Concurrent Scrub Typhus and Dengue Fever Mimicking Acute Appendicitis

Both scrub typhus and dengue are known to independently cause acute abdominal pain, but it is seldom severe enough to mimic localized peritonitis necessitating surgery [1,4]. We report a child with both these conditions, who underwent a surgery due to suspected acute appendicitis.

A 9-year-old girl presented with abdominal pain, anorexia, high-grade intermittent fever and non-bilious vomiting of two days. History of recent travels or contact with coronavirus disease (COVID-19) was absent. She appeared sick, and her temperature was 38°C, pulse rate was 110/min and respiratory rate was 30/min. Local tenderness with guarding (McBurney sign) was elicited in the right iliac fossa. She did not have peripheral lymphadenopathy or organomegaly.

Her hemoglobin was 9.7 g/dL, leukocyte count was 15.8×10^9/L (with 81% neutrophils), and urine had traces of albumin and 12-15 red blood cells per high power field. Serum levels of electrolytes, urea, creatinine, bilirubin and liver enzymes were within normal limits. Ultrasonography revealed probe tenderness and a non-compressible aperistaltic tubular structure in the right iliac fossa, suggestive of acute appendicitis. Calculated ‘pediatric appendicitis score’ was 9 out of 10. She was scheduled for emergency appendicectomy.

During surgical preparation, a small black eschar of 1 x 0.5 cm was noted in the right hip and it raised the suspicion of scrub typhus. On surgical exploration, the appendix and peritoneal cavity were found to be normal. There were no subserosal petechiae. Non-specific mesenteric lymphadenopathy was noted. The operation was concluded without performing appendicectomy. After 8 hours of surgery, she was started on oral doxycycline (4 mg/kg/day).

Enzyme linked immunosorbant assay (ELISA) done on the first post-operative day was positive for IgM antibodies against scrub typhus. Dengue IgM antibody titers and NS1 antigen titers were positive, while dengue IgG titer was negative. Reverse transcriptase polymerase chain reaction (RT-PCR) of nasal swab for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was negative, but COVID-19 antibody was equivocally positive. Peripheral smear was negative for malarial parasites. Urine and blood cultures were sterile.

Thirty six hours after surgery, she developed respiratory distress, hypotension (BP 80/50 mmHg) and drop in oxygen saturation (SpO2 85%). Blood gas analysis revealed respiratory alkalosis. Platelet count, which was 155×10^9/L on admission, dropped to 58×10^9/L. Activated partial thromboplastin time was 28 sec and prothrombin time was 19 sec (International normalized ratio 1.4). Serum D-dimer was 2585 ng/mL. ECG recorded sinus tachycardia. Echocardiography revealed dilatation of all four cardiac chambers with left ventricular ejection fraction of 44%. Chest radiograph showed diffuse haziness with mild pleural effusion. Systemic inflammatory response to infectious fever was diagnosed. She was treated with ionotropes (noradrenalin), frusemide and oxygen by nasal prongs. Broad spectrum antibiotics (piperazillin and tazobactum) were also empirically started, and continued until the negative blood culture reports. Defervescence occurred 42 hours after surgery, and doxycycline was continued for 7 days. On the fourth postoperative day, her hemodynamic status and coagulation profile became normal. On the eighth day, she was discharged and is presently healthy at one year of follow-up.

Abdominal pain without physical signs of peritonitis is a common presenting symptom in children with scrub typhus (32%) and dengue fever (77%) [1,4]. However, pain severe enough to mimic acute surgical abdomen is rare in both. A Sri Lankan study [4] reported that only 17 out of 3309 patients (0.5%) suffering from dengue fever presented with features of peritonitis. A review of English literature could identify only six patients (all adults) with scrub typhus presenting as acute abdomen [5]. As compared to adults, abdominal pain is generally infrequent in children with scrub typhus [1].

The association of acute abdominal pain and infectious fevers is well known. This combination can be classified into three distinct etiopathological types namely coincidental (type 1), causal (type 2) and mimicry (type 3). During febrile episodes, several patients experience acute exacerbation of pre-existing calculus cholecystitis (type 1b) or chronic pancreatitis (type 1c). Coincidental true appendicitis (type 1a) during dengue fever has also been reported [6]. Infectious fevers are known to cause widespread serositis and systemic inflammation. By this mechanism, they may precipitate peri-appendicitis (type 2a), peri-cholecystitis (type 2b) and acute pancreatitis (type 2c). In contrast to transmural appendicitis, only the seromuscular layer is inflamed in peri-appendicitis [4,7]. Spontaneous rupture of enlarged spleen and bowel perforation due to vasculitis may also cause general peritonitis (type 2d) in infectious fevers [8,9].

The most perplexing clinical presentation is that of the mimickers (type 3). Exact mechanism is not known as to how acute signs and symptoms are caused in the absence of actual inflammation. Several hypotheses have been proposed to explain this phenomenon [4,7,10]: Cytokines released during febrile episodes may cause mucosal edema (interstitial plasma leakage) or smooth muscle spasm of tubular structures such as the cystic duct, pancreatic duct or appendix. The resultant luminal obstruction may lead to the sequence of pent-up secretion, over-distension, superadded bacterial infection, serosal stretching and acute pain [7]. Sonographic visualization of the distended appendix in our patient may support this hypothesis. Other proposed mechanisms include subserosal bleeding (petechiae) due to thrombocytopenia or leukocytoclastic vasculitis, ischemic...
Recurrent Generalized Scleredema in an Adolescent Girl With Uncontrolled Type 1 Diabetes Mellitus

Scleredema is a non-pitting induration of the skin and connective tissue, usually secondary to intrinsic disease or infection, rare in children, and generally reversible on treating the primary disease [1]. The main associations of scleredema in children are infections [2-4]. Scleredema as a manifestation of uncontrolled diabetes in children and adolescents is rarely reported in India [5]. We report recurrent generalized scleredema in an adolescent girl having poorly controlled type 1 diabetes mellitus (T1DM).

A 13-year-old girl presented with generalized swelling over the whole body for six months. The swelling started from the arm followed by the abdomen and gradually involved the face, chest and legs. She also complained of pain in the abdomen, arms and legs for one month. There was stiffness of facial muscles and difficulty in opening the mouth and difficulty swallowing food for 15 days. There was no history of cold, cough, fever with rash, morning stiffness in joints, no history of Raynaud phenomenon, or eating raw or undercooked pork. She was diagnosed as T1DM at 9 years of age but was poorly compliant to the prescribed insulin injections. Her documents showed persistent hyperglycemia and frequent hospitalization for diabetic ketoacidosis. She weighed 35 kg, and on examination was alert, afebrile, with heart rate of 90/min, respiratory rate 20/min, blood pressure 108/68 mm Hg, and diffuse swelling was seen over the face, thorax, abdomen, bilateral upper and lower limbs. Swelling was diffuse, tense, waxy, hard, non-tender, indurated, non-pitting and could not be pinched. Her face was blank, mask-like, with abolition of skin linings and folds. The rest of the general and systemic examinations were normal.

We consider SARS-CoV-2 antibodies noted in our patient to be due to the well documented phenomenon of serological cross-reactivity with dengue [11]. Despite performing laparotomy, we avoided excision of non-inflamed appendix as it may increase the risk of wound infection and add to the morbidity without any additional benefits. This case highlights the need to consider co-infections and rare complications in children with uncommon presentations.

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