CASE REPORT

Neonatal tetanus with intestinal atresia, the importance of multidisciplinary management: a case report

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Abstract

Neonatal infection begins through the umbilical cord when the stump is handled with an unsterile instrument. Most cases of neonatal tetanus develop symptoms during the first eight days of life. It is rarely reported with intestinal atresia. We report the case of an eight-day-old baby boy belonging to a Pashtun family, weighing 1.9 kg, admitted with complaints of decreased activity and intolerance to feed, with resultant non-bilious vomiting. Clinical examination revealed a distended soft abdomen, generalised rigidity with opisthotonus, and lockjaw. With the clinical diagnosis of tetanus, management was started using tetanus immunoglobulin and intravenous antibiotics. X-ray of the abdomen was suggestive of jejunal atresia. Surgery was done after one week of medical management for tetanus, and on surgical exploration, proximal jejunal atresia was confirmed. Resection anastomosis was done. The post-operative period was uneventful, and the neonate was discharged on oral feed. In such cases, immediate surgical intervention is not required, and multidisciplinary team management is recommended.

Keywords: Clostridium tetani, Jejunal Atresia, Opisthotonus, Lockjaw, Multidisciplinary team, Maternal and Neonatal Tetanus.

DOI: https://doi.org/10.47391/JPMA.20733

Introduction

A number of potentially fatal illnesses can affect women and their new-born children when births take place in unsanitary conditions.

One of the most frequent and potentially fatal outcomes of birth in unhygienic conditions and improper handling of the umbilical cord is maternal and neonatal tetanus, which is a sign of unequal access to immunisation by mothers, new-borns, and children. Tetanus toxoid injections are given during pregnancy to prevent neonatal tetanus, a major cause of early infant death in many developing countries where access to effective medical care is typically limited. Clostridium tetani is the cause of tetanus, an acute illness that is sometimes fatal. The introduction of tetanus spores into the injured tissue triggers the onset of infection.[1]Tetanus is diagnosed based on clinical features and does not require laboratory confirmation. A confirmed case of neonatal tetanus (NT) is defined by the World Health Organisation (WHO) as a condition that affects a child who, during the first two days of life, can suckle and cry normally. However, between the third-and twenty-eighth day of life, the child loses this ability and either becomes rigid or has spasms.[2] Intestinal atresia associated with neonatal tetanus has rarely been reported. We are unable to find the prevalence of jejunal atresia alone. Global evidence has revealed tetanus as the highest contributor to mortality among children after measles in vaccine-preventable diseases. According to the Pakistan Demographic and Health Survey (2017-18), 69% of women who have given birth in the five years before the survey received sufficient doses of tetanus toxoid to protect their last birth against neonatal tetanus. The percentage varied with level of education and wealth. Women with no education and those belonging to the lowest wealth quintile are substantially less likely to have had their last birth protected from tetanus. For instance, 52% of women with no education had their last birth protected from tetanus compared with 91% of women with a higher level of education.[3] Various interventions have been taken by the government and international bodies to eliminate maternal and neonatal tetanus (MNT).The Maternal and Neonatal Tetanus Elimination (MNTE) initiative by WHO aims to reduce cases to such low levels that the disease is no longer a major public health problem.[4] Unlike polio and smallpox, tetanus cannot be eradicated (tetanus spores are present in the environment worldwide), but through immunisation of children, mothers, and other women of reproductive age (WRA), and promotion of more hygienic deliveries and cord care practices, MNT can be eliminated.[3,5] Multidisciplinary meetings to coordinate and provide continuity of care for medically complex

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Submission complete: 06-05-2024 **First Revision received:**16-08-2024
Acceptance:15-01-2025 **Last Revision received:** 14-01-2025

neonates in the neonatal intensive care unit (NICU) have been associated with improved patient outcomes.[7] After taking informed consent from the father, we share a case of neonatal tetanus with jejunal atresia which was seen in 2020, wherein the child was saved by providing quality post-natal care with integrated multidisciplinary team management.

Case report

An eight-day-old baby boy, weighing 1.9 kg, belonging to a Pashtun family residing in a small town of Nawa Killi in Quetta, was seen in August 2020, with complaints of decreased activity and intolerance to feed, with resultant non-bilious vomiting. The child was admitted in the neonatal intensive care unit at Liaquat National Hospital, Karachi. Relevant history revealed an unremarkable antenatal period however, the father was not sure whether maternal vaccinations were done in the last trimester of pregnancy. The child was born at a local maternity clinic where the family previously had other children. Clinical examination revealed a distended soft abdomen, generalised spastic rigidity with opisthotonus, lockjaw and reduced activity. A clinical diagnosis of tetanus was made by the specialist after excluding meningitis by a negative CSF analysis. X-ray of the abdomen was suggestive of jejunal atresia (Figure1a). Haematological investigations included a complete blood count, with a total leukocyte of 24 x10^6 (Normal range: 9.0- 30 x 10^6)[9]. C-reactive protein was 1 mg/dl (Normal range: 0-0.5 mg/dl).[9] According to Ablett classification (Table 1),[10] Grade III neonatal tetanus was diagnosed and treatment was started with tetanus immunoglobulin at 20 IU/kg given around the umbilicus; intravenous Imipenem and Metronidazole were started as per the departmental antibiotic protocol and the patient was kept on parenteral nutrition. On the 17th day of life, after nine days of medical management and exclusion of any associated congenital anomalies by means of echocardiography, abdominal and head ultrasonography, surgical exploration was done which confirmed jejunal atresia with a varied length of ileum perfused by a single artery (Figure1b). Resection of the dilated atretic segment followed by end-to-side anastomosis was done. The neonate was successfully extubated post-operatively, remained well with uneventful post-operative period, and was discharged on oral feed after a total of 17 days of hospital stay. The first follow-up was done after seven days at which the child was active with intact suckle, tolerating oral feed and passing colic stools. The child was lost to follow-up afterwards.

Table-1: Ablett classification for tetanus severity

Grade	Severity	Signs & Symptoms
1	Mild	Mild trismus, general spasticity, no respiratory compromise, no spasms, no dysphagia
2	Moderate	Moderate trismus, rigidity, short spasms, mild dysphagia, moderate respiratory involvement, ventilatory frequency >30
3	Severe	Severe trismus, generalized rigidity, prolonged spasms, severe dysphagia, apnoeic spells, pulse >120, ventilatory frequency >40
4	Very severe	Grade 3 with severe autonomic instability.

Discussion

Neonatal tetanus usually occurs due to a lack of immunity in the mother and the most common port of entry for the bacteria is the unhealed umbilical cord.[1] Most (90%) cases

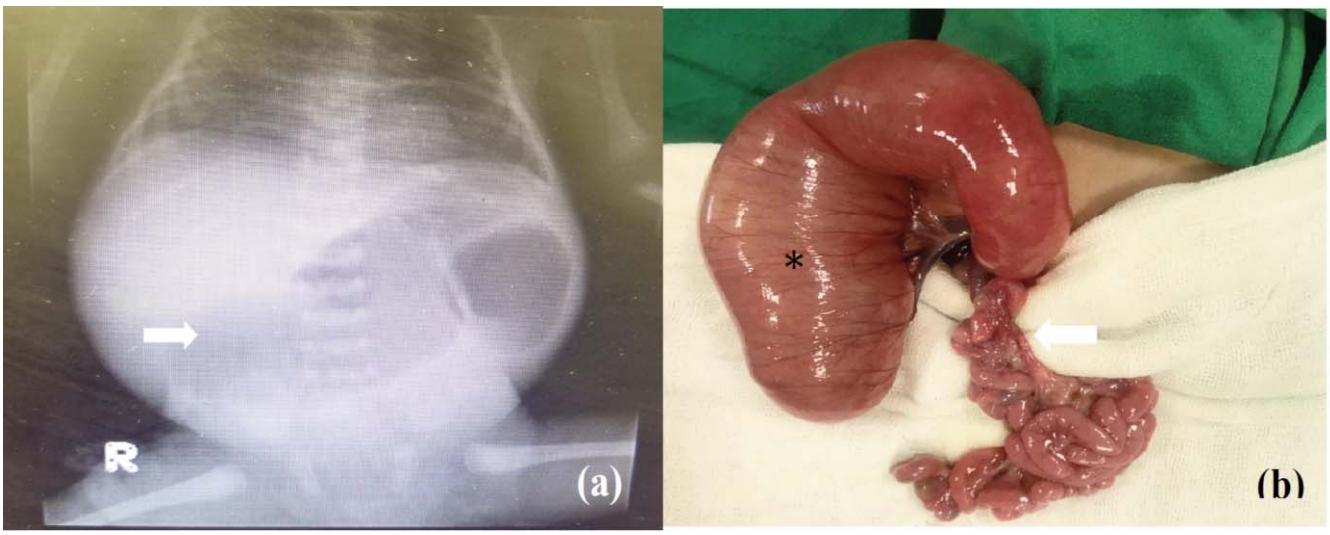

Figure: (a) Plain X-ray of the abdomen showing triple bubble sign (arrow), (b) Dilated duodenum and proximal jejuna loop (asterisk) with apple core type 3b jejunal Atresia (arrow

of NT develop symptoms during the first 3–14 days of life.[1] Generalised stiffness and convulsive spasms of the skeletal muscles are its defining features. The jaw and neck are first affected, and then the stiffness in the muscles gradually spreads. Neonatal tetanus first manifests as an incapacity to suckle; as the condition worsens, widespread rigidity and excruciating muscle spasms occur.[2] An uncommon kind of jejunoileal atresia is called apple-peel atresia, also known as Type-III-b intestinal atresia. The development of mesenteric vascular accidents after the emergence of the middle colic artery is one of its aetiopathogenesis. A search of the available literature did not reveal any case of neonatal tetanus reported with intestinal atresia. Although several surgical methods have been tried, it is still unclear which repair technique is the best. The ideal procedure would enable intestinal extension and primary anastomosis.[6] The successful treatment of these new-borns depends on the involvement of a wide range of disciplines in all aspects of their care. To oversee and uphold a superior level of care, conferences ought to be scheduled to assess the child's development, tackle challenges, and implement necessary modifications to the child's management plan.[7] Hence, a multidisciplinary management is emphasised; in the above case, a neonatologist, infectious disease specialist, and paediatric surgeon helped save the neonate.

Conclusion

Tetanus and intestinal atresia are distinct conditions; however, they can coexist and seldom have been documented. In our patient, tetanus and jejunal Atresia were diagnosed pre-operatively and successfully treated by a multidisciplinary team that included a paediatric surgeon, an infectious disease specialist, and a neonatologist.

Disclaimer: None to declare.

Conflict of Interest: None to declare.

Source of Funding: None to declare.

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Authors Contribution:

TIQ & MA: Substantial contributions to the conception and design of the work, data acquisition, analysis and interpretation, drafting, revising it critically, final approval and agreement to be accountable for all aspects of the work.