Testicular rupture after scrotal trauma

Sir,

Scrotal trauma may represent a diagnostic challenge because of the difficulty of exploring an inflamed and painful scrotum. To rule out severe trauma and make management decisions (conservative or surgical treatment), the imaging test of choice is ultrasound[1].

A 27 year-old man visited the emergency department for intense pain in the left testicle after direct non-penetrating trauma (a kick) while playing football 48 hours before. Physical examination was limited due to the large scrotal hematoma, inflammation and pain, despite analgesia, so ultrasound imaging (Figure 1) was requested. The left testicle showed heterogeneous echo-structure and disruption of the tunica albuginea, suggestive of testicular rupture.

Scrotal trauma may cause highly variable lesions (from testicular edema to testicular rupture)[1] and is the third most frequent cause of acute scrotum[2]. Usually unilateral, the right testis is more commonly affected[3]. Direct trauma while playing sport accounts for over 50 % of testicular blunt trauma. According Cass et al.[4], the incidence of testicular rupture in closed scrotal trauma is high (45%). In the series of 65 cases of blunt scrotal trauma seen at the General Hospital in San Francisco, 82% were associated with testicular or peritesticular lesions[5].

Ultrasound is the imaging technique of choice and should be performed with caution to identify the components of the scrotum, determine their integrity and, in case of injury, specify the location and importance. Ultrasound demonstration of tunica albuginea discontinuity, with alteration of the echostructure and testicular outline, has a specificity and sensitivity for the diagnosis of testicular rupture of 100% and 93.5 %, respectively[6,7].

More than 80% of testicular rupture evolve favorably if surgical repair is performed within 72 hours[8]: testicular viability is achieved with parenchymal preservation and testicular hormonal function, as well as decreased late complications (chronic pain, testicular atrophy or orchiectomy)[9].

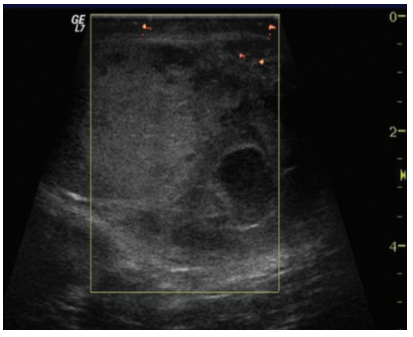

Figure 1. Ultrasound image showing left testicle rupture, with tunica albuginea discontinuity. No intratesticular vascularization was observed.

Emergency physicians should be aware of the different treatment of scrotal trauma and that Doppler ultrasound helps safely select those patients requiring early surgery: testicular rupture, testicular torsion, testicular ischemia due to compression by large hematomas or severe post-traumatic epididymitis[1].

References

1 Fernández-Usagre FJ, Rangel-Villalobos ME, García de la Oliva A, Blanco Yun A. Ecografía *doppler* del traumatismo escrotal. Radiología. 2006;49:183-7.

2 Ragheb D, Higgins JL Jr. Ultrasonography of the scrotum: technique, anatomy, and pathologic entities. J Ultrasound Med. 2002;21:171-85.

3 Mulhall JP, Gabram SG, Jacobs LM. Emergency management of blunt testicular trauma. Acad Emerg Med. 1995;2:639-43.

4 Cass AS, Ferrara L, Wolpert J, Lee J. Bilateral testicular injury from external trauma. J Urol. 1988;140:1435.

5 Buckley JC, McAninch JW. Diagnosis and management of testicular ruptures. Urol Clin Am. 2006;33:111-6.

6 Bucley JC, McAninch JW. Use of ultrasonography for the diagnosis of testicular injuries in blunt scrotal trauma. J Urol. 2006;175:175-8.

7 Bhatt S, Dogra VS. Role of US in testicular and escrotal trauma. Radiographics. 2008;28:1617-29.

8 Lupetin AR, King W 3rd, Rich PJ, Lederman RB. The traumatized scrotum: ultrasound evaluation. Radiology. 1983;148:203-7.

9 Tolosa Eizaguirre E, Robles García JE, Lorente Pérez J, Rincón Mayans A. Consulta diferida de un traumatismo escrotal. Actas Urol Esp. 2010;34:641-3.

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Reversible posterior leukoencephalopathy syndrome

Sir,

The most serious acute complication of hypertension is hypertensive encephalopathy (HE). A variant of this syndrome has recently been described: reversible posterior leukoencephalopathy syndrome (RPLS), which may present with concrete neurological disorders, requiring magnetic resonance imaging (MRI). Failure to detect RPLS may result in severe alterations[1]. We present a case from an out-of-hospital setting which was highly suggestive of this syndrome.

A 74 year-old woman was attended by the out-of-hospital emergency medical services, called because she was unconscious. On arrival, she was in a state of stupor; family members reported that she suffered from hypertension. She presented generalized weakness in all 4 limbs, aphasia and right anisocoria of 2 mm. Glasgow Coma Scale score was 9 and blood pressure (BP) in both arms was 270/120 mmHg. Before receiving any treatment the anisocoria corrected itself, and the patient began to stammer unintelligible words. In the ambulance, BP was 220/100 mmHg and she began to show signs of orientation. She was managed conservatively and no medication was administered. At 25 minutes after EMS attention, BP was 180/90 mmHg and she was perfectly oriented. At 37 minutes she reached the hospital asymptomatic. Computed tomography (CT) scan showed no significant abnormalities; the patient was admitted for observation and further studies showed no significant alterations.

RPLS presents with headache, altered mental status and visual alterations. This syndrome is reversible in most cases if adequate therapeutic measures are taken, but failure to recognize and treat it can result in acute stroke[2]. RPLS is a radiological clinical entity included within HE, but white matter alterations suggestive of edema have been identified3. Etiology includes hypertension, eclampsia and immunosuppressive therapy. Sudden elevations of BP may exceed cerebral circulation self-regulation mechanisms in certain regions[3]. The edema is reduced when BP diminshes[4]. It is thought that EH-RPLS has the same pathophysiological mechanisms as eclampsia.

The diagnosis of HE-RPLS is based on clinical symptoms and BP findings. The most common symptoms are headache, neurological and visual alterations, but there may be seizures or vomiting. Some patients may develop stupor or coma, or Anton's syndrome[4].

The differential diagnosis of SLPR includes stroke, metabolic encephalopathy, cerebral venous thrombosis, encephalitis or demyelinating disease. In patients with a focal neurologic deficit, RPLS can be difficult to distinguish from cerebral posterior artery infection. It can also be difficult to differentiate from transient ischemic attack, distinguished from it by focal type.

Although initial management should be the same as in cases of stroke, hypertension in RPLS can cause more damage[3]. One should closely monitor the patient's evolution for neurological alterations and RPLS should be suspected when there is high BP, no clear neurologic focus and secondary to the above-mentioned etiologies.

References

1 Ayoub M. Posterior reversible encefalopathy síndrome. A variant of hypertensive encefalopathy. J Clin Neurosci. 2006;13:590-6.
2 Tsung-Pai T, Zui-Shen Y, Cheng-Chung F, Shyr-Chyr C, Wen-Jone C. Hypertensive Encefalopathy. J Emerg Med. 2004;27:85-6.
3 Hinchey J, Chaves C, Apignani B, Breen J, Pao L, Wang A, et al. A Reversible posterior Leukoencephalopathy Síndrome. N Engl J Med. 1996;334:494-500.
4 Garg RK. Posterior leukoencephalopathy syndrome. Postgrad Med J. 2001;77:22-8.

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Emergency department 3-dimensional computed tomgraphy in the examination of body parckers

Sir,

The detention of drug smugglers is common in Spain given its geographical location[1]. Body packers (intra-abdominal transporters of drugs) are common[2,3], but there are others such as "body pushers" (rectal or vaginal transporters) and "implanted body pushers" (surgically implanted)[4]. Typically, body packers carry heroin or cocaine in solid or liquid form, and hashish is less common[2,5]. Potential clinical manifestations of intra-abdominal drug transport are intestinal obstruction and intoxication. Emergency department (ED) access to three-dimensional (3D) computed tomography (CT)[6] facilitates visualization and diagnosis of these cases and the complications that may arise in body packers. We report the first case of body packing with hashish packs detected using 3D CT scan which clarified the diagnosis.

A 54 year-old man presented to the ED with abdominal pain and reported having ingested 80 "hashish balls" three days before, in Morocco. Plain radiography showed radiopaque bodies with no clear signs of obstruction. 3D CT scan showed numerous ovoid bodies measuring 2 x 3.5 cm in the splenic flexure, descending colon, sigmoid and rectal ampoule, and dilatation of the small bowel loops (Figure 1). Toxicological blood test was negative but the presence of hashish was retrospectively shown (Figure 2). The patient was admitted for intervention due to the obstruction observed on 3D CT scan.

Intestinal obstruction appears in 0.3 to 5 % of body packers, representing the main complication in transporters of hashish. However, it is rare in those carrying liquid cocaine[5,7]. Hollow visceral perforation and gastrointestinal bleeding have also been reported[8]. The patient suffered intestinal obstruction and segmental intestinal ischemia (seen during surgery) probably related to intestinal wall pressure exerted by the numerous hashish packs. The therapeutic management of these cases is not always clear, and we believe that 3D CT can help emergency physicians and surgeons in decision making.

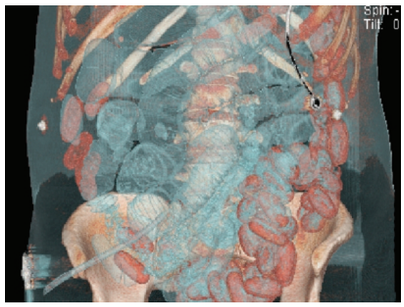

Figure 1. Three-dimensional reconstruction of the abdominal computed tomography image showing ovoid packs distributed in the small bowel and severe dilated bowel loops in a body packer.

Figure 2. Ovoid pack removed from a body packer. Hashish resin paste was found inside.

References

1 Dueñas Laita A, Nogué S, Burillo-Putze G. Body Packing. N Engl J Med. 2004;350:1260-1.
2 Magaldi M, Nogué S, Coll-Vinent B, Ibarzábal A. *Body packer:* dificultades diagnósticas en una situación de alto riesgo. Emergencias. 2009;21:158-9.
3 Madrazo Z, Silvio-Estaba L, Secanella L, García-Barrasa A, Aranda H, Golda T, et al. *Body packer:* revisión y experiencia en un hospital de referencia. Cir Esp. 2007;82:139-45.
4 Madrazo González Z, Muñoz Campaña A, Carrasco López C, Chavarría Marín FA, Jacob Rodríguez J, Bardés Fobles I. *Implanted body packer:* nueva modalidad de transporte intracorporal de drogas. Emergencias. 2013;25:156-7.
5 López Rincón RM, Martínez F, Parreño D, Plaza Lloret M, Aladrén M, Pardo MG. Obstrucción intestinal por bolas de cocaína líquida. Emergencias. 2013;25:155-6.
6 Fischman EK, Magid D, Ney DR. Three dimensional imaging. Radiology. 1999;181:321-7.
7 Burillo-Putze G, Becker LT, Rodríguez MG, Torres JS, Nogué S. Liquid cocaine body packers. Clin Toxicol (Phila). 2012;50:522-4.
8 Traub SJ, Hoffman RS, Nelson LS. Body packing-the internal concealment of illicit drugs. N Engl J Med. 2003;349:2519-26.

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Pneumomediastinum associated with whiplash injury

Sir,

Pneumomediastinum in the context of cervical acceleration-deceleration or whiplash is very rare; soft neck tissue injuries are generally predominant. Cervical spine radiology generally allows diagnosis of whiplash[1] and possible complications such as pneumomediastinum.

A 25 year-old man with unremarkable medical history visited the emergency department (ED) with a typical clinical picture of whiplash after a motor accident ending off the road. The patient was wearing a properly positioned seat belt. Besides the usual cervical pain, he suffered odynophagia and anterior neck pain. Physical examination only showed injury to the cervical paravertebral musculature. On routine anteroposterior and lateral x-ray of the neck (Figure 1), a layer of prevertebral air was observed. This prompted a new assessment, without subcutaneous crepitus being found, and a computed tomography (CT) scan which showed pneumomediastinum affecting the distal third of the esophagus. With a diagnosis of pneumomediastinum secondary to whiplash, the patient was directed to the reference hospital for further study.

Traffic accidents may result in various kinds of cervical injuries. The Quebec Task Force on whiplash-associated disorders[2] has graded these injuries (from 0 to 4 points) as follows. Grade 0: no neck pain, stiffness, or any physical signs are noticed; Grade 1: neck complaints of pain, stiffness or tenderness only but no physical signs are noted by the examining physician. Grade 2: neck complaints and the examining physician finds decreased range of motion and point tenderness in the neck. Grade 3: neck complaints plus neurological signs such as decreased deep tendon reflexes, weakness and sensory deficits. Grade 4: neck complaints and fracture or dislocation, or injury to the spinal cord. In general, rear impact accidents first produce hyperextension followed by sharp contraction of sternocleidomastoid muscles and then forced hyperflexion of the neck.

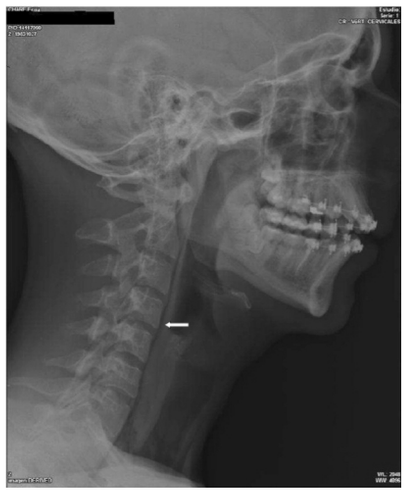

Figure 1. Prevertebral air line (arrow) as a manifestation of pneumomediastinum in a case of cervical whiplash.

The incidence of spontaneous pneumomediastinum in the ED is low[3-6], although it is probably underdiagnosed in young people[7]. It is extremely unusual after an accident producing cervical whiplash. The most common mechanism involved in pneumomediastinum is sudden increase in intra-alveolar pressure associated with increased intra-thoracic pressure[3]. Seatbelt compression in a patient with a closed glottis increases pressure similar to that produced by the Valsalva maneuver. When this exceeds pulmonary vasculature pressure, alveolar rupture at the base may occur[3,4]. Consequently, this can cause air outlet to the hila and produce pneumomediastinum and/or pneumothorax and even subcutaneous emphysema[3-6].

References

1 Jiménez MA, Ayala MA, Burillo G. Radiología simple en el síndrome de latigazo cervical. Emergencias. 2004;16:175-7.
2 Spitzer WO, Cassidy JA, Duranceau J, Salmi LR, Skovron ML, Suissa S, et al. Scientific monograph of the Quebec Task Force on whiplash-associated disorders: redefining "whiplash" and its management. Spine. 1995;20:1S-73S.
3 Mihos P, Potaris K, Gakidis I, Mazaris E, Sarras E, Kontos Z, et al. Sports-related spontaneous pneumomediastinum. Ann Thorac Surg. 2004;78:983-6.
4 Langwieler T, Steffani KD, Bogoevski DP, Mann O, Izbicki JR. Spontaneous Pneumomediastinum. Ann Thorac Surg. 2004; 78:711-3.
5 Abolnik I, Lossos IS, Breuer R. Spontaneous pneumomediastinum. A report of 25 cases. Chest. 1991;100:93-5.
6 Yellin A, Gapany-Gapanavicius M, Lieberman Y. Spontaneous pneumomediastinum: is it a rare cause of chest pain? Thorax. 1983;38:383-5.
7 García de Lucas MD, Jurado B, Trujillo AJ. ¿Es tan infrecuente el neumomediastino espontáneo en urgencias. Emergencias 1998;3:206-7.

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Iatrogenic acute confusional state in a girl

Sir,

Anticholinergic syndrome may occur secondary to the use of muscarinic receptor antagonists for acetylcholine (biperiden)[1]. Clinical presentation may vary greatly, with central and peripheral components. The former include disorientation, agitation and respiratory depression and even coma. Peripheral symptoms include tachycardia, anhidrosis, paralytic ileus, urinary retention and hypertension[2].

A 7 year-old girl (42 kg) was attended in the emergency department: she had an acute infectious process with fever and vomiting, for which she was receiving clebopride (20 mcg / kg / day divided into 3 doses per day). In good general health, she was conscious, oriented, with normal vital signs, cervical hypertonia and head rotation to the right. Initial complementary studies including urine test were normal, except for high CRP. Suspected diagnosis was dystonia secondary to clebopride, and IV biperiden (0.06 mg / kg) was administered. Given the absence of clinical response, a second dose was administered which caused acute confusional syndrome. In the presence of fever, computed tomography (CT) brain scan was performed, under sedation with midazolam, as well as lumbar puncture to rule out infection of the central nervous system (CNS). After 4-6 hours of observation, the patient was asymptomatic.

Biperiden is a centrally acting anticholinergic with vegetative peripheral effects. Its therapeutic effect is produced by competitive antagonism against acetylcholine by cholinergic brain muscarinic receptors. It is indicated for extrapyramidal symptoms due to neuroleptics and orthopramides (metoclopramide, clebopride and domperidone). The recommended dose is 0.04-0.1 mg / kg / dose, with the possibility of repeated administration after 30 min[2].

The orthopramides are prokinetic with agonist action on serotonin 5 - HT4 receptors, and are used as antiemetics since they block dopamine D2 receptors. Extrapyramidal reactions are the main adverse effect due to adverse antidopaminergic activity in the CNS, especially in children and the elderly. In these cases, sudden onset dystonia may occur, mainly affecting the lateral cervical musculature. It is not dose-dependent, but an idiosyncratic reaction. It responds to treatment with biperiden, either single or multiple doses, as needed[3].

In severe poisoning by anticholinergics, physostigmine (a cholinesterase inhibitor) increases acetylcholine levels. This should be administered intravenously at 0.01-0.03 mg / kg / dose by slow infusion; it may be repeated every 5 minutes to get the desired effect, up to a maximum dose of 2 mg. The patient will require close hemodynamic monitoring due to the risk of seizure, cholinergic crises and asystole4. It is contra-indicated in patients with cardiac arrhythmias, urinary or gastrointestinal obstruction and in those receiving tricyclic antidepressants and showing ECG alterations[2]. As an alternative, benzodiazepine has been proposed[5,6].

References

1 Carabaño Aguado I, Pelayo Baeza F, González-Valcárcel Sánchez-Puelles J. Doctor, necesito un antídoto para su antídoto. Un caso de síndrome anticolinérgico por biperideno. An Pediatr (Barc). 2010;72:368-9.
2 Mintegi Raso S. Manual de intoxiaciones en pediatría. Barcelona: Ergón; 2012.
3 Freedman SB, Fuchs S. Antiemetic therapy in pediatric emergency departments. Pediatr Emerg Care. 2004;20:625-32.
4 Frascogna N. Physostigmine: Is there a role for this antidote in pediatric poisonings? Curr Opin Pediatr. 2007;19:201-5.
5 Burns MJ, Linden CH, Graudins A, Brown RM, Fletcher KE. A comparison of physostigmine and benzodiazepines for the treatment of anticholinergic poisoning. Ann Emerg Med. 2000;35:374-81.
6 Shannon M. Toxicology reviews: Physostigmine. A comparison of physostigmine and benzodiazepines for the treatment of anticholinergic poisoning. Pediatr Emerg Care. 1998;14:224-6.

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Anisakiasis: a disease that underdiagnosed because of clinical suspicion is low

Sir,

Anisakiasis is a zoonosis produced by the larvae of A*nisakis simplex*. Humans are accidental hosts of this parasite acquired by eating undercooked infected fish, crustaceans and cephalopods[1,2].

A previously healthy 33 year-old man visited the ED for sudden onset sharp and severe pain in the left iliac fossa and flank, with generalized pruritic maculopapular rash since one day before. He had no fever, diarrhea or vomiting. The abdomen was soft with left flank tenderness, without masses or organomegaly, and bowel sounds were preserved. Laboratory tests showed neutrophilic leukocytosis and slightly elevated CRP; plain abdominal x-ray showed distension of the intestinal loops; abdominal ultrasound showed free peritoneal fluid and computed tomography (CT) scan showed mesenteric and periaortic adenopathy and a bull's eye-like image on the small bowel suggesting invagination (Figure 1). In thorough medical history, the patient reported having eaten raw fish (anchovy) 12 hours before the onset of symptoms. Esophagogastroduodenoscopy showed erythematous and punctate gastric mucosa with several papules, but no parasites were observed. These and radiological images, along with anisakis-specific IgE of 20.5 kU / L (negative to 0.35 kU / L), supported the etiologic diagnosis of gastrointestinal anisakiasis with allergic manifestations. The outcome was favorable and symptoms resolved with simple analgesia, bowel rest and fluid therapy.

The diagnosis of anisakiasis is difficult in the absence of specific clinical symptoms and signs. It mainly depends on high clinical suspicion, compatible anamnesis and follow-up[3,4]. In most cases, anisakiasis is self-limiting, and this has therapeutic implications since the patient will usually benefit from a conservative approach and avoidance of invasive interventions such as surgery5. Despite increased case reports involving different sections of the gastrointestinal tract, anisakiasis is probably underdiagnosed due to lack of clinical suspicion[3,6]. Since positive serology is highly sensitive and specific, it is usually enough to ask about raw fish intake in the last 24-48 hours before symptom onset to obtain a sensitivity and negative predictive value of 98.08% and 98.39%, respectively, with this diagnostic procedure[3].

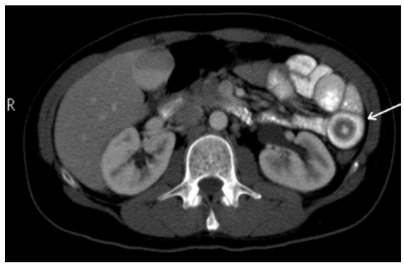

Figure 1. Abdominal CT scan performed in the emergency department showed a bull's eye-like image suggestive of intestinal invagination.

References

1 Burgos Lunar C, Diego Villalón MA, Llorente Díaz E, Novo del Castillo S. Obstrucción intestinal por *Anisakis simplex*. Semergen. 2006;32:141-5.
2 Henríquez Santana A, Villafruela Cives M. *Anisakis:* pasado, presente y futuro. Med Clin (Barc). 2009;132:400-3.
3 Del Rey Moreno A, Valero López A, Gómez Pozo B, Mayorga Mayorga C, Hernández Quero J, Garrido Torres Puchol ML, et al. Utilidad de la anamnesis y de las técnicas inmunológicas en el diagnóstico de la anisakidosis en pacientes con abdomen agudo. Rev Esp Enferm Dig. 2008;100:146-52.
4 Zullo A, Hassan C, Scaccianoce G, Lorenzetti R, Campo S, Morini S. Gastric Anisakiasis: Do not Forget the Clinical History! J Gastrointestin Liver Dis. 2010;19:359.
5 Navarro Cantarero E, Carro Alonso B, Castillo Lario C, Fernández Gómez JA. Diagnóstico de la infestación por *Anisakis*. Experiencia en nuestro medio. Allergol et Inmunopathol. 2005;33:27-30.
6 Vallejo Rodríguez MC, Valero Tena E, Charro Calvillo M, Mur Villacampa M. Dolor abdominal recidivante: afectación gástrica e ileal por anisakis. An Med Interna. 2006;23:556-7.

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Safety when attending accidents involving hybrid vehicles

Sir,

Increasing numbers of motor cars on Spanish roads are equipped with non-conventional or auxiliary engines powered by petrol and battery electric energy or bi-fuel using liquefied petroleum gas (LPG). This techno-

logy involves safety mechanisms that emergency medical services (EMS) should know about to ensure self-protection when attending a traffic accident[1-5]. Cars with electric power are identifiable by the label "Hybrid". These vehicles carry large powerful batteries usually housed at the rear. Energy is transported to the motor by means of high voltage cables which are easily recognizable for their orange color (Figure 1A). Some models' batteries incorporate a detonating system that disconnects them from the power lines. EMS staff should avoid touching any part or element of this color, even when the vehicle engine is switched off, since the high voltage system may remain active up to 10 minutes after disconnection. Other models carry solar panels on the roof; even in the event of an accident, they continue to accumulate energy from the sun, so they should be covered to prevent this.

Bi-fuel vehicles are only identified by components of this technology, such as the auxiliary power valve (Figure 2), housed in the same compartment as the conventional fuel cap, or a fuel tank containing LPG installed in the spare wheel space (Figure 1B). These tanks have a safety valve to relieve any pressure build-up in the event of an accident or fire. This valve points down toward the bottom of the vehicle, so if the car overturns, the valve points upwards or sideways. The biggest problem with this type of fuel is that it is invisible. Although it is stored in liquid form in the tank, LPG is instantly converted into a gaseous state on coming into contact with air, and remains highly inflammable. In addition, this auxiliary tank should be inspected for damage or holes allowing the gas to escape.

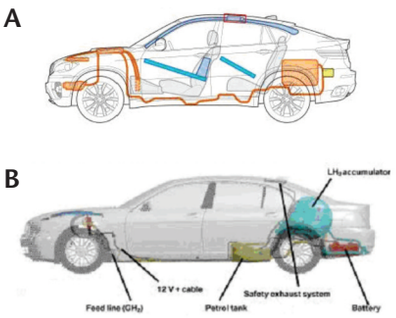

Figure 1. (A) Energy accumulator in the BMW X6. (B): auxiliary liquid hydrogen tank in the BMW Series 7 car.

Figure 2. Liquid petroleum gas (LPG) supply valve, in the fuel cap compartment.

Although we have no specific data on accidents involving these types of vehicle, or incidents involving rescue or EMS personnel, in the same way as update our knowledge of new treatments and clinical protocols, we should be aware of these advances to be able to continue providing safe, high-quality care.

References

1 BMW Service. MINI Service. Rescue Manual BMW MINI. Emergency services guidelines. Information for the emergency services. (Consultado 1 Julio 2011). Disponible en: https://oss.bmw.de/rettungsleitfaden/en_Rescue_Manual_BMW_Mini.pdf

2 TOYOTA SCION LEXUS. Technical Information System. Emergency Response and Hybrid Information. (Consultado 6 Junio 2011). Disponible en: https://techinfo.toyota.com

3 FORD Motorcraft. 2011 Escape/Mariner Hybrid Emergency Response Guide. (Consultado 6 de Junio 2011). Disponible en: http://www.motorcraftservice.com

4 American Honda Motor. Emergency Service Guideline for Hybrids vehicles. Guide prepared fire service, law enforcement, emergency medical and professional towing personnel. 2005. Reorder number Y0716.

5 Kerr K. Hybrid cars pose new threat to emergency personnel. Duncanbanner. (Consultado 8 Junio 2011). Disponible en: http://duncanbanner.com/local/x598335096/Hybrid-cars-pose-new-threat-to-emergency-personnel.

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