

LETTERS TO THE EDITOR

Usefulness of emergency ultrasound in a patient with a swollen knee

Utilidad de la ecografía en urgencias ante un paciente con tumefacción de la rodilla

Sir,

Emergency ultrasound performed and interpreted by emergency physicians (EPs) is increasingly accepted and now used in routine clinical practice¹. Bursitis is a common cause of musculoskeletal pain and therefore a common reason for ED visits². The infrapatellar bursa can be superficial or deep. The former is located between the tibial tubercle and the overlying skin, whereas the deep is located between the patellar tendon and the anterior superior tuberosity of the tibia³. Inflammation of the superficial bursa is related to bipedestation and is attributed to repetitive friction. Inflammation of the deep bursa is less common. Treatment consists of anti-inflammatory agents and rest, and steroid or anesthetic infiltration may be performed.

A 44 year-old man with unremarkable medical history was attended for pain and swelling in his right knee since some days before, showing no improvement despite ibuprofen treatment. The knee was anteriorly swollen, with local inflammatory signs and painful limitation of flexion and extension. Ultrasound showed one anechogenic image with well-defined edges, teardrop-shaped, below the patellar tendon (Figure 1), consistent with deep infrapatellar bursitis. Ultrasound-guided evacuation was performed with lateral access to the patellar tendon; followed by infiltration with corticosteroids and local anesthetic. The patient showed rapid improvement of his symptoms. Joint fluid analysis showed no crystals or germs, and cell count was normal.

In this case, ultrasound was an essential tool for early diagnosis and treatment. The inclusion of ultrasound in emergency services allows reducing diagnostic error⁴ and overall attention time⁵; in addition, it also improves EP effectiveness⁶ and facilitates the early diagnosis of some conditions, including musculoskeletal disorders⁷. It would therefore be desirable to establish training programs⁸ with degrees of skill,

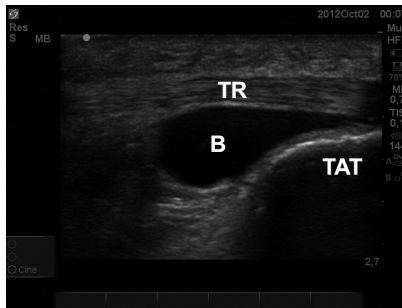


Figure 1. Ultrasound showing a teardrop shaped echogenic image (black), corresponding to the deep infrapatellar bursa (B), and the patellar tendon (TR) and the anterior tibial tuberosity (TAT), in a longitudinal slice of the knee.

following quality criteria, to ensure the safety and effectiveness of ultrasound performed by EPs.

Margarita Algaba-Montes,
Alberto Ángel Oviedo-García

Unidad de Gestión Clínica de Cuidados Críticos y Urgencias. Hospital Universitario de Valme. Sevilla, Spain.

margalgaba@hotmail.com

Conflict of interest

The authors declare no conflict of interest.

References

- 1 Noble VE, Brown DF. Renal ultrasound. *Emerg Med Clin North Am.* 2004;22:641-59.
- 2 Aaron DL, Patel A, Kaviaros S, Calfee R. Four common types of bursitis: diagnosis and management. *J Am Acad Orthop Surg.* 2011;19:359-67.
- 3 Saavedra MA, Navarro-Zarza JE, Villaseñor-Ovies P, Canoso JJ, Vargas A, Chiapas-Gasca K, et al. Clinical Anatomy of the Knee. *Reumatol Clin.* 2012;8(S2):39-45.
- 4 UchéBlackstock MD, Michael B. Stone MD. Emergency ultrasound and error reduction. *Ann Emerg Med.* 2009;54:53-5.
- 5 Durham B. Emergency Medicine Physicians Saving Time With Ultrasound. *Am J Emerg Med.* 1996;14:309-13.
- 6 Durston W, Carl ML, Guerra W. Patient satisfaction and diagnostic accuracy with ultrasound by emergency physicians. *Am J Emerg Med.* 1999;17:642-6.
- 7 Oviedo-García A, Algaba-Montes M, Jaloud-Saavedra E, Fernández-Valverde G. Pericarditis lúpica: a propósito de un caso. *SEMERGEN.* 2009;35:341-4.
- 8 Nogué Bou R. La ecografía en medicina de urgencias: una herramienta al alcance de los *urgenciólogos.* *Emergencias.* 2008;20:75-7.

Comment on the PROTESU study

Comentarios acerca del estudio PROTESU

Sir,

I wish to comment on the article by Jiménez Hernandez et al. on thromboprophylaxis in patients admitted for medical reasons from emergency departments, in the context of the multicenter PROTESU study¹ about the application, under real conditions, of the recommendations of the PRETEMED guidelines. I agree with the authors on the need to improve our performance in these patients.

However, I would make a clarification regarding the results obtained by regression logistic analysis. After applying this test, they show a series of independent variables associated with the non-introduction of treatment in patients at moderate-high risk of thromboembolic disease (VTE) and the associations with inadequate establishment of thromboprophylaxis in patients at low risk of VTE. All of them show the odds ratio (OR) and 95% confidence interval (CI). Among these variables are, in the group of non-thromboprophylaxis, urinary tract infection (OR 2.39, 95% CI 0.90 to 6.37), hematologic disease (OR 4.32, 95% CI 0.85 to 21.83) polypharmacy (OR 2.09, 95% CI 1.00 to 3.69) and ischemic stroke (OR 0.31, 95% CI 0.07 to 1.34; in this case associated with increased thromboprophylaxis). And, in the inadequate thromboprophylaxis group of low-risk patients, metabolic disease (OR 5.20, 95% CI 0.83 to 32.33) and heart failure on admission (OR 3.73, 95% CI 0.88 to 15.86).

Since the confidence interval is the range of values among which is the true magnitude of the effect (in this particular case the OR) with a pre-established degree of certainty (usually 95%), when that interval includes the value 1 one cannot conclude that the variable is independent, because this value indicates the absence of a relationship between exposure and effect. Perhaps this study with a larger sample could establish another confidence interval, but with the data presented, the above-mentioned variables should

not be considered independent factors in the multivariate analysis.

Francisco José Ruiz-Ruiz

Servicio de Urgencias, Hospital Clínico Universitario "Lozano Blesa", Zaragoza, Spain.
ruizruizfj@gmail.com

Conflict of interest

The author declare no conflict of interest.

References

- 1 Jiménez Hernández S, Ruiz-Artacho PC, Merlo Loranca M, Carrizosa Bach MM, Aguillo García A, Antolín Santaliestra A, et al. Adecuación de la tromboprolifaxis en pacientes que ingresan por patología médica desde los servicios de urgencias hospitalarios: estudio PROTESU. *Emergencias*. 2014;26:281-91.

Author's reply

Respuesta de los autores

Sir,

Referring to comments by Dr. Ruiz-Ruiz, we would like to offer a number of clarifications to the questions formulated by the author regarding our work¹. A logistic regression model can be constructed differently depending on the study objectives, leading in turn to different ways of interpreting the results obtained². The two basic models are the explanatory and the predictive. In the first, logistic regression is used as a tool to assess the effect of exposure on a given response, controlling for confounders and incorporating the effect of modifier variables (interactions). In the second, it is used to select predictors and build a (parsimonious) model to describe, explain or predict the response of subjects and to assess the contribution of each of the predictor variables².

The predictive model therefore is not intended to evaluate a particular relationship, but to predict a certain response from values of a set of variables predictive of the response. There are several strategies to select the best predictive equation³. As in a previous study by our group⁴, one of the secondary endpoints of the PROTESU study was the evaluation of variables associated with inadequate thromboprophylaxis by constructing a predictive model with logistic regression. For that, we used the automatic backward step procedure and

subsequently we evaluated the predictive capacity using ROC curve analysis. Variables remaining in the model are those that help predict inadequate thromboprophylaxis and they cannot be removed from the model, since that would modify its predictive capacity and therefore, the ROC curve. However, since it is a predictive model, and not explanatory, and since the confidence intervals include the value 1, for those variables indicated by Ruiz-Ruiz we cannot say that they are independently and significantly associated with inadequate thromboprophylaxis, though indeed there was a clear trend towards association that would probably become evident with a greater sample size.

Pedro C. Ruiz Artacho¹,
Sònia Jiménez Hernández²

¹Servicio de Urgencias, Hospital Clínico San Carlos, IdISSC, Madrid, Spain. ²Área de Urgencias, Hospital Clínic, Barcelona, Spain.

sjimenez@clinic.ub.es

Conflict of interest

The authors declare no conflict of interest.

References

- 1 Jiménez Hernández S, Ruiz-Artacho PC, Merlo Loranca M, Carrizosa Bach MM, Aguillo García A, Antolín Santaliestra A, et al. Adecuación de la tromboprolifaxis en pacientes que ingresan por patología médica desde los servicios de urgencias hospitalarios: estudio PROTESU. *Emergencias*. 2014;26:281-91.
- 2 Mirò i Andreu O. Manual básico para el urgenciólogo investigador. Barcelona: Ergon; 2013.
- 3 Domenech JM, Navarro JB. Regresión logística binaria, multinomial, de Poisson y binomial negativa. 4ª ed. Barcelona: Signo; 2008.
- 4 Hosmer DW, Lemeshow S. Applied logistic regression. 2nd ed. Nueva York: John Wiley and Sons; 2000.
- 5 Jiménez S, Martínez S, Merlo M, Fernández JM, Ruiz F, García P. Tromboprolifaxis en los servicios de urgencias hospitalarios de pacientes con patología médica que no requieren ingreso: estudio URGENTV. *Emergencias*. 2012;24:19-27.

Poisoning by phosphate enema in a toddler

Intoxicación por enema de fosfato sódico en pediatría

Sir,

The retention of enemas with high sodium phosphate content can

cause massive absorption of these ions in the colon and induce severe electrolyte alterations¹. Pediatric use is not without of risk, including fatal cases, especially in patients with intestinal or renal disease, although they can also occur in healthy children with functional constipation given standard doses (3-5 ml/kg)^{1,2}.

We report the case of a previously healthy constipated 20 month-old child who, after receiving a sodium phosphate (5 ml/kg) enema, without complete evacuation later, presented a crisis of rigidity, ineffective breathing with cyanosis (SatO₂ 85%), poor peripheral perfusion (blood pressure 60/30 mmHg) and coma (Glasgow 7). Blood tests showed hyperphosphatemia (65.9 mg/dl), hypocalcemia (4.7 mg/dl), hypernatremia (154 mEq/L) and severe metabolic acidosis (pH 6.9, HCO₃ 7 mEq/L). The ECG showed prolonged QTc interval (550 ms). Given the sodium phosphate poisoning, he was treated with mechanical ventilator, hyperhydration 3,500 ml/m², hemodynamic support with dopamine and slow iv correction of the hypocalcemia (1 mg/kg/hour). The ionic abnormalities persisted so hemodiafiltration was started resulting in progressive correction of the calcemia and phosphoremia. The picture resolved completely in a week, and the infant was discharged without sequelae.

Toxicity hyperphosphoremia is secondary to hypocalcemia. It produces neurological symptoms (tetany, convulsions and coma) or cardiac symptoms (shock or ventricular arrhythmias)^{1,3}. Furthermore, it can lead to hypernatraemic dehydration and severe metabolic acidosis. When this appears, renal excretion of phosphorus should be promoted by hyperhydration and diuretics, although these may worsen the hypocalcemia⁴. One can associate aluminum hydroxide as an oral chelator, even in patients on NPO⁵. If there is no improvement or renal insufficiency exists, urgent dialysis is indicated². Correction of hypocalcemia should be performed with caution to avoid the formation of metastatic calcifications on increasing phosphorus-calcium product. It should be aggressive in cases with arrhythmia, heart failure, convulsions or coma⁴. Inotropic support is often ineffective, and improves hemodynamic status with calcium supply³. Whenever these enemas are administered, one should check for complete elimination in 10 minutes; if not, facilitate elimination with water or saline. This helps avoid massive

absorption of sodium and phosphorus⁶.

Sodium phosphate enemas are very common in the management of patients with constipation or fecal impaction, and in preparation for endoscopic procedures in both adult and pediatric patients. Their use is contraindicated in children under 2 years of age. But clinicians should know the risks involved and assess the risk-benefit of administration. There are also possibly safer alternatives, and one needs to know the specific management of associated complications for early treatment of toxicity.

Moisés Rodríguez-González,
Miguel Ángel Matamala-Morillo

Sección de Cardiología Pediátrica, UGC Pediatría.
Hospital Universitario Puerta del Mar, Cádiz, Spain.
moirogo@gmail.com

Conflict of interest

The authors declare no conflict of interest.

References

- Mendoza J, Legido J, Rubio S, Gisbert JP. Systematic review: the adverse effects of sodium phosphate enema. *Aliment Pharmacol Ther.* 2007;26:9-20.
- Ladenhauf HN, Stundner O, Spreitzhofer F, Deluggi S. Severe hyperphosphatemia after administration of sodium-phosphate containing laxatives in children: case series and systematic review of literature. *Pediatr Surg Int.* 2012;28:805-14.
- Tomar M, Radhakrishnan S, Shrivastava S. Myocardial dysfunction due to hypocalcemia. *Indian Pediatr.* 2010;47:781-3.
- Oñoro G, de Lama G, Pérez-Martínez A, González-Vicent M. Severe hyperphosphatemia and hypocalcemia after administration of a hypertonic sodium phosphate enema. *Med Intensiva.* 2014;38:263-4.
- Hutchison AJ. Oral phosphate binders. *Kidney Int.* 2009;75:906-14.
- Sharluyan A, Stanescu S, Pérez-Caballero Macarrón C. [Is it wise to continue using phosphate enemas?]. *An Pediatr (Barc).* 2014 Apr 11.

Instructing patients on how to alternate analgesics on discharge from the emergency department

La clave de las tres "a": alternar analgesia al alta

Sir,

Pain is a frequent reason for visits to the emergency department

(ED) (approximately 50%)¹, and analgesics are the most prescribed drugs in the discharge report². Poor pain control has important consequences for the patient, family and workplace; social relations suffer, it causes sleep disturbances and is related with the appearance of depression and anxiety³. Therefore, it is essential to provide the patient with accurate and complete information about analgesic therapy to be used after discharge. But most EDs have three characteristics which may hinder the process: 1) information overload received in a short time; 2) the speed with which the patient is discharged; 3) unavailability, in most cases, of a quiet place to provide such information. Although the analgesia plan may be simple to follow (a prescribed analgesic and, depending on the severity of pain, alternate with stronger painkillers), Do the patients really understand what the health professional wanted to tell them? Chronic multi-medicated patients are not in fact more prone to confusion and error in the use of analgesics. Our experience is that any patient not familiar with hospital jargon is susceptible to incorrect analgesia. Three examples are given to illustrate this.

Example 1: A 39 year-old man visited the ED with a diagnosis of renal colic. He was discharged with "Paracetamol 1 g/8 h and if more pain, alternate with metamizol 575 mg/8 h". The patient revisited the ED because of uncontrolled pain. It was found that the patient was taking a different analgesic every 8 hours, not every 4 hours.

Example 2: A 31 year-old man diagnosed with jaw pain was discharged with "paracetamol 1 g/8 h and, if more pain, metamizol 575 mg/8 h". The patient revisited the ED for uncontrolled pain. It was found that, when the pain was more intense, the patient discontinued paracetamol and began with metamizol.

Example 3: A woman aged 80 years was diagnosed with cervical pain. She was discharged with "dexketoprofen 25 mg/8 h and, if more pain, paracetamol 1 g/8 h, and if the pain did not subside, alternate with metamizol 575 mg/8 h. Would we all administer the treatment in the same way?⁴⁻⁶

In conclusion, it seems necessary to clarify the information patients receive about prescribed painkillers at discharge in order to avoid or minimize the consequences of inadequate pain management.

quate pain management.

Ana De Lorenzo-Pinto,
Raquel García-Sánchez,
Silvia Buendía Bravo,
María Sanjurjo-Sáez

Servicio de Farmacia, Hospital General
Universitario Gregorio Marañón, Madrid, Spain.
ana.lorenzo@salud.madrid.org

Conflict of interest

The authors declare no conflict of interest.

References

- Casal Codesido JR, Vázquez Lima MJ. Abordaje del dolor musculoesquelético en urgencias. *Emergencias.* 2012;24:59-65.
- Ruiz-López J, Calleja Hernández MA, Giménez Manzorro A, Sanjurjo Sáez M. Analysis of prescriptions given on discharge from the emergency department. Economic impact. *Farm Hosp.* 2009;33:104-10.
- Hanks-Bell M, Halvey K, Paice JA. Pain Assessment and Management in Aging Online J Issues Nurs. 2004;9:8.
- Engel KG, Buckley BA, Forth VE, McCarthy DM, Ellison EP, Schmidt MJ, et al. Patient understanding of emergency department discharge instructions: where are knowledge deficits greatest? *Acad Emerg Med.* 2012;19:E1035-44.
- Hoek AE, De Ridder MA, Bayliss A, Patka P, Rodod PP. Effective strategy for improving instructions for analgesic use in the emergency department. *Eur J Emerg Med.* 2013;20:210-3.
- Bloch SA, Bloch AJ. Using video discharge instructions as an adjunct to standard written instructions improved caregivers' understanding of their child's emergency department visit, plan and follow-up. A randomized controlled trial. *Pediatr Emerg Care.* 2013;29:699-704.

Compartment syndrome due to iodinated contrast medium

Síndrome compartimental por contraste yodado

Sir,

Infiltration of iodinated contrast medium with extravasation into soft tissues is considered a local adverse reaction to intravenous administration. Contrast extravasation is increasingly common due to increasing use of this type of radiological technique¹. Reactions are usually mild and only 0.3 to 3.6% of cases suffer more severe reactions causing tissue damage or even compartment syndrome².

A 78 year-old woman with a history of endometrial cancer without signs of recurrence, treated by surgery and radiotherapy, was undergoing routine monitoring, during which abdominal and pelvic CT scan was performed. Adverse reactions to contrast infusion had not been observed in previous radiological controls. During infusion of the contrast medium, extravasation occurred which was not considered important at the time, so the patient was discharged home. Twelve hours later she was re-admitted with severe pain and paresthesia in all fingers of the left hand, together with an erythematous lesion with blisters affecting the back of the left hand to the fingers and the dorsal forearm. After fasciotomy, the pain subsided and she recovered tactile sensitivity.

Iodinated contrast extravasation rarely induces moderate or severe adverse effects, which usually occur only when high volumes are infused. There is great variability in clinical presentation. Patients may complain of pain at the site of injection, with local edema, erythema and tenderness, which usually resolves within 24 h. It is important to note that the degree of injury immediately after infusion is unpredictable. The presence, however, of skin blisters, altered tissue perfusion, paresthesia, and pain that persists after 4 h suggests a more serious picture³. In most cases of contrast extravasation, the effects



Figure 1. Lesion at 12 hours after the infusion of contrast medium.

are mild and well tolerated, and resolve rapidly. When extravasation occurs in regions that are distal to the elbow and large blisters or tissue necrosis develop, it is necessary to consider surgery, since there is high probability of compartment syndrome⁵.

Among the measures to be taken at an early stage before complications arise, elevation of the affected limb is recommended, since this reduces the edema by decreasing hydrostatic pressure in capillaries, local cold application since cooling causes vasoconstriction and reduces inflammation, and close observation during 72 hours, considering surgical

treatment if serious injury is suspected⁶.

Juan Ignacio Ramos-Clemente Romero,
Julia Fernández Soto,
Dolores María Díaz Carrasco
*Servicio de urgencias. Hospital Infanta Elena.
Huelva, Spain.*
jramoscle@yahoo.es

Conflict of interest

The authors declare no conflict of interest.

References

- Hani Sbitany, Peter F. Koltz, Chester Mays, John A. Giroto, Howard N. Langstein. CT contrast extravasation in the upper extremity: strategies of management. *Int J Surg.* 2010;8:384-6.
- Schaverien MV, Evison D, McCulley SJ. Management of large volume CT contrast medium extravasation injury: technical refinement and literature review. *J Plast Reconstr Aesthet Surg.* 2008;61:562-5.
- Carolyn LW, Richard HC, James HE, Saroja A. Frequency, Management, and Outcome of Extravasation of Nonionic Iodinated Contrast Medium in 69 657 Intravenous Injections. *Radiology.* 2007;243:80-7.
- Gault DT. Extravasation injuries. *Br J Plast Surg.* 1993;46:91-6.
- Bellin MF, Jakobsen JA, Tomassin M. Contrast medium extravasation injury: guidelines for prevention and Management. *Eur Radiol.* 2002;12:2807-12.
- Selek H, Özer H, Aygencel G, Turanlı S: Compartment syndrome in the hand due to extravasation of contrast material. *Arch Orthop Trauma Surg.* 2007;127:425-7.

The Editorial Committee of EMERGENCIAS wishes to thank the following people who, although not members of the Committee, have refereed articles submitted for publication and issued reports during 2014.

Abad, María
Alfonso, Fernando
Almagro, Verónica
Alonso, Héctor
Arroyave, Claudia
Asenjo, María
Badía, José Ramón
Belzunegui, Tomás
Blanco, Antonio Jesús
Boqué, Carmen
Brice, Jane
Bueno, Héctor
Cárdenas, Lola
Casademont, Jordi
Castro, Rafael

Chayán, María Luisa
Claret, Gemma
Climent, Benjamín
Cuervo, Rafael
De Andrés, Ana María
De la Torre, Javier
Del Busto, Francisco
Fernández, Cesáreo
Flores, Lilliam
Fuentes, Manuel Enrique
Gaudevilla, Fernando
García, José Antonio
García, María del Mar
Gómez, Emma
Gómez, Manuel

González, Javier
Gorjón, Esther
Graum, Josep
Huerta, Arturo
Ibáñez, Jordi
Lacoma, Alicia
León, Alberto
Lluís, Meritxell
López, Fernando
Márquez de Aracena, Rafael
Marruecos, Lluís
Martín, Antonio
Matías, Jordi
Mesa, Judith
Navalpotro, Jose María

Obach, Víctor
Paredes, María
Porta, Jesús
Pardos, Fernando
Rello, Jordi
Riesgo, Alba
Rubini, María
Ruiz, Borja
Sarrat, Marco Antonio
Torres, Josep
Trujillo, Mar
Valcárcel, María Ángeles
Velasco, María
Viana, Ana
Villarreal, Pedro