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SCIENTIFIC LETTERS

Which multi-trauma patients benefit from performing a total-body CT?☆

¿Qué pacientes politraumatizados graves se benefician de la realización de un *total-body CT*?

Dear Editor,

Severe traumas are an important cause of morbimortality, being blunt traumas, and traffic accidents the most common etiologies in our setting.[1] Even though the non-surgical management of these patients is widely indexed in medical literature, today there is still controversy on the indications of *total-body CT scans*, and, actually, on some occasions, it is determinant to establish surgical management.

After obtaining the patient's informed consent, we hereby present the case of one multi-trauma individual who was in serious condition after a motorcycle crash, with non-surgical management of the patient's thoracoabdominal lesions and satisfactory progression.

Male; 32 years old; no significant clinical history; the driver was wearing a helmet and suffered from high-energy trauma due to motorcycle crash with further ejection from the vehicle. After initial assessment following the ATLS principles and confirmation of airway patency; good ventilation; hemodynamic stability; and absence of severe CET, the patient was transferred to a trauma reference center.

We conducted the initial assessment upon arrival: patient alert, oriented, and speaking in a coherent manner. Good airway patency with cervical protection; spontaneous respiration rate at 18 bpm; symmetrical respiratory movement pattern; absence of external signs of cervical and thoracic lesions; and normal percussion, and lung auscultation. The patient remains hemodynamically normal at 80 bpm; normothermic; with adequate pulse; capillary refill; and cutaneous-mucosal coloration. The possible bleeding focus may come from one right, displaced, humeral, diaphisary fracture that is immobilized after the administration of anti-tetanus prophylaxis. At abdominal level, there is diffuse pain at palpation, without any signs of peritonism, or pain in the pelvis. The patient shows macroscopic hematuria with spontaneous micturition, but without any visible perineal alterations, which is why we did not proceed with the catheterization of the gallbladder at that time. The X-rays from the chest (Fig. 1A), and the pelvis look normal.

The neurological assessment confirmed the presence of symmetrical reactive pupils; a score of 15 in the Glasgow Coma Scale; and no signs of lateralization or spine injury.

The secondary survey analyzed the skin surface, and cleaned and sutured wounds in the lower lip region; jaw; right forearm; and right ankle.

In this context, we conducted one *total-body CT scan* that found multiple lesions: rupture of the descending thoracic aorta type IV with pseudoaneurysm; periaortic hematoma; small left hemithorax (Fig. 1B); posterior splenic lacerations grade II; hepatic lacerations grade II in segment V with signs of active bleeding (Fig. 2A); right posterior–superior renal laceration grade IV (Fig. 2B); and gallbladder microperforation grade I. There was no damage to the axial skeleton or the pelvic girdle, but there were left and sternal nondisplaced mandibular fractures.

The urgent percutaneous placement of one aortic endoprosthesis (Fig. 1C) followed by hepatic, renal, and splenic selective arteriography is suggested, but in the absence of active bleeding, a decision is made to implement conservative therapy of the abdominal lesions. The gallbladder lesion is managed through the gallbladder catheter that is kept during the whole hospital stay. Also, the surgery of the mandibular fracture is ruled out due to the lack of lateral deviation; pain; or opening/closing alterations.

The patient was then transferred to the ICU for monitoring and fluid therapy. Left endothoracic drainage was placed at a volume of 500 cc of hematic fluid for 24 h to be removed after 72 h and once the resolution was confirmed radiologically. The patient was extubated at day 4, and at day 5 both the surgical internal fixation of the humeral fracture, and the escharotomy of the right ankle lesion were conducted, resulting in a cutaneous defect of approximately 10 cm with exposure of the superficial peroneal nerve.

At day 8, one control CT scan is conducted that confirms the good progression of the aortic, hepatic, and renal lesions (Fig. 2C), and the disappearance of the splenic and gallbladder lesions.

The patient was then taken to his room and discharged from the hospital 10 days later. He required one graft at the back side of his right foot–procedure that was conducted outpatiently, followed by one kinesiotherapy rehabilitation program, and infiltration of the posterior tibial nerve.

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Figure 1 (A) Chest X-ray at hospital admission showing no significant alterations. (B) The arrow shows the descending thoracic aortic incomplete lesion with pseudoaneurysm, prior to the endovascular procedure. (C) Correct endovascular prosthesis implantation.

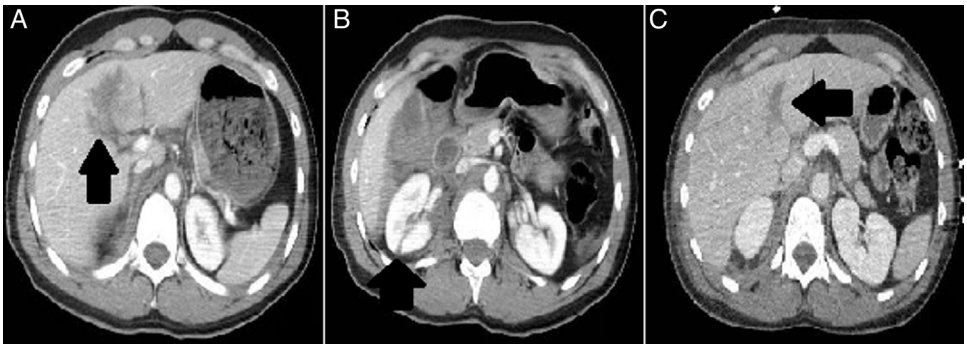

Figure 2 (A) The arrow shows one hypodense area in the hepatic segment V that is consistent with the hepatic lesion reported. (B) The arrow shows one right renal lesion at posterior-superior level. (C) The control CT scan conducted at day 8 confirms that the hepatic lesion has reduced its size and shape.

At present, 30 months after being discharged from the hospital, the patient shows no significant sequelae.

In our setting, we use different anatomical scoring systems, among them the Injury Severity Score (ISS), or the Anatomic Profile (AP) that, in our patient, scored 45 and 15.85 points, respectively. In order to calculate these scoring systems, one *total-body CT scan* is required,[2] although recent publications show that the systematic use of such systems does not reduce mortality compared to the use of conventional imaging modalities.[3] However, the identification of possible subgroups that could benefit from the use of the aforementioned scoring systems is still pending. We believe that in the case of a severe hemodynamically stable multi-trauma with unfavorable kinematics of trauma such as the case of a motorcycle crash at a speed of more than 32 km/h with driver ejected,[4,5] conducting one *total-body CT scan* would certainly benefit and guide the therapeutic plan.[6] Upon hospital arrival, both the examination of the patient and his chest X-rays were normal, so had the *total-body CT scan* not been conducted, the aortic lesion would have never been found.

The finding of minimum aortic lesions on CT scans can make us opt for medical management. In more advanced lesions in patients selected with no risk of imminent free aortic rupture, the endovascular therapy is feasible,[7] whose optimal time will depend on concomitant lesions and the resources available at the medical center. In the case of pseudoaneurysmatic lesions like our patient's lesion with damage to less than 50 per cent of the aortic circumference, an early repair may not be necessary in an attempt to improve the patient's condition and plan endovascular control with higher chances of success.[8]

ICU admissions are essential if we want to optimize the patient's hemodynamic situation; medical management during and after the procedure; and, also, if we want to monitor serious concomitant lesions.[9] The prognosis has improved in these selected cases, especially in younger patients, being the radiological confirmation useful for their resolution.

In sum, although today there is still controversy on which multi-trauma patients should be eligible for one *total-body CT scan*, we believe that when in the presence of one multi-trauma hemodynamically stable patient with unfavorable kinematics of trauma, conducting one *total-body CT scan* is advisable, because it can avoid misdiagnoses of important lesions, and is essential to plan minimally invasive management.

Authors

Ms. Sandra Dios, and Ms. Virginia Durán conducted the reference search and shaped this manuscript.

Mr. Felipe Pareja, and Ms. Virginia Durán suggested the case and provided ideas on study design and concept.

Mr. Felipe Pareja, Ms. Cristobalina Martín, Ms. Mercedes Rubio, and Mr. Francisco Javier Padillo conducted the paper critical review and provided relevant know-how.

All authors gave their approval to the final version of this paper.

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Interhospital transfers of a mobile team for organ preservation with extracorporeal membrane oxygenation in controlled donors after circulatory death☆

Desplazamientos interhospitalarios de un equipo móvil para preservación de órganos con oxigenación por membrana extracorpórea en donantes en asistolia controlada

Dear Editor,

Since the publication of the ''2012 National Consensus Document on Donation in Asystole'',[1] and ever since the ''Royal Decree 1723/2012''[2] became effective back in January, 2013 the programs of controlled asystole donations (CAD) in Spain have grown exponentially.

CAD have become the most obvious way to expand the number of transplants with a total of 370 donors in 2016, which is a 75 per cent increase compared to the previous year. This type of donation amounts to 18 per cent of the total of deceased donors, that is, one out of every five donors is a donor in controlled asystole. At present, a total of 68 Spanish hospitals have active programs on this type of donation.[3]

As it occurs with encephalic death donations (EDD), the role that intensivists play in the management of CAD is essential. Most CAD occur in patients in situations of catastrophic neurological damage with need for mechanical ventilatory support who remain hospitalized in our units, and whose families have accepted their decision of life support treatment limitation (LSTL). In some cases, the withdrawal of all measures is conducted after treatment has been rejected following the explicit wishes of the patient or his/her representatives.

The normothermal abdominal perfusion (NAP) with extracorporeal membrane oxygenation (ECMO) has been the most widely used preservation method for the last few years (22 per cent in 2015) for various reasons: there is a wide experience using it in uncontrolled asystole donations (UCAD); the surgical technique is similar to the one used with EDD; it is less conditioned by the donor's anatomy; there is a possibility of conducting intraoperative assessments of the donor's organs with expanded criteria; and there is the possibility of conducing intraoperative biopsies for organ assessment. The 2015 results suggest a lower delayed graft function and a higher survival rate of the hepatic graft whenever ECMO systems are used as a preservation method.[4]

The Spanish experience with the use of NAP with ECMO for the management of UCAD has encouraged other countries like Great Britain[5] and the United States[6] to use it as a preservation method for CAD. In the experience of the University of Michigan,[6] the results achieved in renal, hepatic, and pancreatic transplants are the same as in EDD, and far

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