

## LETTERS TO THE EDITOR

## Why should be concerned about organ donation in the emergency department? The patient's right to become a donor

Sir,

The limitation of therapeutic effort (LTE), as part of end-of-life care, is sometimes indicated in emergency department (ED) patients with fatal brain damage<sup>1-3</sup>. In this context, the objectives are to ensure wellbeing measures, lack of pain, family support and to preserve the dignity of patient<sup>4</sup>.

But to provide care according to the wishes of the patient, we should also consider their will to become an organ transplant donor<sup>5-8</sup>. Thus, not only is their desire respected but but, secondarily, we can increase the number of organ donors.

Introducing this consideration in urgent care is fraught with difficulties: the desire to be a donor must be incorporated in the first decisions, consensus protocols ensuring reliability, transparency and safety are required, and finally training and the conviction of emergency physicians (EPs). To this end, in the last quarter of 2013, we evaluated the opinion and the attitude of our emergency physicians as a first step in designing an intervention plan that included discussion of ethical issues and training in donor pre-evaluation, contraindications and risk quantification of brain death (BD)<sup>9</sup>.

Finally, we adapted the protocol of end-of-life care in the ED and obtained support from the transplant coordinator. The following semester, assessed the implementation of the new consensus, the cases and the resulting number of organ donations.

Our ED is a hierarchical service with its own expert staff, part of a tertiary 530-bed hospital (42 critical care beds). In the period under review, 22 of the 25 hospital cases of BD were diagnosed in the ED; in 7 of the 22 cases, fatal BD was diagnosed in the first period: 2 arrived intubated and 5 were not. In these seven cases, the ED physician agreed on the application of LTE with at least one consultant, presented to the family the progn-

sis and alternatives and asked about advance directives, including organ donation.

All the families confirmed the will to donate; this implied the need to establish (or maintain) tracheal intubation and the donation protocol. All 7 died of fatal BD and 6 became organ donors. The new procedure increased the diagnosis of BD by 28% and the number of donors by 24%.

The aim of the EPs<sup>10</sup> was not to solicit donations, but to establish the patient's desire and initiate the necessary measures to make the donation possible. It may be unusual to consider organ donation in the context of LTE or prolonged cardiopulmonary resuscitation after cardiac arrest (uncontrolled asystole donation, DANC<sup>11, 12</sup>). But considering the possibility of organ donation in end-of-life care, after making every diagnostic and therapeutic effort, conforms to the principles of medical ethics governing the doctor-patient relationship (beneficence, maleficence) and organ donation (dead donor rule)<sup>7</sup> and protects the patient's right to be a donor<sup>2,4,6,10</sup>.

Furthermore, this approach, in selected cases, is the only opportunity to satisfy the will of the patient in this regard. Pre-hospital emergency medical services and EDs have played an important role in DANC. Thus, in patients with fatal brain damage and LTE, the emergency physician should know and take into account the patient's wishes regarding organ donation, whenever possible.

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Mireia PUIG,  
Francisco CABALLERO,  
Josep RIS,  
Jesús LEAL

*Servicio de Urgencias y Coordinación de Trasplante, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain.*

## Triaje and urgenciólogo: two words knocking at the doors of the Spanish Royal Academy

I cannot miss the magnificent opportunity offered me by the two reputed authors of articles published in the latest issue of EMERGENCIAS<sup>1,2</sup> to ask your opinion about the two words *triaje* and *urgenciólogo* (triage and emergency physician), whose use has long been established in Spanish. And not only by health professionals working in the field of Accident and Emergency Medicine (EM) but also by other professional colleagues and even by

many non-medical members of the general Spanish population. These words are currently absent from the dictionary of the Royal Spanish Academy (RAE). However, they are regularly used in the journal *Emergencias*, specialized in the field of EM, albeit italicized, as evidenced by multiple recently published titles and relevant articles<sup>3-10</sup>.

Alternatives for *triaje* may be found in Spanish (in fact it is mentioned in the Royal National Academy of Medicine dictionary as a synonym for prioritization<sup>11</sup>), but these alternatives will not replace the widespread use of *triaje* since it was first introduced to designate "classification of ill or injured people according to severity of injuries or condition, in order to prioritize their attention with the care resources available" by Dr. Larrey in France during the Napoleonic wars, which probably has its Latin roots in another word *striare* meaning "separated by a groove."<sup>12</sup> This term and this meaning has been recognized in Catalan, English and possibly in many other languages unknown to the editor, as words borrowed from French.

Regarding the word *urgenciólogo*, the lack of recognition of the specialty of emergency medicine in Spain has possibly impeded its official recognition, despite the fact that a growing number of physicians devote all their working life to the practice of this specialty. Obviously, many are specialists of other medical disciplines<sup>13</sup>, but cannot use the word *urgenciólogo* to denominate their true professional role. In Spanish, *médico de urgencias y emergencias* could be an option, but the reality is that the word *urgenciólogo* has already been established in Spain. While recognizing that the word is of hybrid origin whose composition involves two lexemes from different languages (Latin *urgentia*, meaning "imperative need" and Greek *-λογία* – which means "dedicated to")<sup>14,15</sup>, denoting that it was created by a group with little linguistic competence, it is now part of the usual vocabulary used in and outside the field of medicine. The word *emergenciólogo* is also used in many Spanish-speaking countries, possibly favored by contamination from the English term (emergency physician) and the hybrid term is also traceable to the

Latin word *emergens*<sup>14</sup>, but this term appears to be no better than *urgenciólogo*.

In any case, leaving aside these and other linguistic technicalities, it seems to me that both words should be evaluated for inclusion in future editions of the RAE dictionary on grounds of general use, without prejudice to other alternatives that may be currently available.

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Óscar Miró

Editor, *EMERGENCIAS*, Spain.

## Author's reply

Sir,

In response to your letter concerning the terms **triaje and urgenciólogo** (triage and emergency physician), I first wish to express my thanks for raising this terminological debate; analysis and reflection on the proper use of medical terms is always necessary and it is enriching to have a framework to present our studies and reflections on these issues.

The term triage is already included in our Dictionary of Medical Terms (DTM) as a synonym for prioritization<sup>1</sup>, correct and established in the medical field. Italics are not recommended since it is not an English term, as its spelling and pronunciation are fully adapted to Castilian Spanish.

In the case of **urgenciólogo**, whose use is indeed recent, the term is not currently included in the DTM, although it is under study for inclusion in the terminology database of the Royal Academy of Medicine (ANPR), along with its equivalent emergency physician. The terms **emergenciólogo** and **emergencista** have also been documented but rejected because they considered to be excessively based on the English equivalent. Regarding this term, please see "**urgencia**"<sup>1</sup> in the DTM.

**Obs.:** Due to the influence of the English term emergency, in Spanish we increasingly see the anglicized "emergency" used in the sense of "urgency" which has met with strong opposition among some doctors. Also due to the influence of English, we have begun to see a distinction between "urgencia" in the sense of "mild urgency" and "emergencia" in the sense of "vital emergency".

This is, in short, the information gathered by the RANM Unit of Medical Terminology regarding these terms and it is beyond our scope to

judge their inclusion in the dictionary of the Royal Spanish Academy, as that is a dictionary of general use and does not include the entire lexicon of the specialty, and the RAE will decide on the criteria for inclusion or not of such technical terms.

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Joaquín POCH BROTO

Presidente de la Real Academia Nacional de Medicina, Spain.

## Author's reply

Sir,

Indeed, the term triaje is not recorded in the dictionary of the Royal Spanish Academy (DRAE), twenty-third edition (2014), with a specifically medical meaning (it is listed as "action and effect of triar", where "triar" is "choose, separate," and the dictionary provides various non-medical examples of use. It is true, however, that existing documentation at this time in the databases of the Academy would allow its inclusion - regardless of its medical meaning related to the first meaning of "triar" - as it is well documented in the corpus. In the Reference Corpus of Current Spanish (CREA, made up of a wide variety of written and oral texts produced in all Spanish-speaking countries from 1975-2004), 9 cases appear in one document: "Triaje is a process of preliminary clinical evaluation that classifies patients by urgent need to be subject to complete diagnostic and therapeutic evaluation in these emergency services.

*Triaje* assesses symptoms and signs and the presence of a structured triage system is an indicator of quality in risk-efficiency that protects the most serious patients, optimizes resources, decongests the ED and improves patient care in these departments" (*Diario Málaga-Costa del Sol*, 22/01/2004).). In the Corpus of Spanish in XXI (CORPES, texts composed between 2001 and 2012) 68

instances were published in 25 papers (first documented in 2004); for example: "The material for care of victims includes a classification or triage station,....." P. Arcos González, *La ayuda sanitaria en desastres* (Fundación Carlos III, Madrid 2006)). Furthermore, the dictionary of medical terms (DTM) of the Royal Academy of Medicine and dictionaries of other languages (Oxford Dictionary -OED- Inglés and *Lo Zingarelli* already included it). It is hoped, therefore, that it will soon be included in DRAE.

Regarding *urgenciólogo* (emergency physician) at the moment there is less documentation. In the CREA, 2 cases occur in 1 document (and quotes): "Any of us who have spent some time practicing as an '*urgenciólogo*', has ample experience to build a volume of short stories ....." (Jimenez de Diego, L. (2002): *Memoirs of an emergency physicians*). In CORPES, there are 3 cases in 6 documents. However, this term is not recorded in the dictionaries mentioned above (DTM, OED, *Lo Zingarelli*). The hybrid origin of the term would not be an obstacle for inclusion as there are words in Spanish that have this double morphological origin (criminología, glaciología, herbología), but rather the lack of documented use at this time..

José Manuel SÁNCHEZ RON

Académico, Real Academia Española, Spain.

## Ventricular fibrillation in the presentation of Takotsubo cardiomyopathy

Sir,

Takotsubo syndrome was first described by Sato et al. in Japan in 1990. Since then the number of reported cases has increased due to widespread echocardiography and coronary angiography. Also, new variants have been described according to the affected segment<sup>1,2</sup>.

A 69 year-old woman with hypertension was admitted for elective hip fracture repair. Analgesic perfusion for pain began. Within 24 hours of admission, before surgery, she presented dyspnea, hypertension and ventricular fibrillation which subsequently reverted to sinus rhythm after shock therapy at 200 J. Urgent coronary angiography revealed no significant lesions. Ventriculography showed left ventricular dilation, akinesia of the anterolateral, apical and inferior seg-

ments with basal hyperkinesis and depressed systolic function. The findings were confirmed by echocardiography. The patient had elevated biomarkers of myocardial injury (troponin T: 383 ng / L, average: 0-14 ng / L) while other laboratory parameters were normal. An electrophysiological study was performed without arrhythmia induction. At discharge she was prescribed treatment with beta-blockers and angiotensin-converting enzyme inhibitors (ACEI).

Takotsubo syndrome is an acute cardiomyopathy precipitated by a stressful situation that mimics acute coronary syndrome. It is characterized by electrocardiographic changes compatible with ischemia, minimum elevation of markers of myocardial damage with impaired contractility with apical dyskinesia on ventriculography and coronary arteries without injury<sup>3,4</sup>. In a series of 60 patients newly published by Nogales-Asensio et al. the authors highlight the high incidence of heart failure (40%) and cardiogenic shock (18%) and the fact that dyspnea was the most prevalent symptom<sup>1,4</sup>. Ventricular arrhythmia may be the start in 9% of cases<sup>5</sup>.

Most (90%) cases occur in postmenopausal women in relation to emotional stress while in men a physical trigger is predominant<sup>2,7</sup>. The most plausible etiological hypothesis is based on myocardial toxicity by elevated circulating catecholamines<sup>2,8</sup>. Segmental contractility changes are explained by a greater number of betadrenergic receptors in the cardiac apex<sup>2</sup>.

The prognosis is generally favorable, with recovery of ventricular function, and low hospital mortality of 3.3% (8.3% in those who develop heart failure<sup>1,6,8</sup>). The treatment is that employed in systolic dysfunction: ACE inhibitors, beta blockers and diuretics<sup>5</sup>. Antiplatelet therapy with aspirin is also used<sup>8</sup>. In conclusion, we describe a case of Takotsubo syndrome debuting as ventricular fibrillation. The condition was attributed to pain and the stress of hospitalization.

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José GÓMEZ RUBIO<sup>1</sup>,  
Ana Belén BÁRCENA ATALAYA<sup>2</sup>

<sup>1</sup>Servicio de Medicina Interna, <sup>2</sup>Servicio de Cuidados Críticos y Urgencias, Hospital Universitario de Valme, Sevilla, España.

## Angioedema caused by use: a rare complication in the emergency department

Sir,

In the last decade there has been a progressive increase in cocaine use, and consequently, increased demand for care in the emergency department for complications related to such use. This drug can be administered by various routes, and the most common is intranasal.

A 45 year-old male sporadic consumer of alcohol and inhaled cocaine visited the ED for a sensation of a foreign body sensation in the oral cavity during 4 hours, without dyspnea, sore throat or laryngeal stridor. He reported using cocaine 24 hours before the onset of these symptoms. He reported no previous food intake and no known drug allergies. Upon arrival, he was hemodynamically stable but with psychomotor, eupneic agitation, oxygen saturation of 97% and in the oral cavity an edematous uvula (1.5 cm diameter) was observed without erythema or exudate (Figure 1). The rest of the examination was normal. Complementary tests showed no significant alterations, except positive blood ethanol (0.3 g / L) and cocaine in urine (> 900 ng / mL). With the clinical suspicion that it was angioedema secondary to cocaine or excipients, he was administered antihistamines (dexchlorfeniramine 5 mg) and intravenous corticosteroids (methylprednisolone 40 mg). He required intramuscular adrenaline after 30 minutes due to sudden onset respira-



**Figure 1.** Angioedema of the uvula.

tory difficulty, without further incidents. The patient improved after 6 hours of arrival and was discharged after 24 hours under observation.

Since the most common cause of angioedema includes type II hypersensitivity reactions and a history of cocaine use, it was suspected that the patient had an allergic reaction secondary to cocaine use or any of its multiple chemical and / or pollutant excipients, although the effects may only appear 24 hours after consumption, since the allergic reaction may originate from the early hours of consumption up to 48 hours later<sup>1-3</sup>. In this situation, it is essential for the emergency physician to ensure patency of the airway<sup>4</sup> by administering adrenaline and to perform patient monitoring. The use of adrenaline is controversial in the literature reviewed, as it was administered only in one case<sup>3</sup>, because it is a sympathomimetic drug that can worsen the clinical symptoms reported.

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Julia MEZQUIDA ARNÓ<sup>1</sup>,  
Teresa ESCOLAR MARTÍNEZ-BERGANZA<sup>2</sup>,  
María del Carmen LAHOZA PÉREZ<sup>1</sup>

<sup>1</sup>Medicina Familiar y Comunitaria del Área 3 de Zaragoza, España. <sup>2</sup>Servicio de Urgencias, Hospital Clínico Universitario Lozano Blesa, Zaragoza, Spain.

## Levamisole: a dangerous cocaine additive widely used in Spain

Sir,

Levamisole is an antiparasitic drug marketed from 1966, which in most Western countries was banned for human use from the 1980s because of the risk of agranulocytosis and necrotizing vasculitis, although it is authorized for veterinary use, primarily as a nematicide<sup>1</sup>. From 2008 cocaine adulterated with this chemical was detected, probably due to its organoleptic characteristics which are similar to those of cocaine, coupled with its low cost and availability for veterinary use, in addition to its psychostimulant properties. In the USA, up to 80% of cocaine seized contained levamisole<sup>2</sup>. In Spain we have found only three reported cases of adverse reaction to cocaine / levamisole detected in hospital departments of dermatology, nephrology and internal medicine<sup>3-5</sup>, so it seemed to us important to present this series of patients seen in the emergency department.

In a period of 15 months (May 2013-July 2014) we treated in the emergency department of our hospital 6 patients with acute adverse reaction after consuming, among other substances, cocaine adulterated with levamisole. Identification of cocaine or its metabolites and / or levamisole is by gas chromatography coupled to a mass spectrometer. The characteristics of these patients are shown in Table 1.

In the first case we would highlight the occurrence of painful purple retiform skin lesions with areas of necrosis in the center (Figure 1) and located on the abdomen, arms and thighs. Skin biopsy showed small vessel vasculitis with thrombotic phenomena. This was accompanied by leukopenia ( $3.4 \times 10^9 / L$  total leukocytes with  $1.1 \times 10^9 / L$  neutrophils). The exact mechanism of these effects is unknown, but most authors agree on an immune hypothesis as suggested by the presence of positive anti-



**Figure 1.** Purple retiform skin lesions with central necrosis, located in the abdomen of case 1. Skin biopsy showed small vessel vasculitis.

elastase antibodies (ANCA) found in the case presented and others in the literature, as well as the detection of other antibodies (phospholipid, cardiolipin, anticoagulants and others)<sup>6</sup>. The same hypothesis would explain the retiform purple characteristics, due to thrombosing vasculitis, which may lead to tissue ischemia and even the risk of limb amputation.

Cases 2, 3 and 4 presented clinical events (coma, agitation) which may be explained by the combination of cocaine and other drugs (MDMA or ecstasy, GHB or liquid ecstasy, ethyl alcohol), and is not likely that levamisole played a significant role here but it is known that this substance is deliberately added to cocaine to enhance its euphoric effects and thus may have contributed to the agitation.

In cases 5 and 6 we would highlight the presentation of asystole; in one of them, there was no recovery. It is true that cocaine, per se, has been described as a cause of sudden death and, in the latter case presented, heroin and its metabolites were also detected. Therefore, these drugs alone could explain the asystole. But experimentally, it is known that levamisole is arrhythmogenic<sup>7</sup> and has sympathomimetic effects similar to cocaine or amphetamines. Therefore, le-

vamisole could have been enhanced the cardio-toxicity of cocaine.

Cases of drug abuse are on the rise in the ED<sup>8,9</sup>, but changes in the qualitative and quantitative composition of these substances represents an added challenge to clinicians caring for these patients and laboratories trying to identify them to improve the quality of care<sup>10,11</sup>.

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Santiago NOGUÉ XARAU<sup>1</sup>,  
Jordi TO-FIGUERAS<sup>2</sup>,  
Gregori CASALS<sup>2</sup>,  
José MANUEL MASCARÓ<sup>3</sup>

<sup>1</sup>Sección de Toxicología Clínica, Área de Urgencias,  
<sup>2</sup>Laboratorio de Toxicología, <sup>3</sup>Servicio de  
Dermatología, Hospital Clínic, Barcelona, España.

## Severe sepsis in a man with colonized elephantiasis nostra verrucosa

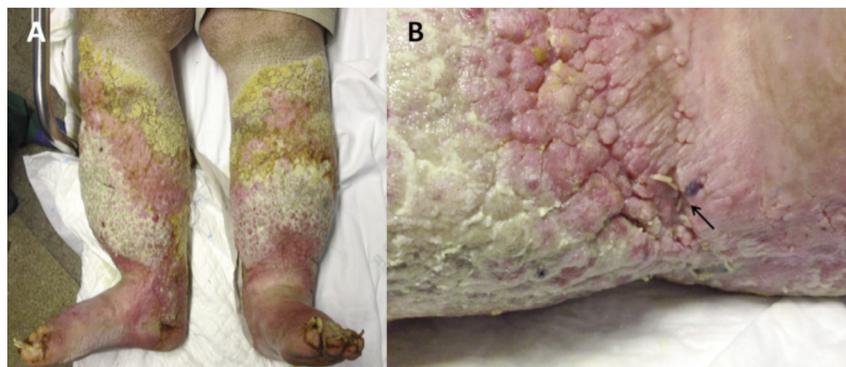
Sir,

The presence of predisposing factors such as obesity, diabetes mellitus, disabilities, alcoholism, poor hygiene and self-care and / or associated psychiatric conditions means that *verrucosa elephantiasis nostra* (EVN) constitutes the ideal breeding ground for superinfection and skin parasitism<sup>1</sup>, implying very unfavorable prognosis in these patients. We report the case of a patient treated in the emergency department who presented serious sepsis with superinfected and colonized skin lesions on both legs, compatible with a diagnosis of EVN.

**Table 1.** Epidemiological, clinical and toxicological characteristics and outcomes of patients treated in emergency departments after cocaine / levamisole use

Case	Sex	Age (years)	Reason for consultation	Co-ingestion of other drugs*	Leukopenia (<4.5 10 <sup>9</sup> /L)	Other notable clinical measures	Main therapeutic measures	Outcome
1	M	36	Purple retiform	Cannabis	YES	NO	Symptomatic	Recovery
2	M	33	Coma	GHB	NO	NO	Intubation and mechanical ventilation.	Recovery
3	M	34	Agitation	GHB, poppers	NO	NO	Sedation with benzodiazepines. Mechanical restraint.	Recovery
4	M	26	Agitation	Ethanol (2.83 g/L), MDMA	NO	NO	Symptomatic measures.	Recovery
5	M	32	Decreased consciousness	Ethanol (1.38 g/L), GHB, poppers	NO	Asystole recovered	Sedation with benzodiazepines. Symptomatic measures.	Recovery
6	M	41	Cardiorespirator y arrest	Ethanol (1.35 g/L), MDMA, heroin	NO	Asystole unrecovered ed	External cardiac massage. Atropine. Symptomatic measures CPR.	Death

\*Detected or reported. M = male; GHB = gamma-hydroxybutyrate (liquid ecstasy); MDMA = methylene-dioximetanfetamina (ecstasy); Poppers = drug of abuse usually composed of amyl nitrite or isobutyl.



**Figure 1.** Bilateral increase of lower limb perimeters and associated deformity secondary to chronic lymphedema, with warty lesions and signs of superinfection and colonization. B) Detail showing characteristic lesions and multiple colonization by house fly larvae (arrow).

A 51 year-old man visited the emergency department for significant deterioration of general condition during a few hours. Previous history included important alcoholism, ischemic heart disease and metabolic syndrome without medical supervision, in the context of poor personal hygiene and extreme self-neglect. On arrival the patient presented poor general condition and hemodynamic instability (hypotension, tachycardia and signs of distal hypo-perfusion). The anamnesis was very difficult, and he only reported excruciating pain in both legs. After removal of self-prepared malodorous bandages, we observed increased perimeter of both lower extremities associated with significant deformity (Figure 1A) and many warty lesions, nodules and papules with abundant greenish exudate and intense larval colonization (Figure 1B). Samples for microbiological and parasitic study were taken, and the patient received resuscitative measures, broad-spectrum intravenous antibiotics and urgent admission to the critical care unit. Despite a favorable initial response, the patient died after 48 hours. The culture was positive for *Pseudomonas aeruginosa*, and the larvae were housefly.

EVN is a rare entity in our setting that arises from chronic obstructive lymphedema, of multiple etiology (congenital, infectious, neoplastic etc.), characterized by severe deformity and cutaneous features such as dermal fibrosis, verrucous lesions and papillomatosis<sup>2</sup>. Diagnosis at an early stage allows treating the cause of lymphatic obstruction, and measures to prevent superinfection of skin lesions should be administered<sup>3</sup>. In an unfavorable socio-cultural context, the lack of personal and hygienic care is a predisposing factor for superinfection of such injury, with very poor prognosis in some cases. Preventive measures are vital in these patients, as is very thorough hygiene or even the use of insect repellent<sup>4</sup>.

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José Aurelio NAVAS CUÉLLAR,  
Julio REGUERA ROSAL,  
Verónica PINO DÍAZ  
Javier PADILLO RUIZ

*Unidad de Gestión Clínica de Cirugía General,  
Hospital Universitario Virgen del Rocío, Sevilla,  
Spain.*

## Austrian syndrome in and infant with pneumococcal septic shock

Sir,

Pneumococcal endocarditis is a rare complication (incidence 0.4%) of pneumococcal bacteremia in children<sup>1,2</sup>. The association of pneumonia, meningitis and pneumococcal endocarditis is known as Austrian<sup>3</sup> syndrome. In this picture, endocarditis is caused by hematogenous spread from a primary pneumonic focus and preferentially affects the aortic valve<sup>3,4</sup>. Meningitis is secondary to septic emboli. Its importance lies in being an infection with high mortality (50%), unless early diagnosis and treatment are performed<sup>4</sup>.

This case involved a 4-month old infant, operated at 7 days for type B aortic arch interruption and ostium secundum atrial septal defect. The visit was occasioned by catarrh of 4 days duration, associated with high fever (39°C) during two days, and recurrent vomiting and drowsiness in the past 12 hours. Physical examination revealed hypotension (50/30 mmHg), poor peripheral perfusion, tachypnea and costal retractions, crackles at the base of the left lung, a stuporous state of consciousness and bulging anterior fontanelle. Laboratory tests showed leukopenia, PCR of 187 mg / L and coagulopathy. Chest radiography showed condensation in the left lower lobe. Cerebrospinal fluid (CSF) was purulent with 190 cells (90% PMN), proteins 182.1 mg / dl and glucose 5 mg / dl. Computed tomography (CT) scan was normal. Given the hemodynamic instability, echocardiography was performed, revealing an 8 x 4 mm wart in the atrial septum (Figure 1). *Streptococcus pneumoniae* was isolated in blood and CSF samples. Treatment was started with cefotaxime, gentamicin and vancomycin, mechanical ventilation, dopamine, crystalloid and plasma. No surgery was performed given the presence of coagulopathy and hemodynamic instability secondary to sepsis. The patient evolved favorably with complete resolution in nine days without sequelae. He then completed 6 weeks of intravenous antibiotic therapy.

In pneumococcal endocarditis early diagnosis is critical. Therefore, echocardiography was performed for active search in patients with pneumococcal pneumonia associated with hemodynamic instability or other signs suggesting endocarditis (emerging murmur, etc.) as well as in patients with pneumococcal<sup>4</sup> pneumonia and meningitis. Although cases have been reported in patients wi-



**Figure 1.** Subcostal longitudinal plane echocardiography showing a triangular mass in the mid-zone of the inter-atrial septum (arrow) at the level of the surgical suture, which protrudes towards the right atrium.

thout underlying heart disease, echocardiography is indicated especially in patients with structural heart disease<sup>2</sup>, focusing the study on cavities and left ventricular valves or implanted prosthetic material, as in our case. Antibiotic therapy was administered early and combined with third-generation cephalosporin, glycopeptide and an aminoglycoside (completed 4-6 weeks of intravenous treatment)<sup>5</sup>. Surgery is reserved for cases where medical treatment alone appears unlikely to be effective<sup>5,6</sup>.

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Moisés RODRÍGUEZ-GONZÁLEZ,  
Miguel Ángel MATAMALA-MORILLO  
Sección de Cardiología Pediátrica, Pediatría,  
Hospital Universitario Puerta del Mar,  
Cádiz, Spain.

## Ethylene glycol poisoning after ingestion of the contents of a fire extinguisher

Sir,

Ethylene glycol poisoning is common in our setting. This alcohol, odorless and colorless, is present in many industrial and household products. Poisonings have been reported as a substitute intake of ethyl alcohol and, exceptionally, suicidal

intention<sup>1</sup>.

A 25 year-old man with unremarkable medical history was brought to the emergency department 30 minutes after an altercation in the street, where he voluntarily swallowed the contents of a fire extinguisher. Upon arrival, he was hemodynamically stable, afebrile, with incoherent and disorganized speech. The rest of the physical examination was normal. Arterial blood gases showed metabolic acidosis with increased anion gap (pH 7.08, bicarbonate 8 mEq / l, pCO<sub>2</sub> 27 mmHg, anion gap 37 mEq / l). Other causes of metabolic acidosis were ruled out (negative ketonuria and etanolemia, lactic acid was normal and there was mild acute renal failure), and the osmolar gap was calculated: 21.08 mOsm / L (normal <10 mOsm / l).

The Poison Information Centre confirmed that the fire extinguisher involved contained ethylene glycol. Although blood levels of ethylene glycol were not determined, due to interference of renal replacement therapy, the final diagnosis was secondary metabolic acidosis due to ingestion of ethylene glycol. In the ED, gastric lavage was performed with activated carbon, and because of the severity of metabolic acidosis urgent hemodialysis was performed. The session was uneventful and at first control pH was 7.3, HCO<sub>3</sub> 17 mEq / l, anion gap 17 mEq / l, osmolar gap 12 mOsmol / l. At no time did he present respiratory or visual disturbances. The patient was discharged after seven days with a diagnosis of acute psychotic episode.

Early diagnosis and treatment of ethylene glycol poisoning are essential for short and long term prognosis. Ingestion can cause metabolic acidosis, renal failure, retinal toxicity and brain damage. Besides treatment with intravenous bicarbonate and alcohol dehydrogenase inhibitors, hemodialysis is the best method for the rapid removal of both ethylene glycol and its metabolites. It is indicated in metabolic acidosis with anion gap > 30 meq / l and osmolar gap > 20 mosmol / l, as in our case<sup>2,3</sup>. Early treatment is crucial to avoid the high lethality of untreated or chronic effects in survivors<sup>4</sup>, so it should be started without confirming the values of ethylene glycol in blood<sup>5</sup>. Although there have been cases in the literature of poisoning related to inhalation of the contents of fire extinguishers<sup>6</sup>, poisoning by ingestion has not been previously described.

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Isabel GALÁN CARRILLO<sup>1</sup>,  
Pablo DEMELO-RDRÍGUEZ<sup>2</sup>,  
Juan Carlos CANO BALLESTEROS<sup>2</sup>,  
Úrsula VERDALLES GUZMÁN<sup>1</sup>

<sup>1</sup>Servicio de Nefrología, <sup>2</sup>Servicio de Medicina Interna, Hospital General Universitario Gregorio Marañón, Madrid, Spain.

## Subcutaneous emphysema in a boy with multiple injuries: tracheal rupture

Sir,

Tracheal rupture is a rare injury, especially in children. It happens after high-energy trauma, and can cause death *in situ*<sup>1-4</sup>.

This case was a 6 year-old boy crushed by a metal door with direct trauma of the head and chest. Upon ED arrival about 20 minutes later, Glasgow Coma Scale score was 15, and he showed epistaxis, otorrhagia, dental avulsion injuries and discrete frontoparietal subcutaneous emphysema. After endotracheal intubation, mechanical ventilation was started



**Figure 1.** Chest CT scan showing the presence of bilateral pneumothorax and subcutaneous emphysema with chest drainage tubes. Deviation of the endotracheal tube relative to the tracheal route towards the posterior mediastinum.

with positive pressure. At that time increased subcutaneous emphysema was observed. Computed tomography (CT) scan showed a massive bilateral pneumothorax, so two chest tubes were placed in continuous aspiration. Control CT showed better lung expansion, and the endotracheal tube (ETT) in infracarinal position in the posterior mediastinum (Figure 1). With the suspicion of tracheal rupture, he was transferred to a referral hospital, where 3-dimensional CT and bronchoscopy confirmed a membranous tracheal rupture with ETT located distally in the posterior mediastinum. The ETT above the lesion was withdrawn, and the lesion closed spontaneously. Currently the patient is asymptomatic.

The clinical manifestations of tracheobronchial injury depend on the location and severity<sup>5</sup>; chest pain and dyspnea are common symptoms, while subcutaneous emphysema and pneumothorax indicate an air leak<sup>2,4-6</sup>. The presence of cervical pain, dysphagia, hemoptysis or dysphonia may also be indicative of tracheal injury<sup>7</sup>. It is recommended to keep the patient on spontaneous ventilation until locating the lesion by laryngos-

copy / bronchoscopy. Intubation should be guided by bronchoscopy, and the end of the ETT must be distal to the lesion<sup>3,8</sup>. In this case, on moving the ETT, it was introduced into the mediastinal area, so it was removed, and the distal end was located proximal to the lesion. We consider the case relevant for the peculiarity of the injury and its severity. The presence of subcutaneous emphysema should alert us to the possibility of tracheobronchial injury and it is recommended that it should be guided by fiberoptic intubation after locating the lesion. In our case, tracheal injury was probably caused by the accident as subcutaneous emphysema was observed before intubation. Endotracheal intubation without bronchoscopy could in fact worsen the injury.

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Isabel SAN MARTÍN GARCÍA<sup>1</sup>,  
Nuria CLERIGUÉ ARRIETA<sup>1</sup>,  
Jorge RODRÍGUEZ OZCOIDI<sup>1</sup>,  
Laura MORENO GALARRAGA<sup>2</sup>

<sup>1</sup>Unidad de Cuidados Intensivos Pediátricos, Servicio de Pediatría. <sup>2</sup>Unidad de Neumología Infantil, Servicio de Pediatría, Complejo Hospitalario de Navarra B, Pamplona, Spain.