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Isolated Blunt Abdominal Trauma in Children who are Haemodynamically Stable – Advice to Support the Associated RCEM Safety Flash

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RCEM is aware of the variation in national practice with regards the management pathways for haemodynamically stable children who have sustained blunt abdominal trauma e.g. handlebar or seat belt injuries.

RCEM recognises that this is an area of clinical practice that is also of concern to emergency clinicians. This advice is aimed at addressing some of these concerns by providing a framework for decision making. The recommendations represent a consensus view given the variability of presentation and the lack of specific evidence to help guide management.

These recommendations refer to children who are haemodynamically stable and have isolated blunt abdominal trauma. The clinical pathways for those children who are clinically or haemodynamically unstable are well established. Children who have sustained blunt abdominal trauma in-addition to other injuries, i.e., non-isolated, are not part of these recommendations. However, it is recognised that this group of patients is at an increased risk of intra-abdominal injury when associated with other injuries for example, head injury with GCS<14, lung injury (haemothorax, pneumothorax, hypoxia, pulmonary contusion), frank haematuria, and distracting injuries.

Children may present with blunt abdominal trauma as a consequence of multiple different mechanisms, but common injuries include a fall from a bicycle e.g. handlebar injury, and seat belt injuries following a motor vehicle crash. For those children who are not clinically or haemodynamically unstable, decisions regarding whether to perform a CT scan, when to observe and when to discharge home are much more difficult; especially given the need to minimise a child's exposure to ionising radiation. Clinical assessment of a frightened child requires patience, skill, and experience. Further complexity arises with the knowledge that the initial contrast CT scan may not be 100% sensitive for all blunt trauma injuries e.g., bowel injuries.

Clinical predictors for significant intra-abdominal injury in the haemodynamically stable child include abdominal pain, vomiting, abdominal wall bruising or marks (handlebar, seat belt etc.), abdominal tenderness, abdominal distension peritonism or absent bowel sounds. Alcohol intoxication has also been associated with positive intra-abdominal findings on a CT scan following blunt intra-abdominal trauma.

Recommendations

- All children who have sustained a blunt abdominal trauma such as a handlebar injury should be assessed in an emergency department, even if this involves transferring from a minor injury unit.

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- Children who have sustained blunt abdominal trauma should be assessed by an emergency clinician who has had experience in managing this patient group. Priority should be given to early clinical assessment, analgesia, and vital sign monitoring (using an age-appropriate Paediatric Early Warning Score).

- In the absence of a suspected spinal cord injury, routine digital rectal examination is unlikely to be helpful.

- Blood tests should be performed (lactate, liver enzymes, amylase, FBC, U&Es) and urinalysis. Abnormalities of blood tests, particularly lactate, transaminases, or amylase should prompt re-consideration of the need for a CT scan.

- Children who have clinical symptoms and signs, or where there is ongoing clinical concern, should be considered for an IV contrast CT scan.

- There is no role for plain abdominal radiography or point of care ultrasound in the management of a haemodynamically stable child with blunt abdominal trauma.

- If no intra-abdominal injuries are demonstrated on the CT, the emergency clinician should be aware of the continued possibility of an intra-abdominal injury, and depending on the clinical assessment of the child, a further period of in-patient observation (12-48 hrs.) and serial examination may be warranted. Patients that are potential candidates for discharge home following a 'negative' CT scan should fulfill the following criteria; no abdominal pain, no abdominal wall markings (e.g. handlebar), remained stable, no abnormal blood tests, appropriate social circumstances (e.g. no concerns about abuse or ability to return in case of deterioration) and no clinician or parental concern.

Indications for a CT Scan in the Haemodynamically Stable Child following Blunt Abdominal Trauma

• Abdominal pain or tenderness or peritonism not caused by minor superficial injury
• Abdominal wall bruising
• Positive FAST scan
• New abnormal transaminases or elevated amylase
• Declining or abnormally low haematocrit or haemoglobin
• Frank haematuria
• Inability to perform adequate or serial abdominal examinations
• Risk for significant for intra-abdominal injury:
  And distracting injuries
  Or intoxication
  Or Associated pneumothorax or haemothorax
  Or pulmonary contusions with decreased breath sounds or hypoxia

- The finding of abdominal distension on examination should prompt early consideration of insertion of a naso-gastric tube.

- Children without any clinical symptoms or signs and whose pain has settled with simple analgesia, may be considered for observation. This should consist of vital sign monitoring and repeated re-examination.

- The period of observation required depends on multiple factors including: the degree of clinical suspicion; examination findings; investigation results; social circumstances; and the level of parental concern.

- If the assessing emergency clinician has ongoing clinical concerns about a stable child who has been under observation in the emergency department for four hours, but who also feels the threshold for CT scan has not yet been reached then the patient should be referred to the appropriate in-patient team (e.g. surgeons or paediatricians depending on local pathways). 'Four hours' should not arbitrarily be used as a 'cut-off' for decision making regarding whether to proceed to CT scan or not. The child may require a further 12-48 hours of in-patient observation.

- Those patients with intra-abdominal injury discovered on CT scan should be discussed with the appropriate clinical team (e.g., surgeons, paediatricians) or regional paediatric Major Trauma Centre depending on local pathways.

References

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3. Clinical Radiology Major paediatric trauma radiology guidance. RCR October 2024. https://www.rcr.ac.uk/our-services/all-our-publications/clinical-radiology-publications/major-paediatric-trauma-radiology-guidance/. Accessed 24.10.2024.