

原文題(出處)：	Generalized tetanus in a 4-year old boy presenting with dysphagia and trismus: A case report. Cases Journal 2009;:7003
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內文：

Introduction:

1. Tetanus is a neurotoxin-mediated disease characterized by a progressive spastic paralysis of multiple muscle groups.
2. The neurotoxin (tetanospasmin) disrupts neurotransmitter release in inhibitory neurons, leading to peripheral muscle rigidity and spasms.
3. Tetanospasmin is produced by the obligate anaerobic, spore-forming, Gram-positive species *Clostridium tetani*, of which it's spores are ubiquitously distributed in our environment.
4. Muscle rigidity and spasms constitute the typical clinical hallmarks of generalized tetanus e.g. trismus (lockjaw) and opisthotonus
5. The onset of a generalized tetanus infection is not always associated with the clinical signs described above. Tetanus presenting with solely oropharyngeal symptoms can be misdiagnosed as a more common oropharyngeal infection (i.e. peritonsillar abscess).

Case presentation:

The history revealed that the 4-year-old Caucasian boy had recently injured his left hallux. This had resulted in a small local hematoma and loose toenail. There were no recorded insect or animal bites. Based on religious grounds, the boy had not received immunization according to the Dutch National Immunization Program. The other children, including his identical twin, were healthy.		
Hospitalization	Day	
	1~4	general malaise, indolence, mild fever and progressive anorexia.
	5	1. refuse all food and fluids 2. progressive dysphagia, sore throat and sialorrhoea
	6	1. An otorhinolaryngologist had been consulted 2. Peritonsillar abscess. 3. Examination at that time did not provide any clues for an oropharyngeal infection
	7	1. Difficulties with mouth opening 2. Progressive dehydration 3. A pediatrician was consulted
Wilhelmina Children's Hospital	8	1. no cervical lymphadenopathy 2. ear and nose examination was unremarkable. Oropharynx was not possible due to trismus. 3. Tendon reflexes: normal 4. No meningeal irritation. 5. The loose toenail did not show clear signs of inflammation. 6. Hart rate was slightly increased Blood pressure was normal

	<p>Farther clinical examination was unremarkable After being asked to walk, he showed muscle spasms of the back and thighs evidently worsening during examination Intial differential diagnosis:</p> <ul style="list-style-type: none"> i. oropharyngeal infections (e.g. tonsillitis, peritonsillar abscess) ii. botulism iii. rabies iv. strychnine poisoning v. hypocalcemia vi. psychogenic causes vii. tetanus. <p>Based on normal complete blood cell count and chemistry profiles, immunization status and the presence of generalized muscle spasms working diagnosis: generalized tetanus</p>
8	<p>Anti-tetanus immunoglobulins (300 I U. i.m) Amoxicillin (100 mg /kg i.v.) Intubated and mechanical ventilation Transferred to Pediatric intensive care unit (PICU) Metrodazole (30 mg/kg/day i.v.) for fallowing 10 days</p>
9	<div style="text-align: center;">  <p>Figure 1A</p>  <p>Figure 1B</p> </div> <p>Surgical debridement of the left hallux toenail Anti-tetanus immunoglobulins (300 I U. i.m)</p>
13	<p>Blood and wound cultures were negative for C. tetani. During the entire stay at the PICU repeated cultures of blood, urine and tracheal aspirates remained negative White blood cell counts remained unremarkable</p>

		CRP levels increased to a maximum of 63 mg/L
	15	Active immunization DTP was started Muscle spasms and trismus significantly worsened in frequency and severity Dosages of midazolam and morphine (i.v.) were increased Clonidine and lorazepam were added to the regimen
	19	creatine kinase levels : 945 U/mL [reference value: 15–175 U/mL]
		<p>The graph displays two data series over a 19-day ICU period. The left y-axis represents CRP (mg/L) from 0 to 75, and the right y-axis represents CK (U/L) from 0 to 1000. The x-axis is ICU day. CRP (solid line with circles) starts at ~10 mg/L, peaks at 63 mg/L on day 6, and returns to baseline by day 14. CK (dashed line with triangles) starts at ~150 U/L, peaks at 945 U/L on day 12, and returns to baseline by day 14. TIG (black bar) is administered from day 1 to 3. Metronidazole (grey bar) is administered from day 1 to 11. Mechanical ventilation (brown bar) is used from day 1 to 14.</p>
	22	Haloperidol Muscle spasms and anxiety decreased Gradual weaning off sedatives was started.
	23	Uneventful extubation Two short periods with increased muscle spasms occurred thereafter, which were successfully treated with diazepam.
Regional hospital	28	He was transferred back to the referring hospital

Discussion:

1. General tetanus infection is rare in developing countries, because of national immunization programs
2. Patients in developing countries are more likely to present with progressed and unambiguous symptoms i.e. severe spasms of the facial musculature (risus sardonicus) and opisthotonus.



3. Challenge of diagnosing generalized tetanus infection in the mere presence of dysphagia and trismus, which is accompanied by an undiminished risk of rapid clinical deterioration.

	General tetanus	Cephalic tetanus	Tetanus
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			neonatorum
	The most common form	A variant of localized tetanus	Initial infection of the umbilical stump
Character	Trismus or lockjaw Risus sardonicus Opisthotonos	The poorest prognosis of localized tetanus	The mortality in infants exceed 90%

4. Treatment:
 - (1) Debridement of the primary wound
 - (2) Metronidazole and penicillin have equivalent activity against *C. tetani*
 - (3) Passive innunization with human immunoglobulin
 - (4) Vaccination with tetanus toxoid
5. In fact, the most contributing factor to reduce mortality from generalized tetanus is treatment within modern (pediatric) intensive care units (ICU) with aggressive sedation protocols and advanced ventilatory support
6. Autonomic dysfunction remains the major clinical challenge, as hypotension, arrhythmia and cardiac arrest are important predictors of fatality

Conclusion:

The diagnosis of generalized tetanus in children remains a diagnostic challenge in developed countries, as the classical symptoms may be absent at presentation. Early recognition and immediate initiation of advanced critical care are necessary to prevent rapid clinical deterioration. Therefore, the differential diagnosis of non-immunized children with an acute onset of dysphagia and trismus should always include generalized tetanus

題號	題目
1	Which statement about tetanus is right? (A) The pathogen is an aerobic, spore-forming, Gram-positive rods (B) In-utero infection will not occur (C) oropharyngeal symptoms is rare in generalized tetanus in developed countries (D) Culture results are the gold standard for tetanus diagnosis
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題號	題目
2	Which statement of treatment of tetanus is right? (A) Vaccination with tetanus toxoid (B) Debridement of the primary wound is unnecessary (C) Amoxicillin is the optimal antibiotic for treating tetanus (D) The use of human tetanus immunoglobulin is questionable
答案()	出處：Medical microbiology 5 th edition P.408~P.409 Murry,Rosenthal, pfaller