been determined. In more chronic cases the flora is non-specific. The histological presentation is non-specific. It is possible that tropical ulcer is initially caused by a trivial infection or secondary infection with streptococci or staphylococci in an undernourished person.

# Clinical aspects



Tropical ulcers



Tropical ulcer.

The primary localizations are on the lower leg, the front of the ankle and the dorsum of the foot. These are sites where the bone lies immediately beneath the skin and where the blood supply is less extensive. In this respect they resemble stasis ulcers in venous insufficiency. In tropical ulcer there are no signs of venous insufficiency. Ulcers occur less often on other parts of the body. Schematically, the disease progresses in three stages:

**Acute stage:** Local swelling of the skin, oedematous, violently painful and pruritic, sometimes with general symptoms such as fever. A blister with serous or bloody content forms and rapidly bursts. The small ulcer then extends both peripherally and inwards. The patient sometimes reports a recent minor trauma e.g a thorn prick or an insect bite at this site.

**Subacute stage:** On the ulcer, a superficially necrotic, evil-smelling, purulent, yellow-green or haemorrhagic black coating forms. The base is granular and bleeds easily. Deep in the ulcer the tendons, aponeuroses and periosteum can be seen. The edge of the ulcer is raised but with little if any undermining (in contrast to Buruli ulcers). After a few weeks, the ulcer's diameter is on average 10-12 cm. The form is or becomes regular, round or oval. Painful lymphadenitis may be present.

**Chronic stage:** After approximately one month, the swelling and pain decrease. The edge becomes flatter. The base is now coarsely granular, less haemorrhagic and forms less exudate, but the odour persists. Bacteriologically, the flora is now non-specific. Beneath the base of the ulcer there is reactional periostitis in chronic cases. The ulcer gradually heals spontaneously. The longer the disease course, the more difficult healing becomes and the more readily a relapse occurs, as the scar always consists of a small amount of connective tissue lined with fragile, smooth, shiny, often depigmented and atrophic skin. If the lifestyle is not changed, the ulcer flares up again at the first opportunity.

**Complications are numerous:**

Malformations and functional disorders. Scars with fibrosis of the deeper muscles and stiffness of the ankle joint cause all kinds of problems, of which the most common is retraction of the Achilles tendon with club feet of the equinovarus type.

Secondary infection can lead to tetanus, gas gangrene or cellulitis. Thrombosis of the large arteries can result in distal gangrene. Bleeding can occur as a result of erosion of blood vessels.

Osteomyelitis. There is often a limited cortical reactional osteitis. Extensive destruction of the bone under the ulcer is suggestive of cancer.

Carcinoma. Almost always involves spinocellular epithelioma of the skin with a starting point in the border of the ulcer ("Marjolin' ulcer"). Cancer occurs after a prolonged course, whether as the gradual degeneration of an active ulcer or in a scar after one or more recurrent episodes of the ulcer. The cancer then develops in the scar itself but also sometimes in the apparently healthy skin. The edges are partially or completely raised. The base is irregular

and bleeds readily. There is induration and the ulcer becomes irregular. Spontaneous fractures and spontaneous complete amputation of the lower leg can occur. In 85% of cases the ipsilateral lymph nodes are enlarged, but only a third of these by metastases, the remainder as a result of lymphadenitis. Histological examination provides formal diagnosis. The biopsy site must be carefully chosen as not all the ulcer is necessarily degenerated. Metastases in the lymph nodes can also only be confirmed by biopsy.

# Tropical ulcer, differential diagnosis

See differential diagnosis 'Buruli Ulcer'

# Prognosis and social importance

The importance of this rural disease is usually underestimated. Allowance must be made for the following factors:

1. High prevalence, which is rapidly reduced as living conditions are improved: better nutrition, clean water, primary health care services, etc.
2. Numerous health centre consultations for tropical ulcer. The disease takes up much of the personnel's time for treatment, disinfection and bandages.
3. Multiple and long-term admissions.
4. Frequent relapse.
5. Severe invalidity in many patients.
6. High incidence of cancer formation, which is a potentially fatal complication. The risk of cancer formation in a poorly treated or untreated tropical ulcer is estimated at 10-15%.

# Treatment

## Acute cases

Local and systemic treatment with penicillin is indicated. The results are good if the ulcer is recent and its diameter is less than 2.5 cm. Some tropical ulcers heal in 2-3 weeks after administration of metronidazole for 7 days. Metronidazole is effective against anaerobic organisms.

### Chronic ulcers

Antibiotics improve the case but do not heal the ulcer. Immobilisation and local treatment e.g. by bathing with Dakin's solution (aqueous sodium hypochlorite solution) and parenteral antibiotics can result in healing after a few weeks. Effective treatment of a chronic tropical ulcer involves complete excision followed by skin transplants. This can be performed under either general or epidural anaesthesia. The ulcer is curetted until there is diffuse bleeding from the whole underlaying surface. The skin is cut away for up to 0.5 cm at the edges of the ulcer. The underlying bone is vigorously curetted in order to remove sequesters and irregularities and to obtain a flat area. Powder with sulphonamides or antibiotics is then sprinkled on the wound and a pressure bandage applied on top. If the ulcer is next to a joint, this is immobilised with a plaster of Paris. At the same time antibiotics are administered parenterally. After one week the bandage is removed, the wound cleaned, and skin grafts applied. These are obtained with a dermatome from the heterolateral thigh.

In this way up to 90% of tropical ulcers can heal in less than 3 weeks and leave an acceptable scar.

### Malignant degeneration

Treatment consists of conservative amputation with adaptation of the stump for a simple prosthesis. The inguinal lymph nodes are removed for histological examination. These tumours metastasise haematogenous and the prognosis is unfavourable.

## Prevention

Peripheral health centres should provide proper wound care. It is important to promote:

1. Decentralisation of primary health care services which can tend small wounds effectively: antiseptics, simple, clean, non-hermetic bandage, penicillin if necessary
2. Proper diet with sufficient animal proteins
3. Good water supply
4. Health education
5. Monitoring at the workplace of people with tropical ulcer scars or who suffer a

deterioration in their nutritional or health status