

Multiple Foreign Bodies in a 5-Year Old: Non-Accidental Trauma

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Summary

Foreign bodies, a significant proportion of which are a result of non-accidental trauma, are common but under-reported. Pediatric foreign body injuries can be inconsequential, severe or even fatal, and cause long-lasting morbidity and the need for treatment and hospitalization. Evaluation of injury or death requires elements of detection, pattern recognition, interpretation and comparison, all based on clinical, radiological and forensic experience with normal and abnormal findings. We report an unusual and strange case of non-accidental trauma in a young child who presented to our surgical services with 44 sewing needles and wires in his body. The patient had specific characteristics or risks for abuse. His injuries were evaluated, recognized, documented and reported. He was treated for peritonitis and malnutrition

and the foreign bodies removed using staged operations under image guidance. Patient's recovery was uneventful.

Keywords: Multiple foreign bodies, Trauma

Ann Afr Surg. 2020;17(3):137–141

DOI: <http://dx.doi.org/10.4314/aas.v17i3.12>

Conflicts of Interest: None

Funding: None

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Submitted: 7 July 2019

Revised: 27 December 2019

Accepted: 13 February 2020

Online first: 29 May 2020

Introduction

The definition of child abuse has long been argued. Finkelhor was one of many authors to suggest a definition (1). The dimensions for an act to be 'maltreatment' include: intentional act, socially censored in locale in which it occurred, abusive according to international consensus, harm to a child rather than an adult (2). According to the Zambian Affiliation and Maintenance of Children Act of 1995, a child is a person below the age of 18 years (3). Though definitions of child abuse are many, our laws define it as any non-accidental behavior by parents, caregivers, other adults and adolescents that is outside the norms of conduct and entails a substantial risk of causing physical or emotional harm to a child. Some forms of negligence or omissions are not an exception (3). In defense, abusers cite the need to discipline a child as reason for the injury. However, there is a difference between discipline and abuse. Discipline teaches children right from wrong and does not make them live in fear. The opposite is true about child abuse (4).

There are four main types of abuse: physical, neglect, sexual, and emotional. Physical abuse inflicts physical injury as a result of punching, beating, kicking, biting, burning, to mention a few. The surgeon is mostly involved with physical abuse but should be aware of the

other forms. Perpetrators are parents, relatives, care givers or partners of parents in most cases (5).

Abuse is often inflicted on children with specific characteristics and particular relationships with the perpetrators. Risk factors for abuse include single parent homes, unemployed parents, parents who were previously abused, prematurity, disability, step children, unplanned children, and first-born children. Not all risk factors are present in any case. However, they provide an overview (2,6). There is strong evidence that poverty and economic disadvantage are associated with child maltreatment. Children from these backgrounds were almost twice as likely to be involved in substantiated maltreatment investigations (7). Huang examined the relationship between non-accidental trauma and the economy and found a doubling in the rates of non-accidental trauma during the economic recession (8).

Non-accidental trauma in children is common. Foreign bodies are common in children, despite interventions to prevent them (9). Foreign bodies comprise 7% of all visits to paediatric trauma units (10). Among these, a significant proportion is attributed to non-accidental trauma.

Many African countries pay insufficient attention to abuse (11). Historically, child protection and child abuse prevention services are fragmented and generally lack

unified centers or systems, or both, to deal with child abuse appropriately (2).

Efforts are increasing to harmonize national laws and policies, in line with relevant international and regional human rights instruments pertaining to children. But despite this progress, international commitments to protect children from violence are often not translated into action (12). The development of a National Child Protection System is still in the early stages in Zambia (12).

Foreign body injuries in children remain an important cause of morbidity, hospital stay and interventions. Pediatric foreign body injuries can be inconsequential, severe or even fatal, and cause long-lasting morbidity (9). We report a case of multiple needles and wires in a 5-year-old boy. Despite non-accidental trauma of such magnitude being unusual in the eyes of many, we write this report to raise awareness that it does occur in our environments. We also draw the attention of clinicians dealing with child trauma to maintain a high index of suspicion to non-accidental trauma.

Case report

A 5-year-old boy was taken to a local hospital by his biological mother for abdominal pains in the last 18 months, vomiting for 1-week, scrotal swellings for 2 weeks, and inability to walk for 2 weeks. He also complained of cough associated with change of position and had history of intermittent fever.

His past medical, surgical and drug history were non-significant. He was fully immunized for age and attained developmental milestones on time.

He was a first-born son of a teenage mother, born at term, with birth weight of 3 kg. His parents divorced and both re-married. The boy moved between the homes of his parents and their new spouses. He also stayed with his paternal and maternal grandparents among other relatives for varied periods of time.

On examination the boy was irritable and emaciated (Fig. 1). The abdomen was soft, non-tender, but had palpable masses, and a peri-umbilical abscess, which was incised and drained. During this procedure, a wire measuring 15 cm long was found traversing the abscess cavity and entering the abdomen. He subsequently developed peritonitis. Radiographs revealed metallic foreign bodies, consistent with sewing needles and wires of various sizes in the neck, chest, abdomen and perineum.

Exploratory laparotomy revealed peritoneal contamination with feculent materials, inter-loop abscesses, 13 wires and 12 sewing needles piercing the stomach and small intestines. The needles and wires ranged from 3 cm to 17 cm long, and of variable thickness. Twenty-five needles

and wires were removed from the abdomen, and bowel repair and peritoneal lavage were performed. Patient nutrition was optimized and he fully recovered.

Patient was transferred to a tertiary hospital for removal of remaining needles in the chest, abdomen and perineum (Figs. 2 and 3). A multidisciplinary team was constituted consisting of pediatric surgeons, pediatricians, nurses, anesthetists, radiologists, medical laboratory scientists, physio-therapists, nutritionists, social welfare, and counselors.

The patient was then optimized in readiness for the next operative procedures. The remaining foreign bodies were removed with the aid of an image intensifier in a catheterization laboratory. Surgery was staged and at the first procedure, 9 needles were removed. Two needles were removed in the neck via midline neck incision. One was lying anterior to the trachea and the other obliquely in left lateral neck. Modified trap-door incision revealed 1 needle anterior to left brachiocephalic vein and another lying between thymus and pericardium. Via right thoracotomy incision, 1 needle was removed from lung tissue, and 1 needle was found lying within superficial tissue of the lateral chest wall. Three more needles were removed from liver parenchyma via right transverse abdominal incision.

The patient was nursed in ICU. He made full recovery and was discharged 3 weeks after his last operation (Fig. 4). He was placed in a social welfare home to allow Child Care and Protection Services to investigate the safety of his home environment. In total, between the first local hospital admission to his placement in the home, he stayed in hospital for 3 months. To date counselors and social welfare services have continued providing their respective services to this child and his family.

Discussion

Non-accidental trauma presents itself with treatment challenges. Similar to other non-accidental injuries, this patient's case presented to our medical services with many ethical, medical and legal dilemmas. It was not clear who the perpetrator was because there no confession or a conviction. However, to determine whether this was accidental trauma or not, the expert panel approach was used to determine the nature of the injury. The standardized questions answered were adopted from Lorenz (13). Targeting specific type of injury approach further helped to arrive at a conclusion. This patient had 44 needles pierced into his body. Though not established, these insertions were believed to have occurred at different times. The intention was not clear.

documented in literature. Patient was first-born male child of economically disadvantaged parents; his parents divorced and each found a new partner. He was a step-child in two homes and he stayed in different homes under various caregivers.

Once surgery was done and patient recovered, though he needed to be placed under social and protective services. It remains unclear what effect this separation from his mother will have on him. The need to have medical psychologists involved in cases like this right from the start cannot be overemphasized. This patient has siblings left in the environment he was separated from. The question still remains what to do about them, as they are at risk too.

This case exposes the weaknesses prevailing in our child protection services. The patient stayed for a while in our medical wards before he was placed in a social welfare home. We should have entered his case in a trauma register or, more specifically, in a non-accidental trauma register for children, but it is not available. Should we then escalate the smart care system and incorporate this case? Why did it take social welfare so long to move this patient away from the hospital environment?

The surgeon's prompt surgical evaluation is necessary to determine the scope of injury. Admission to the trauma service and a thorough tertiary survey should be considered for all patients (14). Indeed, a high index of suspicion must be maintained in order to diagnose non-accidental trauma, such as a physical exam finding of multiple injuries in various stages of healing.

In other words, depending on the circumstances, any screening clinician should thoroughly evaluate children, looking out for clues or red flags in the history such as delay in presentation, reluctance to explain, inconsistencies between the injury and the story given, inconsistencies in the narratives between child and caregiver. All children with suspected abuse must be given a complete general and orthopaedic examination. To achieve this, these children must be fully exposed, checked for cutaneous manifestation of chronic and acute trauma, and palpated for orthopaedic injuries. The genitalia and anus must be inspected too.

Common findings include fork marks, cigarette burns, immersion burns, fractures in different stages of healing, sternal fractures, femur fracture in an infant, humeral shaft fracture in a child less than 3 years, bucket handle fractures, posterior rib fractures, digit fractures in non-ambulatory infants and children (15). Suspected abuse should be thoroughly investigated with the help of child protection. For example, in the Netherlands, professionals who suspect abuse are required by law to follow a



Figure 1. Child at presentation at local hospital



Figure 2. X-rays: A (AP view) and B (lateral view) showing needles in the neck, mediastinum, lungs and liver.



Figure 3. X-rays: A (AP view) and B (lateral view) showing needles in abdomen, pelvis and perineum.



Figure 4. Child after full recovery from surgery, free of foreign bodies

The act became known to us only because he became sick and was in need of surgical care. Though the risk factors in our environment have not been fully studied, this patient presented with a number of risks factors

reporting code for domestic violence and child abuse (16). Evaluation of injury or death requires elements of detection, pattern recognition, interpretation and comparison, all based on radiologic experience with normal and abnormal findings (17).

Differential diagnosis of non-accidental trauma includes accidental trauma, osteogenesis imperfecta, metabolic bone disease, birth trauma, vertically transmitted infections, physiologic periostitis, etc. Patient in this case had non-significant past medical and surgical history. In addition, the specific injuries inflicted on this child beg not for a differential diagnosis.

The importance of the pediatric surgeon in the assessment or management cannot be downplayed, as seen in a paper written by Mauricio (18) that speaks of the position statement of trauma committee, Board of Governors and members of American Pediatric Surgical Association. They state that the pediatric surgeon is in a unique position to assess, stabilize and manage a victim of child physical abuse (18). This patient was managed using a multi-disciplinary approach. The multidisciplinary team was led by the head pediatric surgeon. This team assessed, optimized the patient for surgery, and surgical approaches were planned with input from all the members of the team. Patient was operated on in a staged approach.

Throughout his hospital stay, the patient received nutritional support. The patient, his mother and grandmother received psychosocial counselling and support. The pediatricians provided rehabilitation for the patient's neural development.

Once treated for all injuries, patient must be isolated from the harmful home and linked to social, child care and protection services, as mandated by the law. This patient was placed in a social welfare home. He was isolated from the suspected environment of abuse. He has continued to do well, physically and socially.

It is important to have clear and precise documentation as often the clinician is the only one capable of denouncing the crime to the legal authorities (19). The medical records are well documented and elaborate. However, there has been no trauma registry into which this patient and others with similar circumstances should be entered, for record keeping, and also to raise red flags to alert unsuspecting health workers who possibly will attend to this child and other children in future.

Conclusion

Non-accidental trauma is not a rare occurrence in children. A clinician must maintain a high index of

suspicion, have detailed documentation, treat and isolate the child from suspected abusers, and report the matter to child protection services, which should have a focal person stationed in any hospital.

Acknowledgements

Dr Makupe Alex, Consultant General Surgeon, Head Clinical Care, Ministry of Health; Dr Kasoma Donald, General Surgeon, Chipata Central Hospital; Dr Mbinga, Physician, Chipata Central Hospital; Dr Sunkutu Veronica, Consultant Radiologist; and Dr Chanda Christopher, Consultant Pediatric Anesthetist.

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