



Clinical outcomes of patients with hollow viscous injuries after a blunt abdominal trauma: the influence of diagnostic and therapeutic delay and the predictive role of BIPS

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Dear Sir,

We read with great interest the article by Harmston et al. about the clinical effects of delayed treatment of hollow viscous injuries (HVI) due to blunt abdominal trauma [1]. The results of their systematic review confirmed the diagnostic challenge of these lesions with a frequent delay of surgical treatment. The Cox regression analysis demonstrated that an early operation significantly decreased the mortality rate (1 out of 11 studies) while a delayed operation increased the morbidity rate (5 out of 9 studies). Confounding factors were the definition of delayed intervention, due to different time intervals considered in the different study, and the presence of other organ additional injuries. The authors underlined the importance of an early treatment to improve the outcome of patients with HVI after a blunt abdominal trauma, but at the same time, claimed the need of a consensus on the definition of delayed intervention, and of future investigations on early detection and treatment of patients with isolated viscous injury.

In 2017, we published the results of our experience with 169 patients who presented a traumatic HVI [2]. Our research highlighted the unfavorable effect on clinical outcomes of delayed diagnosis and surgical treatment. Mortality and morbidity rates were 15.9% and 36.1%, respectively, and the mean length of staying was 23 ± 7 days. Delay of treatment was not a prognostic indicator for postoperative mortality, while morbidity was strongly and independently related to an early leucocytosis and to a delay of treatment > 6 h. The mean delay of treatment for patients with HVI who

developed postoperative complications was 22.5 ± 3.6 h, compared to 6.1 ± 1.4 h for uncomplicated patients.

In the attempt to identify predictive cut-off and threshold values in treatment delay for morbidity, through the ROC curve analysis, we observed positive predictive values for postoperative morbidity of 73.5% and 100% for a treatment delay of 12 and 24 h, respectively.

In the group of patients with HVI after a blunt abdominal trauma, we tested also the predictive value of the Bowel Injury Predictive Score (BIPS). This score was recently introduced [3] to predict the risk of bowel injury when more than two of the following parameters are present at ER admission: (1) high-grade mesenteric injury at admission CT scan, (2) increased WBC ($> 17,000$), and (3) abdominal tenderness. BIPS resulted in an independent predictor of outcome and patients with a value > 2 had a significant probability ($p = 0.029$) to develop a postoperative complication compared to patients with a BIPS < 2 .

In conclusion, in our hands, a delay of diagnosis and treatment of HVI after a blunt abdominal trauma was an independent predictor of morbidity, strongly affecting the postoperative course. Adoption of BIPS seems very useful to increase the diagnostic sensitivity and reduce the treatment delay to less than 6–12 h after ER admission.

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Compliance with ethical standards

Conflict of interest Andrea Mingoli, Gioia Brachini, Marco La Torre, Bruno Cirillo and Paolo Sapienza declare that they have no conflict of interest.

Ethical approval The research was undertaken according to the Italian Privacy Laws concerning collection, storage, and analysis of private data. A formal Institutional Research Ethics Board (Sapienza University and S. Giovanni Addolorata Hospital) approval was not required because of the noninterventional, retrospective, and anonymous study design.

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Informed consent A signed consent for the treatment and the analysis of data for scientific purpose was obtained from all patients or relatives either at admission or as soon as they could give it.

References

1. Harmston C, Ward JBM, Patel A. Clinical outcomes and effect of delayed intervention in patients with hollow viscus injury due to blunt abdominal trauma: a systematic review. *Eur J Trauma Emerg Surg.* 2018;44:369–76.
2. Mingoli A, La Torre M, Brachini G, Costa G, Balducci G, Frezza B, Sgarzini G, Cirillo B. Hollow viscus injuries: predictors of outcome and role of diagnostic delay. *Ther Clin Risk Manag.* 2017;13:1069–76.
3. McNutt MK, Chinapuvvula NR, Beckmann NM, et al. Early surgical intervention for blunt bowel injury: the Bowel Injury Prediction Score (BIPS). *J Trauma Acute Care Surg.* 2015;78(1):105–11.