MANAGEMENT OF PARENCHYMAL ABDOMINAL ORGAN INJURIES IN CHILDREN – COMPARISON WITH INTERNATIONAL GUIDELINES

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Abstract

Trauma is a leading cause of death in childhood, with abdominal injuries accounting for a significant proportion of cases. The most common mechanism is blunt trauma involving the liver, spleen, and kidneys [1]. Anatomical features in children — larger organ-to-body ratio, thinner abdominal wall, and richer vascularization — make them more vulnerable even to minor impact.

The aim of this study is ..., evidence-based approach ...d treatment of parenchyma...n children and to compar...n international standards.

Materials and method...

A retrospective analysis ...n children with blunt abdominal trauma and involvement of parenchymal organs treated at the Department of Pediatric Surgery, University Hospital "St. George" – Plovdiv, over a 10-year period (2015–2025). The type of trauma, hemodynamic status, treatment modality, and outcomes were evaluated.

Conclusion

Parenchymal abdominal organ injuries in children require precise assessment and timely management. Non-operative treatment is highly effective and has become the standard of care for stable patients. Surgical intervention remains reserved for hemodynamically unstable cases. Comparison with international guidelines demonstrates a high degree of concordance between Bulgarian clinical practice and the established standards of Oxford, Bambino Gesù, and Johns Hopkins. The implementation of formalized protocols and wider use of angiographic embolization in selected cases are recommended.

Results

The mean age of patients was 9.2 years.

Non-operative management (NOM) was successful in 88% of hemodynamically stable cases. Surgical intervention was required in 12% due to persistent bleeding.

Diagnostic approach

Timely diagnosis is critical, as the clinical picture is often nonspecific. The main signs of internal bleeding include tachycardia, pallor, hypotension, and abdominal distension.
FAST ultrasound plays an important role but has limited sensitivity in children. Contrast-enhanced computed tomography (CT) remains the gold standard, allowing for injury grading.

Management of stable patients

In hemodynamically stable children, non-operative management (NOM) is the standard of care, regardless of injury grade.
Key components include continuous monitoring of vital signs, serial abdominal examinations, and follow-up imaging when necessary.
Success rates exceed 90% in most published series

Management of unstable patients

In cases of persistent hypotension or active bleeding, surgical intervention is indicated — most commonly splenectomy, hemostatic suturing, packing, or, rarely, partial hepatectomy
For stable patients with ongoing bleeding, angiographic embolization is a modern minimally invasive alternative.

Control of blood loss and resuscitation

Resuscitation follows ATLS (10th Edition, 2018) principles — early recognition and management of hypovolemia
Balanced transfusion (packed red cells, plasma, platelets) is preferred over massive crystalloid infusion to avoid dilutional coagulopathy.
In massive hemorrhage, *damage control surgery* remains a life-saving strategy

Comparison with International Guidelines

Oxford Children's Hospital (United Kingdom)

The 2023 Oxford University Hospitals NHS Foundation Trust guideline recommends prioritizing NOM for all stable patients, including those with high-grade injuries (Grade IV–V), strict ICU observation protocols, and minimizing unnecessary CT scans
The findings of the present study are fully consistent with this approach.

Ospedale Pediatrico Bambino Gesù (Rome, Italy)

The 2022 Italian guideline emphasizes a multidisciplinary team approach, limiting blood transfusions, and encouraging early mobilization after stabilization [10].
Our center's results are similar, with the only difference being a slightly longer hospital stay due to organizational factors.

Johns Hopkins Hospital (USA)

The 2023 Johns Hopkins protocol introduces a point-based risk stratification system (JH-PAS) for selecting NOM, damage control resuscitation, and broad application of interventional radiology for splenic and hepatic lesions [11].
The success rate of NOM in our study (88%) is entirely comparable with U.S. data (85–92%).