


A Case of Tetanus...





LB

- 4yo boy
- Referred from GP with 12 hour hx:
 - having difficulty opening mouth,
 - difficulty eating,
 - and some drooling
- No fevers, recent viral sx
- Unimmunised- conscious parental choice

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- Awoke 2200 c/o neck pain
 - Noted to have difficulty swallowing
 - “mucusy”

 - Reviewed at Ascot
 - Ulcer noted buccal mucosa
 - Rx Loratidine for congestion

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- That day:
 - Difficulty talking
 - Difficulty opening mouth, only drinking
 - c/o mouth pain
 - 3x episodes of going stiff and arching, c/o abdo pain
 - No fevers and otherwise well
 - Hx: thorn L 3rd toe 2 days prior

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- HR 85, RR 20, Sats 100%, normal BP, afebrile
 - Looked distressed, head tilt
 - Talking through clenched teeth

 - Difficulty opening mouth
 - Unable to visualise tonsils
 - Offensive breath
 - No cervical LN
 - Tense SCM bilat

- CVs/Resp/GI exams unremarkable
- Neuro:
 - Walking
 - Normal tone upper and lower limbs
 - Normal power
- Scab about 1cm L 3rd toe

Medications?

- Past 24hrs taken
 - “durotus”,
 - paracetamol,
 - loratidine
- Mum works pharmacy
 - Didn't think he got into meds
- Concerned that prev owners “P lab”

Differential Dx

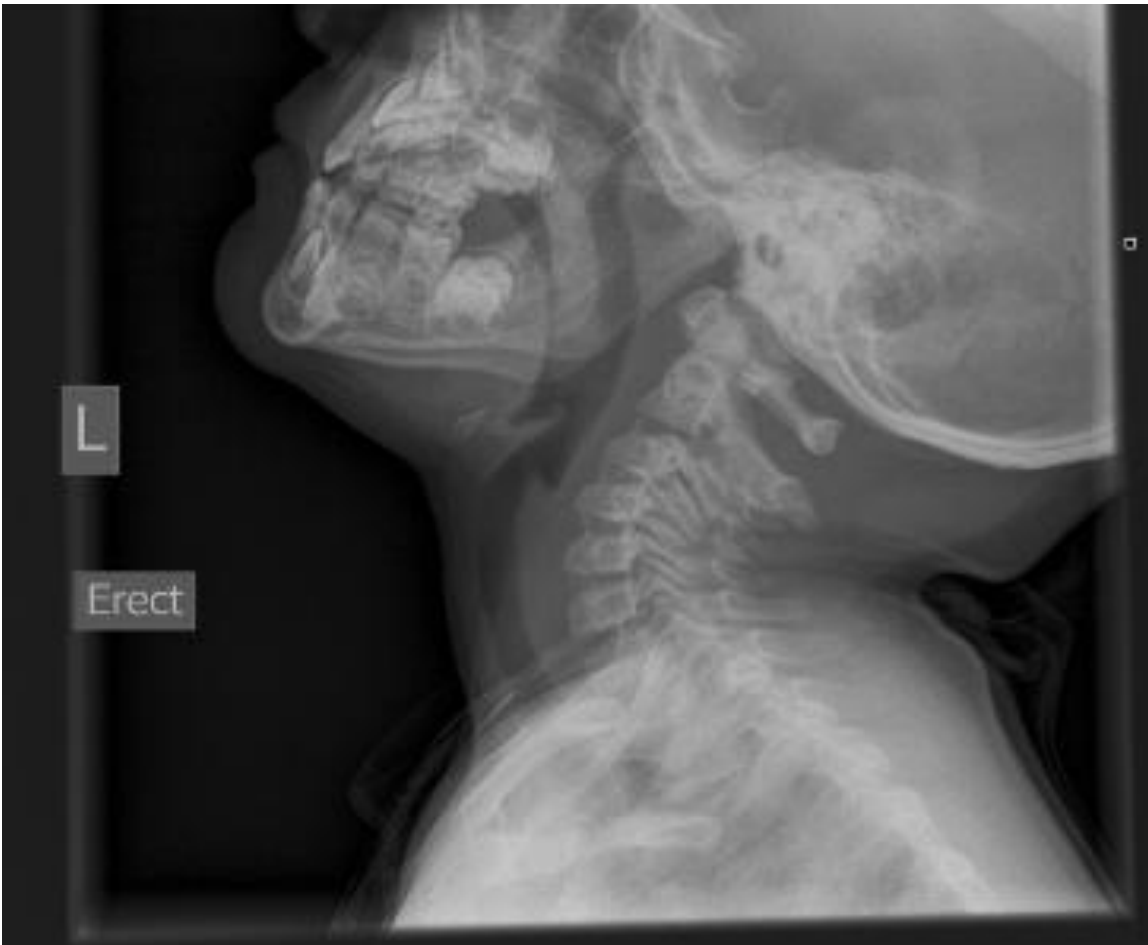
- Dystonic reaction
 - Severe tonsillitis
 - Retropharyngeal collection
 - Atypical seizure
 - HypoCa
 - **Tetanus**
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- Discussion re tetanus
 - Parents reluctant to accept, keen to go home

The Plan....

- Long discussion re benztropine
 - IM dose given
 - No effect
- IV line placed
 - Inflamm markers (CRP, ESR, WCC)
 - UEC and Ca
 - Tetanus IgG, IgM
 - IVF, as trouble drinking
- Lat neck XRay


L

Erect



Progress?

- Hb 118, Plt 313, WCC 8.3, Neut 5.9
- CRP 1.0, ESR 21
- UEC/CMP normal
- No change clinically,
 - mainly clinging to mum
- Episode of arching and tonic stiffening after going to toilet
- Taken few sips, felt would be “happier at home”

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- D/W ID consultant
 - Treat as tetanus
 - IM Tet IgG,
 - IV metronidazole,
 - IV benzo for spasms
 - Long and difficult discussions with parents

Later that evening in ED...

- Worsening spasms occurring every 10-20min
 - Rigid neck
 - Rigid lower limbs, clonus, hyperreflexia
 - Exam triggered spasm with painful back arching
- Reviewed by PICU and Ortho
 - Further hx of puncture wound to foot 2-3 weeks earlier

Admission to PICU

- Midazolam infusion
- Intubated by the morning
- Developed autonomic instability and high fevers
 - Muscle relaxed and cooled
- Magnesium infusion commenced
- Treatment:
 - Orthopaedic debridement of foot wound
 - Further TIG,
 - Metronidazole IV
 - Immunised Day 4

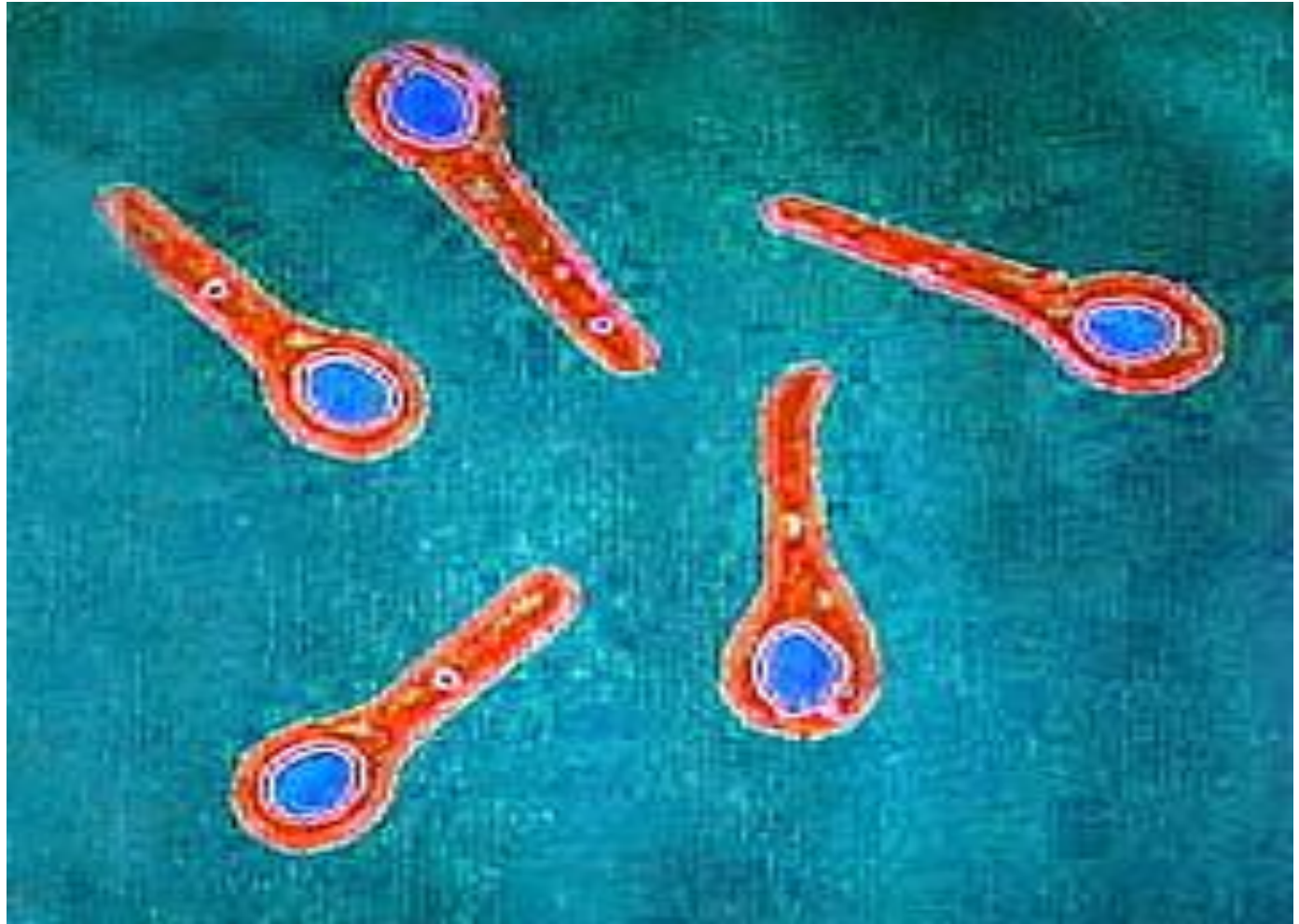
Progress..

- Failed trial extubation at 2 weeks
 - Spasms and discoordinate movements
- Tracheostomy
- PICU stay complicated by LLL pneum, and MRSA PICC line infection
- Discharged from PICU after 3 weeks.
- Trache decannulation 1 month
- Hospital D/C 5 weeks post presentation

1 month later...

- Regular OP physio
- From clinic letter....
 - “Since discharge he has done extremely well and is now back to riding his bicycle and has just progressed to having his trainer wheels removed. The kids received a trampoline for Christmas and he is playing actively on that. Cognitively he seems to be completely back to normal.”

Clostridium tetani



Epidemiology

- NZ: 0.02 per 100,000
- 3 cases in SSH last 10 years
- Females > 60

- Worldwide > 1,000,000 cases/year
 - Up to 500,000 deaths/year
 - Half are neonates – second leading cause of death by vaccine preventable disease

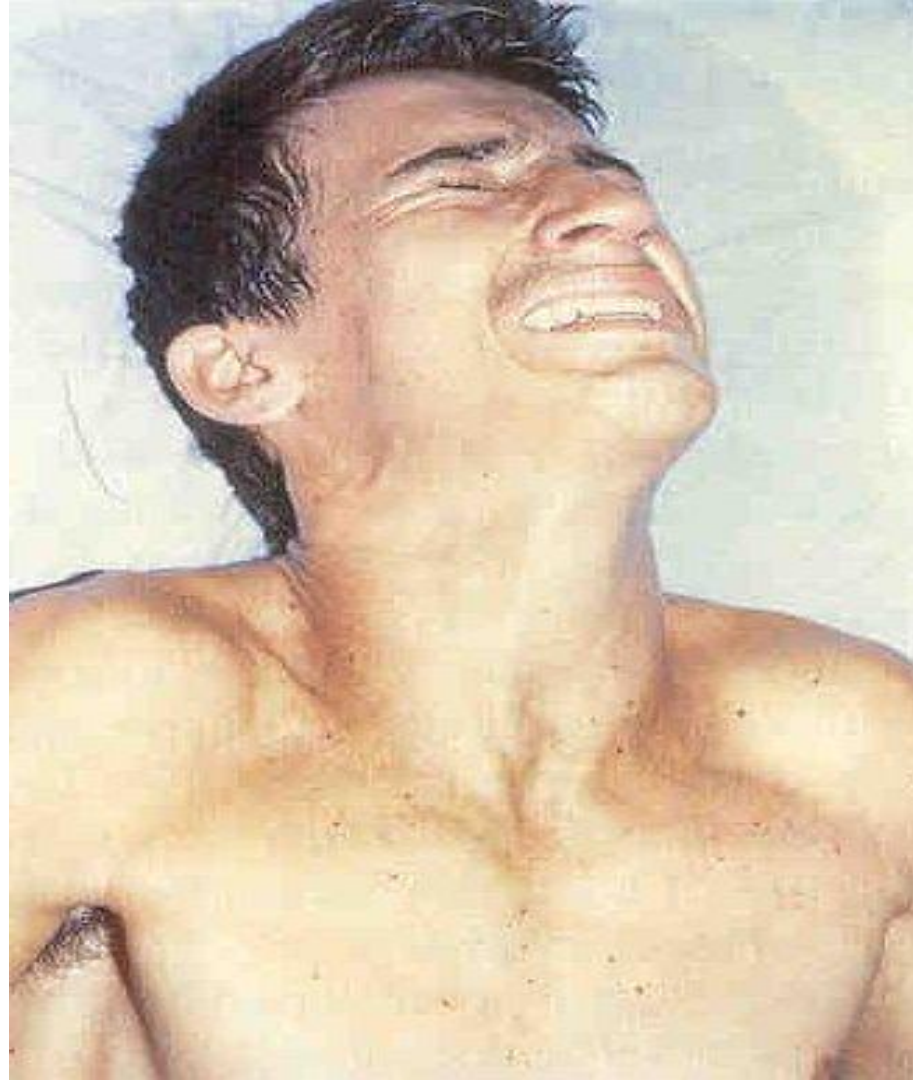
Pathogenesis: *Clostridium tetani*

- Tetanus spores/bacilli introduced into damaged human tissue
- Tetanospasmin
- Axonal transport to SC/Brainstem and binds irreversibly
- Blocks inhibitory neurotransmitters
 - Prevents inhibition of excitatory impulses
 - Increased tone and spasms
- Blocks control of adrenal catecholamines
 - Increase HR, BP, sweaty

Diagnosis

- Injury
- Incubation period 24hrs - many months
- Trismus
- Spasms most prominent in first 2 weeks
- Autonomic disturbance after spasms, peaks in second week
- Rigidity may outlast spasms
- Recovery with regrowth of synapses
 - 4-6 weeks
- Mortality is about 10%

Risus Sardonicus



Opisthotonus



Differential Diagnosis?

- Drug induced dystonias
- Dental infection
- Strychnine poisoning
- Malignant neuroleptic syndrome
- Stiff-man syndrome

Treatment

- Halt toxin production
 - Debride wound, antibiotics
- Neutralise unbound toxin
 - Tetanus immunoglobulin, tetanus toxoid
- Control spasms
- Manage autonomic dysfunction
- General supportive management
 - Early tracheostomy, feed, DVT prophylaxis

Control of Spasms

- Environmental
- GABA_A agonists
 - Benzodiazepines
 - (Propofol)
- GABA_B agonists
 - Baclofen IT
- Neuromuscular blockers
- Magnesium

Managing Autonomic Dysfunction

- Fluid balance
- Sedation
- Morphine
- Combined α and β blockade
- Magnesium

Magnesium

- Pre-synaptic neuromuscular blocker
- Blocks catecholamine release
- Decreases receptor responses to catecholamines
- Causes weakness/paralysis and sedation in overdose
 - ?Duration, dose, target conc

Vaccination

- The vaccine
- Immunisation schedule
- Boosters
- Tetanus immunoglobulin



Questions?

References

- NZ Immunisation Handbook, 2006, MOH
- UpToDate
- Medlink
- Tetanus. Farrar et al. Journal of Neurology Neurosurgery and Psychiatry 2000;69:292-301
- Tetanus in the adult. Trujillo et al. Critical Care Medicine 1980;8(7):419-423
- Tetanus: a review of the literature. Cook et al. British Journal of Anaesthesia 2001;87:477-87
- Intrathecal baclofen for the treatment of tetanus. Santos et al. CID 2004;38:321-327