

Case Report

Surgery in refractory metabolic derangements: Report of a case

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Introduction:

The problems associated with emergency surgery in infants are multifaceted, especially in the presence of inanition and fluid/electrolyte disturbances. These include the high energy requirements of the infant, the delicate physiology of their total blood volume, and the synergism between inanition and sepsis. This could easily result in a vicious cycle if management is delayed. Therefore careful attention must be paid to patients energy and fluid/electrolyte status, and derangements promptly corrected^{2,3}.

The underlying pathology which in this case was ileocolic intussusception should be treated without delay. Cuschieri has described intussusception as the mechanism of a catastrophic vascular accident⁴. It is more than a mere telescoping of a segment of intestine into the adjacent segment⁴. The vascular supply of the inner layers of the intussusception is most liable to be impaired⁵ resulting in gangrenous bowel, with its ominous consequences of dehydration, electrolyte disturbances, hypoglycaemia (sirs) and even death if prompt surgical intervention is not initiated.

Case Report:

A 6 month-old boy presented with a 2-month history of fever, generalized tonic, clonic convulsion, abdominal distension, vomiting and passage of mucoid bloody stools. The child was admitted in a peripheral hospital and treated for chronic infantile diarrhoea without much improvement. On presentation in our hospital, the baby was unconscious, pale and jaundiced with a temperature of 39⁰c in and weighed 4.6kg. The respiratory rate was 38 cycles per minute, but the lung fields were clear. The pulse rate was 160/min, regular of good volume.

The abdomen was distended and tense. No masses were palpated. Rectal examination revealed perianal soilage with mucoid faecal matter, good sphincteric tone and an empty rectum. The child was unconscious but rousable. A clinical impression of delayed intussusceptions was entertained with electrolyte disturbance. Active resuscitation and some investigations were commenced. Plain X-Ray of the abdomen showed multiple fluid – air levels but the was too sick for more invasive investigations. Laboratory results on admission showed Hypokalemia 2.6mmol(3.5-5.5mmol), Hyponatremia 110mmol(134-145), hypocalcemia 1.7mmol/L(3.9-5.6mmol/L). There was also hypoproteinemia and low serum urea. The liver function test was normal. There was severe anemia with a Packed cell volume (PCV) of 20%. The WBC was 10,000/mm³ with toxic

granulations. The Genotype was AA and Retroviral screening was negative. Resuscitative effort continued but reassessment after 20 hours showed that the biochemical status was deteriorating rather than improving, with worsening hypokalemia, hypoglycemia and anemia. The risk of continued unrewarding resuscitation was weighed against the benefit of quick risky surgical intervention. Laparotomy was done with face mask anesthesia. 700 milliliters of seropurulent peritoneal fluid, inter – loop abscesses, fibrous adhesions and an ileo-colic intussusception were encountered with no gangrene. This was obviously difficult to reduce due to oedema and adhesions and was complicated by the inadvertent laceration of the intussusciptien 35cm from the ileum. This warranted resection of 35cm of the ileum with primary ileo – ileal anastomosis. The peritoneum was copiously irrigated with warm saline and the abdomen was closed over a corrugated drain. The patient was then admitted into and nursed in the Intensive Care Unit (ICU) with assisted respiration. He was commenced on broad spectrum antibiotics (Ceftazidime, Metronidazole) and a renewed effort made to correct the metabolic imbalances. On the 7th post operative day, the child was more conscious and the metabolic events were improving rapidly. He was weaned off the ventilator, and feeding with enriched feed supplements was commenced by Nasogastric

Tube. However soon after this the child developed a burst abdomen but there was no evidence of disruption of the anastomosis. The child easily tolerated peritoneal lavage under face mask with no serious consequence. After exploration the wound was left open to granulate but leakage of faecal matter into the wound meant there was an enterocutaneous fistula but this was managed conservatively with satisfaction. The wound was infected with *Proteus vulgaris*, *E coli* and *Pseudomonas* and was treated

Discussion

Surgical intervention on the infant implies indept concern on the child's physiology. Commonly encountered problems in the child with intussusception include electrolyte derangements, inanition, and bacterial infection.

Intussusception is a special variety of strangulating mechanical intestinal obstruction with direct compromise to the vascular supply. 8% of cases are seen in children less than 2 years of age and the peak incidence is between 4 and 9 months^{4,5}. In our center, however infant intussusception accounted for 56% of cases with a male to female ratio of 3.6:1. in one report³

This patient presented to a peripheral hospital at age 4 months where he was misdiagnosed for chronic gastroenteritis, though it is, associated with intussusception in 30% of cases⁴.

On presentation to our centre 2 months after intussusception the child was moribund and was not fit for surgery with an ASA (American Society of Anaesthesiologists grading) 5E⁷. Seventy seven percent of (77%) patient with intussusception may present with a threat to life⁷. The onset of gangrene in intussusception may be as early as 24 – 36 hours⁵ marked by early abdominal distension, copious vomiting and absolute intestinal obstruction. Death from this or from peritonitis secondary to gangrene is a real threat. In delayed treatment there may be mucosal sloughing of the intussusceptum and these can bring about some respite.⁴ This might have been the case in our patient who lingered on for 2 months. The compromised mucosa is a very useful portal for bacterial translocation into the blood stream causing life threatening septicaemia and even death.

The wound swab in the patient yielded mixed bacterial growth but blood culture was not done.

The liver function test in this patient was normal, thus confirming that the jaundice was a haemolytic process from sepsis. Usually hypokalemia is not a frequent feature of strangulation but copious vomiting can be the cause in our patient.

While the risk of surgical intervention after limited resuscitation may be great; the risk of further waiting may be even greater, since the presence of the primary pathology keeps flaring an on-going vicious cycle.

according to sensitivity results. The metabolic imbalances normalized, the patient became conscious and alert with a GCS of 15. He was then transferred to the paediatric surgical ward where the wound became clean with dressing. The fistula closed with conservative management delayed primary closure of wound was effected.

He did well and was discharged home on the 41st day post admission. He has remained well at 2 years follow up (fig 2)

This makes complete correction of the derangement even more difficult and nearly impracticable.

Though this is a report of a case we suggest that if one encounters refractory metabolic derangements from gangrene in an infant the risk of intervention with meticulous care to avoid the burden of anesthesia a risky intervention may be rewarding. Added care in the intensive care will multiply the chances of getting a life patient like our case. This child is alive with no deficits at 2 years after.

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