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ORIGINAL ARTICLE

Reliability and reproducibility of the American Association for the Surgery of Trauma scaling for renal injury and impact on radiologic follow-up



Fiabilité et reproductibilité de la classification de l'American Association for the Surgery of Trauma et impact sur le suivi radiologique des traumatismes rénaux

Q.-B. Phan^{a,*}, E. Mourey^a, L. Estivalet^b, B. Delattre^a,
F. Bardet^a, O. Chevallier^b, D. Louis^c, L.S. Aho^d,
R. Loffroy^b, L. Cormier^a

^a Urologie, CHU François-Mitterand, Dijon, France

^b Radiologie, CHU François-Mitterand, Dijon, France

^c Chirurgie pédiatrique, CHU François-Mitterand, Dijon, France

^d Épidémiologie, CHU François-Mitterand, Dijon, France

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KEYWORDS

CT scanner;
Kidney;
Scale;
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Summary

Introduction. – The American Association for the Surgery of Trauma (AAST) Organ Injury Scale (OIS) is the most used classification for renal trauma. It determines the radiologic monitoring, only recommended for high-grade injuries. The aim of this study was to assess the subjectivity of AAST scaling and its impact on short-term follow-up.

Methods. – We retrospectively reviewed all patients with blunt renal injuries admitted at a university hospital between 2010 and 2015. Computed Tomography (CT) scan were analyzed and injuries graded according to AAST OIS independently by a senior radiologist, a senior urologist

* Corresponding author.

E-mail addresses: quangbao.phan@gmail.com, quangbao.phan@chu-dijon.fr (Q.-B. Phan), eric.mourey@chu-dijon.fr (E. Mourey), louis.estivalet@gmail.com (L. Estivalet), bendelattre@gmail.com (B. Delattre), florian.bardet@chu-dijon.fr (F. Bardet), olivier.chevallier54@gmail.com (O. Chevallier), ldavid06@hotmail.com (D. Louis), ludwig.aho@chu-dijon.fr (L.S. Aho), romaric.loffroy@chu-dijon.fr (R. Loffroy), luc.cormier@chu-dijon.fr (L. Cormier).

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who was blind to clinical data and a resident urologist. Grading disagreements were analyzed collegially to obtain a final rating. The agreement of AAST scaling was evaluated through the Cohen's Kappa coefficient.

Results. — Ninety-seven patients had 101 renal injuries: low grade in 58.4% (11.9% grade I, 17.8% grade II, 28.7% grade III) and high grade in 41.6% of cases (23.6% grade IV and 17.8% grade V). The agreement was fair with Kappa coefficient at 0.36. The agreement was moderate in severity sub-division analysis (low or high grade): Kappa coefficient at 0.59. There was a disagreement in 49.5% between the senior urologist's and the senior radiologist's ratings. Those differences brought to a severity group change and radiologic follow-up modification in 34% ($n=17$).

Conclusion. — AAST OIS for renal trauma suffers from subjectivity but is improved by severity sub-group analysis. This subjectivity influences the radiologic follow-up but could be reduced by collegiate rating.

Level of evidence.— 4.

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MOTS CLÉS

Classification ;
Rein ;
Scanner ;
Subjectivité ;
Traumatisme

Résumé

Introduction. — L'American Association for the Surgery of Trauma (AAST) Organ Injury Scale (OIS) est la classification des traumatismes rénaux la plus utilisée. Elle conditionne le suivi radiologique des lésions de haut grade. L'étude évalue la subjectivité de la classification AAST et son impact sur le suivi radiologique.

Matériel. — Étude rétrospective des traumatismes rénaux fermés pris en charge dans un CHU entre 2010 et 2015. Le scanner a été relu et la lésion rénale gradée selon la classification AAST indépendamment par un radiologue, un urologue en aveugle de la clinique et un interne d'urologie. Une classification finale a été obtenue après relecture collégiale des cas discordants. L'accord de classification AAST a été évalué grâce au coefficient Kappa.

Résultats. — Quatre-vingt-dix-neuf patients ont présenté 101 lésions rénales : de bas grade dans 58,4 % (grade I 11,9 %, grade II 17,8 %, grade III 28,7 %) et de haut grade dans 41,6 % (grade IV 23,6 %, grade V 17,8 %). L'accord entre classifications était acceptable : coefficient Kappa de 0,36. L'accord était modéré en analyse par sous-groupes de sévérité : coefficient Kappa à 0,59. On retrouvait un désaccord entre les classifications du radiologue et de l'urologue dans 49,5 %. Ces discordances entraînaient un changement de groupe de sévérité et de surveillance radiologique dans 34 % ($n=17$).

Conclusion. — La classification AAST est subjective mais améliorée en analyse de sous-groupe de sévérité. Cette subjectivité entraîne des variations du suivi radiologique mais pourrait être limitée par une analyse collégiale des scanners.

Niveau de preuve.— 4.

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Introduction

Surgical management with a high risk of nephrectomy was previously the main management of renal trauma [1]. In order to avoid renal unit loss and to preserve renal function, conservative management has risen. It was allowed by improvements of interventional radiology, endourology and Computed Tomography (CT) scan.

CT scan is the gold standard for initial evaluation of renal injury in stable [2,3] or even unstable patients [4]. It allows an accurate assessment of the renal injury type and extension. The American Association for the Surgery of Trauma (AAST) Organ Injury Scale (OIS) is the most used classification to sort kidney injuries (Appendix 1) [5]. This 5-grade scale is a predictive way to assess morbidity, mortality, need for surgery and for nephrectomy with increasing grade [6–8].

Renal trauma management depends on CT scan findings. Indeed, AAST scale has a central place in modern management algorithms. According to international guidelines, high-grade injuries should be treated, if possible, conservatively and should have a control CT scan 48–96 h after the trauma to minimize the risk of missed complications [2,3].

However, using AAST OIS could be difficult since CT scan analysis is subjective [6,9]. For example, it could be hard to distinguish a grade V injury from a kidney with multiples grade III or IV injuries (Fig. 1).

We hypothesize that the AAST grading for renal trauma has significant interpersonal variability. A rating mistake could drive to an inadequate radiologic monitoring and potential morbidity. The principal aim of the study was to assess the subjectivity of AAST OIS rating and the impact on radiologic monitoring.

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