ERYTHEMA MIGRANS

Erythema Migrans is a clinical diagnosis which attempts to correlate tick exposure, risk and a rash.

The 8 legged, tiny, questing nymph stage of the tick may be a more likely vector than a large adult.

Questions about the length of time the tick has been in place should be asked, but are but often unknown. Transmission is more likely after 12-24 hours with the tick locked on the human and an exchange of anticoagulant has occurred for the tick’s blood meal.

Method of tick removal is important in the history for the management of the current episode and prevention of future episodes.

Finger nail tick removal and domestic tweezers are likely to encourage bacterial transmission by squeezing it than plastic removal devices which lift off the tick cleanly.

The rash of Erythema Migrans can be very variable.

An initial localized rash around the tick bite is “acceptable” and may represent a human reaction to the tick’s anticoagulant. A photograph at this stage on the patient’s phone is helpful. A planned review in 7 days may avoid an antibiotic prescription and can be safely negotiated with the patient.
Another local reaction around the tick bite site which came up within hours of removing a tick correctly with a twister. The tick had been in place for 8 hours. The local reaction resolved within 3 days.

**Erythema Migrans means migrating rash!**

The classical description is of a 10p size red area round the tick bite and an annular ring, like a target. However, this is not often seen in day to day clinical practice! It can present and fade over a matter of days. Certainly any area of Erythema with a mottled appearance or a watermark edge following a tick bite should make this clinical diagnosis.
The more likely coalesced rash of Erythema Migrans following a tick bite while gardening.
A later 'unimpressive' resolving rash on the knee, at the mottled stage, after a tick bite.

Sometimes a persisting rash on the legs will spread over a large area such as a whole thigh or even an entire ‘red leg’.

**It is helpful to encourage patients to capture their changing rash on their mobile phones.**
Erythema Migrans in a hill runner at 7 days with a clear history of tick bite and delayed removal by fingernails.

Tinny tick from garden removed by meths and fingernails.

Itchy rash at 7 days.

Delayed presentation as “not a bullseye”, flu like symptoms.

Resolution with treatment.
A definite tick bite from an adult tick on a knowledgeable patient.

Removed with a card bevel but had been in place 48 hours as “always getting ticks” near home.

2 days later the left deltoid ached as if in gym and rash presented.

Grip strength left hand 20 kg
Grip strength right hand 32 kg

All symptoms resolved after doxycycline 200mg for 21 days
Grip strength left hand 28 kg
Grip strength right hand 32 kg
Is it erythema migrans or leg cellulitis?

The detailed clinical history of removal and past history is important

This rash on the leg came 48 hours following a tick which had been in place for 4 hours from a local hotspot but was removed promptly with a twister. The history included early allergic type reaction to a wide variety of insect bites which had not resolved with antihistamines. PMH of sepsis and endocarditis from a bite 16 years ago. Current c diff carrier. The central bite was visible. On balance treated as cellulitis with flucloxacillin rather then erythema migrans. Follow up after 7 days.
Body location is important:

Forestry workers who may pick up many ticks on one exposure describe how they are attracted to the groins, armpits and abdomen as well as behind the knees.

**These locations may mean the patient misses a tick or a rash**

The tick may not declare itself until a slight itch happens the next morning in the shower.

Borrellia transmission may take 12-24 hours, so vital time may have been lost while asleep.

Children brushing through bracken at head height will pick up ticks in the hair.

A baby sitting in a garden may pick up a tick in the neck skin folds or nappy area which are common locations for simple rashes.
The rash of Erythema Migrans may disappear in weeks or evolve and persist for months with diagnostic confusion with tinea.

Initial rash with no clear history of a tick bite, but local tick exposure. This could also be early shingles in this position, but no vesicles or pain.

Same patient at 4 months with no response to antifungals.

Same patient at 7 months of persisting rash which was more noticeable after a warm shower and positive Borrelia titres.
**Borellial Lymphocytoma – A8713.00**

Borellial Lymphocytoma is an uncommon manifestation of early disseminated Lyme Borelliosis. In European case reports (ref 1) ‘blue ear’ in a child should raise the clinical question. The differential diagnosis in Scotland includes Atypical Mycobacterial infection of the head and neck (ref 2). In adults Borellial Lymphocytoma has been case reported on a nipple.

![Borellial lymphocytoma in a child's ear](image1)

Persisting bluish skin nodule on leg, after a definite tick bite in a hot spot location. Borellial lymphocytoma
Differential Diagnosis of Erythema Migrans

Tineal infection

Tineal/ fungal infection may occur in the groin and give a ring type appearance. The clinical difficulty is that the ticks are also attracted to the groin.

In a tineal groin infection there may also be signs of athletes feet between the toes.

Erythema Migrans is not usually as itchy as a tini al infection. The itch in erthema migrans is more around the tick bite site.

Tinial infection is very unlikely behind the knees.

Eczema

Flexural eczema can occur behind the knees and in the antecubital fossa. It is unlikely to be a new finding and the skin is likely to feel dry and lichenified.

Discoid or varicose eczema on the ankles or legs may cause diagnostic confusion.
**Contact Dermatitis**

Contact dermatitis is most likely to occur on the hands and would be unusual on the legs or arms. Nickel dermatitis is quite characteristic in appearing beneath watch straps, jewellery, jean studs and belt buckles.

**Psoriasis**

A plaque of psoriasis will be raised and flaky. It is most likely to be present on the elbows and knees or in scar tissue.

**Pigmented Skin**

There is no reliable way of diagnosing Erythema Migrans in pigmented skin. If there is a certain history of tick bite the patient should be offered antibiotics on a balance of probabilities. Serology is unhelpful in the management of Erythema Migrans.

**Erythema Nodosum**

This condition can affect healthy adults and causes red nodules on the legs which may look very similar to Erythema Migrans except they are painful to touch and multiple. They evolve over 2 weeks and may have a target look but no history of tick bite. They resolve in 4-6 weeks may need NSAIDs for symptoms. Causes include the contraceptive pill, sarcoid, TB, strep throat infections and unknown triggers.

**Erythema Multiforme**

This is a condition which also produces a “target rash”. It may be caused by medication or a virus. It may be mild or severe in its effect. It is distinguished from Erythema Migrans by the widespread multiple sites of the targets and likely systemic symptoms and clinical history.

[http://www.nhs.uk/conditions/erythema-multiforme/Pages/Introduction.aspx#causes](http://www.nhs.uk/conditions/erythema-multiforme/Pages/Introduction.aspx#causes)
Shingles.

Tick bites may occur on the back and be difficult to see. Shingles is a herpes zoster rash which classically comes out in a dermatome on the back in a similar position. Shingles declares itself with vesicles and pain, but in the early stages may be similar to Erythema Migrans. The shingles blisters/vesicles will come out over 48 hours.

Immuno suppressed patients

Patients with pre existing medical conditions need to be considered on an individual basis. Patients with long term conditions including rheumatoid arthritis, cancer chemotherapy and multiple sclerosis may be on immune suppressant drugs:

Erythema Migrans after tick was on for 48 hours and removed by domestic tweezers. Rash 7 cm *3 cm at day 3.

Ccurrent treatment with methorexate 15 mg weekly

Doxycline and amoxillin risk interaction with methrexate which was withheld during doxycycline 200mg for 21 days

Treatment of Erythema Migrans

For adults Doxycycline 100mg BD for 3 weeks is usually sufficient but a persisting rash may require 4 weeks.

Compliance with doxycycline is helped by encouraging the patient to take the medicine with food to lessen side effects. Advise sun protection to avoid photo dermatitis.

Amoxicillin and Azithromycin are alternatives.

For children over 9 years doxycycline for 3 weeks with dosage calculation.

Children less than 9 Years and pregnant women see NICE 2018

https://www.nice.org.uk/guidance/ng95/chapter/Recommendations
Consult the lab or Infectious Diseases service if there is treatment resistance or a patient antibiotic sensitivity. BNF editions may not be current with NICE 2018.

**Follow Up**

Record or code Erythema Migrans on a balance of probabilities from history, clinical appearance and response to treatment. The patient should be reassured and no follow up is required as the antibiotics are regarded as curative.

You may wish to use the code ‘suspected lyme disease’ ~JN1.00 if you are uncertain at initial consultation and convert to ‘Erythema Migrans’ # AA41.00 on follow up after treatment.

The patient is likely to read literature on the web and some people get very concerned that a ‘syphilis like’ organism will be invading their bodies. There has to be a balance between strong reassurance and yet safety netting for secondary Lyme Borrellosis symptoms. Secondary Lyme Borrellosis symptoms include a flu like feeling, joint pains and neuropathies.

**Tick Removal**

It is very important to discuss tick removal with the patient in their clinical history and for further episodes. If the tick was in place for more than 12-24 hours the likelihood of borellia transmission is increased.

If the tick was removed by finger nails or blunt tweezers the likelihood of erythema migrans is increased because the stomach contents of the tick may have transferred to the human by squeezing it.

The patient may rationalise previous tick removal with fingernails and no transmission. However, they may not have encountered a borellia infected tick before and ‘got away with it’ using fingernails before.

Advise in future to use plastic tick removal devices with a bevel to lift the tick off without risking squeezing the tiny tick body.
**Do a tick check**

Carry out a thorough tick check at the end of the day.

- Hairline and in hair
- Behind ears
- Back of neck
- Armpits
- Elbows
- Waist
- Groin
- Back of the knees
- Between toes
How to remove a tick:
https://www.youtube.com/watch?v=jAG2wI9EiNM&feature=youtu.be

How to practice removing a tick for fist aiders:
https://www.youtube.com/watch?v=n2wMbkJypfo&feature=youtu.be

How to avoid Lyme Disease:
https://www.youtube.com/watch?v=oCuWVqWdWUE

Lyme Disease at work Forestry commission case histories:

Ref 1: Amschler K, Schon MP, Mempel M, Zutt M.
Atypical location of Lympohcytoma cutis in a child.
Paediatric Dermatology – 30 (5): 628-9, 2013

Ref 2: Fraser L, Moore P, Kubba H.

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