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CASE REPORT

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Generalised tetanus: A rare complication of Richter's hernia

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Abstract We present a case report of generalized tetanus following umbilical Richter's hernia in a 10 month old unimmunized boy. This case is reported because tetanus is a rare complication of Richter's hernia and to emphasize the need for immunization of all unimmunized children with tetanus vaccine. A high index of suspicion is important in the diagnosis of Richter's hernia in order to avoid complication, as diagnosis is often delayed or missed. The co-exiting tetany is also a rare co-morbidity of Richter's hernia.

Key words: Tetanus, Richter's hernia, tetany.

Introduction

Tetanus is an exotoxin-mediated disease caused by *Clostridium tetani*, a Gram positive spore forming bacillus found in the soil and gastrointestinal tract of man and other animals. Tetanospasmin, a neurotoxin is responsible for the clinical manifestation of the disease.

Despite the availability of effective vaccine, tetanus is still a major cause of childhood morbidity and mortality in developing countries due to inadequate or lack of immunization.[1-4]

Diagnosis of tetanus is usually clinical, characterized mainly by spasms and rigidity.

The goals of management are eradication of the organisms by wound debridement and antibiotics, neutralizing unbound toxins with anti-tetanus serum (ATS), control of spasms and sedation is achieved with phenobarbitone, diazepam, adequate nutrition and ensuring primary immunization prior to discharging patient.

Richter's hernia is an abdominal hernia in which only part of the circumference of the bowel wall is incarcerated and strangulated.[5] Luminal continuity is preserved and therefore passage of bowel contents through the bowel lumen is not affected. Hence, despite strangulation, there is an absence of intestinal obstruction. Richter's hernia may occur in any hernial site, but is seems most likely to occur in small hernia rings with firm margins and has predilection of femoral site, rarely seen in umbilical site. Diagnosis may be difficult because of insidious pathologic features which allow time for bowel necrosis to develop. Diagnosis may therefore be delayed or missed. As a result, Richter's hernia could be a potential focus of tetanus, especially in unimmunized individuals.

Tetany is a state of hyperexcitabilty of the central and peripheral nervous systems as a result of abnormal concentration of ions in the fluid bathing nerve cells[6]. These abnormalities may be decreases of H^+ (alkalosis), of Ca^{++}, or of Mg^{++}. A decrease of K^+ can prevent tetany despite low Ca^{++} concentration but an increase can precipitate tetany in a patient with low Ca^{++}. Tetany is usually due to hypocalcaemia.

In hypocalcaemic tetany, low calcium levels in the bloodstream increase the permeability of neuronal membranes to sodium ions, causing progressive depolarization, thus increasing the action potentials that result in contraction of peripheral skeletal muscles. Hypocalcaemic tetany may also be associated with vitamin D deficiency. Other causes of tetany include; hyperphosphataemia as in high intake of cow milk, hypoparathy-

roidism and hyperventilation. Diagnosis of tetany is usually clinical, characterized by seizures, carpopedal spasm, laryngeal spasm and overactive neurological reflexes.

In latent tetany, ischaemia, mechanical or electrical stimulation of the motor nerves induce Trousseau sign, Chvostek sign, peroneal sign or Erb sign and the removal of precipitating factors and calcium supplementation usually alleviates the condition. Serum estimation of calcium, phosphate, magnesium, and albumin also aids the diagnosis of tetany.

Case report

ADI is a ten month old boy admitted to the Emergency Paediatric Unit (EPU) of University of Maiduguri Teaching Hospital (UMTH) with two weeks history of progressive umbilical swelling and one week history of inability to open the mouth and generalized spasms. There was no history of vomiting, fever, convulsions or hoarseness of voice. He never had otitis media or recent penetrating injury. He had not received any childhood immunization due to negligence and is from low socioeconomic parents.

At presentation, he was pale, anicteric, not dehydrated, and conscious but agitated with trismus, and provocative spasms. He also had carpopedal spasms. He was underweight (6.7 kg), but without pedal oedema. No stigmata of liver disease and no clinical signs of rickets were seen.
Abdominal examination revealed a rigid abdomen with hyperaemic non-reducible umbilical hernia. A diagnosis of generalized tetanus with tetany and suspected umbilical Richter's hernia was made.

Laboratory evaluation showed that his haematological profile was essentially normal. The blood biochemistry revealed hypocalcaemia of 1.9 mmol/l with mild acidosis. Serum phosphate, potassium and alkaline phosphate were within normal limits. Total serum proteins and albumin levels were low; 51g/dl and 31g/dl respectively. Microbiological examination of the wound swab from the umbilico-enterocutaneous-fistula yielded Gram positive bacillus, but culture yielded no growth.

He was commenced on drug combination therapy of intravenous diazepam, intramuscular phenobarbitone for control of spasms and to achieve sedation.
Oral feeds were withheld initially and intravenous dextrose saline was administered.

On the 5th day of admission, nasogastric tube feeding with high protein pap was commenced to maintain positive nitrogen balance and calorie. He also had cautious intravenous calcium gluconate with prompt improvement of the carpopedal spasms and was subsequently placed on oral calcium supplements.

Other treatments included intravenous ceftriaxone, metronidazole, intramuscular gentamicin and ATS. Immunotherapy with human immunoglobulin was not given because of non-availability.
On the second day of admission, he developed an umbilico-enterocutaneous-fistula discharging faecal materials and had simple closure of the fistula and repair of the Richter's hernia. He was transfused with blood intraoperatively.

Clinical improvement was steadily sustained with resolution of tetany, less trismus, and good control of spasms.

He was discharged home after three weeks of hospital stay on oral diazepam after enrolling him to primary immunization schedule with tetanus vaccine. The parents were counseled.

Discussion

Tetanus is a known and common complication of penetrating injuries,[1-2] and chronic suppurative media[3-4] especially in unimmunized children. Tetanus complicating unusual portal of entry such as bitten tongue[7] or rectal prolapse[8] have also been reported. No portal of entry was identified in our patient after careful examination, except of the Richter's hernia.

The underlying cause of hypocalcaemic tetany in this patient is difficult to establish, however, it could be attributed to a latent tetany precipitated by the strangulated and ischaemic Richter's umbilical hernia. The patient is also malnourished and therefore, is predisposed to micronutrient deficiency including calcium.

Although, the diagnosis of Richter's hernia was considered on admission, the complication of enterocutaneous fistula could be due to the delay in hospital presentation. Richter's hernia with anoxic and necrotic tissues was the likely site of inoculation of the spores in our patient, which is likely to be from his own gastrointestinal tract.

A high index of suspicion is important in the diagnosis of Richter's hernia in order to avoid complications.

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References

1. RT Akuhwa, MA Alhaji, MA Bello, SG Bulus. Post-neonatal tetanus in Nguru, Yobe State, North-eastern Nigeria. *Niger Med Pract 2010; 51 (3): 40-42.*
2. AI Lagunju, FO Akinbami, BO Ogunbosi. Childhood tetanus in the post-neonatal age group in Ibadan, Nigeria: Any way nearer eradication? *Arch Ibad Med 2008; 9(1&2):39-41.*
3. MA Alhaji, MG Mustapha, GM Ashir, RT Akuhwa, MA Bello, AG Farouk. Recurrent generalised tetanus: case report. *Trop Doct 2011; 41: 127-128.*
4. Tischer GW, Sunakron P, Duangman C. Otogenous tetanus (sequelae of chronic ear infection). *Am J Dis Child 1977: 131: 445 – 6.*
5. Tito WA, Allen WC. Richter and Litre hernia. In: Nyhus JB, Condon RE (editors). Hernia, 3rd edition. Philadelphia: Lippincott; 1989: 305-310.
6. Harrison HE. Tetany. In: Behrman RE, Vaughan VC, Nelson WE (editors). Nelson Textbook of Pediatrics, 13th edition. Philadelphia: Saunders, 1987:207-210.
7. MA Alhaji, MG Mustapha, MF Bashir, S Pius. Tetanus following tongue bite from repeated convulsions: a case report. *Trop Doct 2012; DO1: 10.1258/ td.2012.120089. "In press".*
8. AR Porter. Tetanus: A rare complication of rectal prolapse. *Niger Med J 1982; 12(3):2912.*