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CASE STUDY

CONTENTS

Cephalic tetanus progressing to generalized tetanus after facial trauma in an unvaccinated elderly patient: A case report

Anton I. Kohutych[1,2], Andriana A. Halamba[1], Vlasta V. Vysochanska[1,2], Monika T. Maroshan[2], Oles S. Vakarov[1]
[1]UZHHOROD NATIONAL UNIVERSITY, UZHHOROD, UKRAINE
[2]REGIONAL CLINICAL INFECTIOUS DISEASES HOSPITAL, UZHHOROD, UKRAINE

ABSTRACT
A 67-year-old unvaccinated male patient was analyzed. Clinical manifestations, laboratory and imaging findings, treatment, and disease progression were evaluated using hospital records.
Eight days after facial trauma from a bicycle accident, the patient developed progressive trismus, dysphagia, neck stiffness, and respiratory discomfort. He was hospitalized on day 10 post-injury. Initial treatment included 500 IU of tetanus immunoglobulin. Two days later, his condition deteriorated with progression to generalized tetanus, requiring ICU admission. Additional 2000 IU of tetanus immunoglobulin, sedation, and oxygen therapy were administered. The course was complicated by pneumonia. Gradual improvement occurred, and he was discharged in stable condition on day 35.
Cephalic tetanus is a rare but severe form that may progress to generalized disease. Early recognition and prompt administration of tetanus immunoglobulin are crucial for favorable outcomes.

KEY WORDS: tetanus; cephalic tetanus; trismus; case report

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INTRODUCTION

Tetanus is an acute, potentially fatal disease caused by the neurotoxin tetanospasmin produced by *Clostridium tetani* [1,2]. The incidence has dramatically decreased due to vaccination programs; however, sporadic cases continue to occur, particularly in elderly populations with incomplete immunization [3].

Cephalic tetanus, a rare variant, involves cranial nerves and is usually associated with head and neck injuries or infections [4,5]. Its early presentation may include trismus, dysphagia, facial muscle spasms, and cranial nerve palsies [6]. Despite early recognition, cephalic tetanus often progresses to generalized disease, which carries significant risk of respiratory failure and death [7,8].

Given its rarity and potential severity, reporting detailed cases contributes to improved recognition, management, and outcomes, particularly in vulnerable populations. This report describes a case of cephalic tetanus following facial trauma that progressed to generalized tetanus, highlighting clinical course, management, and literature comparison.

CASE REPORT

A 67-year-old male patient was admitted to the hospital with complaints of inability to open the mouth, difficulty chewing and swallowing, neck muscle rigidity, headache, generalized weakness, and dyspnea that worsened in the supine position.

Clinical evaluation: Neurological and physical examination, vital signs, laboratory tests (CBC, liver/kidney function, CRP, urinalysis), and imaging (CT brain/cervical spine).

TREATMENT INTERVENTIONS:

Immunotherapy: 500 IU tetanus immunoglobulin (Day 10 post-trauma), additional 2000 IU after deterioration (Day 13);

Pharmacotherapy: Metronidazole, cefazolin, moxifloxacin, fluconazole, baclofen, magnesium sulfate, sedatives;

Supportive care: Oxygen therapy, ICU monitoring, nasogastric feeding, airway management.

Follow-up: Monitoring until Day 35 post-trauma for neurological recovery, trismus resolution, respiratory function.

ETHICS

Written informed consent was obtained from the patient for publication of this case report and accompanying clinical information. All procedures performed in this study were conducted in accordance with the ethical standards of the institutional and national research committees and with the principles of the Declaration of Helsinki. Patient have sighned an ethics statement that ensures informed consent, confidentiality, and respect for autonomy. It confirms that the patient voluntarily agreed to participate in research or treatment, understands the risks/benefits, and has consented to the use of their data or images, adhering to ethical standards

CASE

Ten days before hospitalization the patient sustained facial trauma after falling from a bicycle. The wound was treated at home with antiseptic solutions without medical consultation.

Eight days after the injury the patient developed progressive trismus, difficulty chewing food, dysphagia, and neck stiffness. Because of worsening symptoms, the patient sought medical care and was hospitalized.

The patient had no documented history of tetanus vaccination.

At admission the patient's condition was assessed as moderate. Neurological examination revealed marked trismus, increased tone of the cervical muscles, and difficulty swallowing.

Laboratory examination showed leukocyte count of 9.8×10^9/L with elevated inflammatory markers. Biochemical analysis demonstrated increased liver enzyme levels (ALT 860 U/L, AST 950 U/L).

Computed tomography of the brain revealed signs of chronic dyscirculatory encephalopathy. Chest radiography showed features consistent with chronic bronchitis.

Tetanus immunoglobulin (500 IU) was administered after admission.

However, three days later the patient's condition deteriorated with increasing generalized muscle rigidity and respiratory distress. The diagnosis was revised to generalized tetanus.

The patient was transferred to the intensive care unit where additional tetanus immunoglobulin (2000 IU) was administered. Sedation therapy and oxygen support were initiated.

On the 17th day after trauma the clinical course was complicated by pneumonia.

Table 1. Timeline of disease progression

Day	Clinical event
Day 0	Facial trauma
Day 8	Trismus
Day 10	Hospitalization
Day 11	500 IU tetanus immunoglobulin
Day 13	ICU admission
Day 13	Additional 2000 IU immunoglobulin
Day 17	Pneumonia
Day 35	Clinical improvement

Source: compiled by the authors of this study

Gradual clinical improvement was observed during further treatment, and the patient was discharged in stable condition on day 35 after trauma.

The chronological course of the disease is summarized in Table 1.

DISCUSSION

Cephalic tetanus is one of the rarest clinical forms of tetanus and typically develops after injuries involving the head or face or as a complication of otitis media and other craniofacial infections. This variant accounts for less than 3% of all reported tetanus cases worldwide [1,4]. It is characterized primarily by cranial nerve dysfunction, most commonly involving the facial nerve, and may present with trismus, facial muscle spasms, dysphagia, and neck stiffness [4,6].

In the present case, the first clinical manifestations appeared approximately eight days after the traumatic injury. This incubation period falls within the commonly reported range of 3–21 days described in the literature [1,5]. Shorter incubation periods are generally associated with more severe disease because of the shorter distance between the site of toxin production and the central nervous system [1]. Early manifestations in our patient included progressive trismus and dysphagia, which represent typical initial symptoms of tetanus.

However, these symptoms are nonspecific and may mimic several other clinical conditions. The differential diagnosis of trismus includes temporomandibular joint disorders, odontogenic infections, peritonsillar abscess, dystonia, and other neurological disorders affecting the brainstem [6,7]. Because of these diagnostic challenges, the disease may initially be overlooked, particularly in regions where tetanus has become rare due to effective vaccination programs.

The differential diagnosis of trismus after craniofacial trauma is shown in Table 2.

One of the most important clinical features of cephalic tetanus is its high risk of progression to generalized disease. Previous studies indicate that approximately 60–70%

Table 2. Differential diagnosis of trismus after craniofacial trauma

Trismus after facial trauma	
Infectious causes	Tetanus (including cephalic tetanus)
	Peritonsillar abscess
	Odontogenic infections
Musculoskeletal causes	Temporomandibular joint dislocation
	Temporomandibular joint trauma
	Masticatory muscle spasm
Neurological causes	Dystonia
	Brainstem lesions
	Drug-induced muscle rigidity
Oncological causes	Tumors of the oropharynx or jaw
Inflammatory causes	Osteomyelitis of the mandible
	Severe dental infection
Clinical "red flags" suggesting tetanus:	progressive trismus
	dysphagia
	neck rigidity
	generalized muscle spasms
	absence of vaccination history

Source: compiled by the authors of this study

Table 3. Clinical characteristics of cephalic and generalized tetanus

Feature	Cephalic tetanus	Generalized tetanus
Frequency	Rare (<3% of cases)	Most common form (>80% of cases)
Typical trigger	Craniofacial trauma, ear infection	Contaminated wounds anywhere on the body
Initial symptoms	Trismus, cranial nerve palsy, facial weakness	Trismus, neck stiffness, generalized muscle rigidity
Cranial nerve involvement	Common (especially facial nerve)	Rare
Muscle spasms	Usually localized initially	Generalized spasms and opisthotonus
Risk of progression	May progress to generalized tetanus in ~66% cases	Already generalized
Severity	Variable	Often severe with autonomic dysfunction
Need for intensive care	Sometimes required	Frequently required
Mortality risk	Moderate	Higher mortality risk

Source: compiled by the authors of this study

of patients with cephalic tetanus subsequently develop generalized tetanus within several days after the onset of neurological symptoms [4,8]. Generalized tetanus is characterized by diffuse muscle rigidity, painful spasms, and involvement of respiratory muscles, which may result in respiratory failure and severe autonomic instability [1,2].

The clinical characteristics of cephalic and generalized tetanus are summarized in Table 3.

The clinical course observed in our patient followed a similar pattern. Initial localized symptoms gradually progressed to generalized disease requiring intensive care management. The need for ICU admission highlights the potentially life-threatening nature of this condition even in patients who initially present with moderate clinical severity.

Another important aspect of this case is the delayed presentation to medical care. The patient sought hospital treatment approximately ten days after the traumatic injury. Delayed recognition and treatment are well-known factors associated with more severe disease and an increased risk of complications [3,10]. Early wound management and timely administration of tetanus prophylaxis remain essential components of prevention.

Treatment of tetanus is primarily aimed at neutralizing circulating toxin, controlling muscle spasms, and providing adequate supportive care. Administration of human tetanus immunoglobulin remains the cornerstone of therapy, as it neutralizes unbound toxin and limits further progression of the disease [2,11].

Table 4. Reported cases of cephalic tetanus in the literature

Author, year	Patient age / sex	Triggering event	Initial symptoms	Progression to generalized tetanus	Outcome
Fabris F, 2023 [19]	54 / M	Facial wound	Trismus, facial nerve palsy	Yes	Recovery
Adeel M, 2012 [20]	12 / F	Otitis media	Trismus, dysphagia	No	Recovery
Adeleye AO, 2012 [21]	young/M	Head trauma	Trismus, neck stiffness	Yes	Pneumonia, recovery
Reda Hamdi, 2023 [17]	43 / M	Idiopathic facial palsy	Cephalic form	Yes	Recovery
Abdirahin Mohamed Abdulkadir, 2026 [10]	17 / M	Head injury	Trismus	Yes	Recovery
Present case (2025)	67 / M	Facial trauma (bicycle accident)	Trismus, dysphagia	Yes	Pneumonia, recovery

Source: compiled by the authors based on [10, 17, 19-21]

An additional aspect of this case that deserves consideration is the initial dose of tetanus immunoglobulin administered at hospital admission. The patient received 500 IU of tetanus immunoglobulin on the third day after the onset of clinical symptoms. Although current international recommendations generally suggest higher doses for treatment of tetanus, several clinical reports indicate that the optimal dose of human tetanus immunoglobulin remains a matter of discussion, and effective neutralization of circulating toxin may occur even with lower doses when administered early in the disease course [11,12].

In the present case, the initial clinical presentation was assessed as moderately severe, and the diagnosis of tetanus was not yet fully established at admission. After rapid clinical deterioration and progression toward generalized tetanus, an additional 2000 IU of tetanus immunoglobulin was administered in the intensive care unit. This stepwise therapeutic approach reflects the evolving clinical picture and highlights the importance of continuous reassessment of patients with suspected tetanus. Similar treatment adjustments during disease progression have also been reported in previous case reports of cephalic tetanus progressing to generalized disease [8,9].

Additional treatment measures include antimicrobial therapy to eradicate *Clostridium tetani*, sedation to control muscle spasms, and intensive supportive care, including respiratory support when necessary. In the present case, administration of tetanus immunoglobulin together with sedation and oxygen therapy contributed to gradual clinical improvement.

Respiratory complications represent one of the most frequent causes of morbidity in severe tetanus. Pneumonia may develop as a result of impaired respiratory mechanics, prolonged immobilization, and difficulties with airway clearance [8,11]. In our patient, pneumonia developed during hospitalization but responded well to antimicrobial therapy and supportive care.

Despite the severity of the disease, the patient demonstrated gradual clinical improvement following comprehensive intensive therapy, including sedation, respiratory support, antimicrobial treatment, and administration of tetanus immunoglobulin. Advances in modern intensive care have significantly improved survival rates among tetanus patients, particularly in specialized centers where early supportive therapy can reduce mortality [2,13,14-17].

Several previously reported cases of cephalic tetanus have demonstrated similar clinical progression characterized by initial cranial nerve involvement followed by generalized muscle rigidity. A comparison with selected cases from the literature is presented in Table 4. In most reports, craniofacial trauma or ear infection represented the primary trigger of infection, and approximately two-thirds of patients progressed to generalized tetanus. The clinical course observed in our patient is consistent with these findings, including the development of respiratory complications during hospitalization.

Finally, this case highlights an important public health issue. Although the global incidence of tetanus has declined considerably due to widespread vaccination programs, sporadic cases continue to occur, particularly among elderly individuals who may not have received booster immunizations for many years [3,15]. Waning immunity in older adults remains a recognized risk factor in many countries, emphasizing the importance of maintaining adequate vaccination coverage throughout adulthood [12,16,18].

Overall, this case illustrates the typical progression of cephalic tetanus to generalized disease and emphasizes the importance of considering tetanus in the differential

diagnosis of trismus and dysphagia following craniofacial trauma. Early diagnosis, prompt administration of tetanus immunoglobulin, and adequate intensive care management remain critical for improving patient outcomes.

CONCLUSIONS

1. In elderly patients, generalized tetanus may present with bulbar and respiratory manifestations (trismus, dysphagia, difficulty breathing) without typical generalized seizures, which complicates early diagnosis.
2. Increased dyspnea in the horizontal position is an important clinical marker of functional upper airway obstruction due to spastic damage to the oropharyngeal muscles and requires immediate airway patency.
3. Early clinical diagnosis of tetanus and timely use of antitoxin, control of muscle spasms, and respiratory support are key factors in a favorable course of the disease, especially in older patients.
4. The absence or insufficient level of immunization in adults and elderly patients remains a significant risk factor for the development of tetanus, which emphasizes the need for revaccination throughout life.
5. Early diagnosis and timely administration of antitoxin are the greatest predictors of survival in patients with tetanus.

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CONFLICT OF INTEREST
The Authors declare no conflict of interest

CORRESPONDING AUTHOR
Anton I. Kohutych
Uzhhorod National University
1 Narodna Sg., 88000 Uzhhorod, Ukraine
e-mail: akohutych@uzhnu.edu.ua

ORCID AND CONTRIBUTIONSHIP
Anton I. Kohutych: 0000-0003-3838-9106 A E F
Andriana A. Halamba: 0000-0003-0175-9943 A D
Vlasta V. Vysochanska: 0000-0003-0998-554 D
Monika T. Maroshan: 0000-0001-5878-3229 B
Oles S. Vakarov: 0000-0002-2044-283X B

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