

LETTERS TO THE EDITOR

Prehospital approach to patients with implantable automatic defibrillators

Sir,

One of the main therapeutic options for patients with malignant ventricular arrhythmias and sudden cardiac arrest is the placement of an automatic implantable cardioverter defibrillator (ICD)¹. In the last decade the number of IAD carriers has increased and, therefore, so has the number of ICD-related medical emergencies².

We report the case of a 65 year-old man with a history of myocardial necrosis in the context of multiple trauma and dilated cardiomyopathy, causing an episode of cardiorespiratory arrest (CRA) with atrial fibrillation (AF) requiring placement of a dual chamber ICD (Medtronic®). The patient alerted the medical emergency services (SEM) due to continuous IAD discharges accompanied by vegetatism. On arrival, the patient had CRA and the ECG showed AF. Advanced life support (ALS) measures were initiated. Shock was administered at 200 J with a biphasic monitor (Lifepack12, Medtronic®) and then a further 2 minutes of ALS. On reassessing the pace, the patient had ventricular tachycardia (VT) with pulse, SpO₂ 96% (FiO₂ > 80%), blood pressure (BP) 102/37 mmHg and Glasgow coma scale score of 14 (4-4-6). During assistance, the ICD produced internal shocks every 45-60 seconds, some of which were noted by staff. We proceeded to perform orotracheal intubation (OTI). Once the airway was secured, heart rate after internal discharge reverted to sinus rhythm with a heart rate (HR) of 109 bpm and BP of 102/70 mmHg. Antiarrhythmic therapy was administered in bolus form with 300 mg of amiodarone. On arrival at the hospital, heart rate was monitored with continuous infusion of procainamide at standard doses. The patient was extubated at 6 h, and at 24 h the continuous infusion of procainamide was replaced with amiodarone. Laboratory tests showed high values of troponins and creatine kinase MB that normalized within 24 h. The ICD study showed that the device had delivered 27 shocks.

Scientific evidence on habitual emergency management of such patients is scarce, although the incidence of arrhythmic storm in these patients is 10%^{4,5}. Action in the case of a patient with an ICD is the same as in any other case of CRA³. In this patient, the current ALS guidelines were followed and he received 2 minutes of chest compression before defibrillation (to verify that AF was the

initial rhythm). Although ICDs are made with circuits protected against external electric shock, programming parameters can be damaged⁶. Although most ICDs have transvenous systems that do not interfere with defibrillation (DF), the anteroposterior position of the leads is the safest and most effective and placing them on the device should be avoided⁸. It is recommended that all emergency services have at their disposal a magnet allowing de-activation(or activation) of the ICD to prevent the device from delivering shocks after external defibrillation (which can induce new arrhythmias) and to avoid inadvertent discharges affecting the attending staff, which can slow vital maneuvers^{7,9}. The magnet is applied to the generator and secured with a strip of adhesive tape⁸. During the period of deactivation, the patient should remain under continuous ECG monitoring, with resuscitation equipment prepared.

Due to the anxiety that these patients experience and the arrhythmogenic potential of catecholamines being released, superficial sedation with benzodiazepine is recommended. Although intravenous amiodarone is the treatment for arrhythmic storm, potentially correctable causes, such as the proarrhythmia in our case, should be treated with group 1 drugs on arrival at hospital⁹.

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Reasons for telephone consultation in cardiorespiratory arrest

Sir,

The process of managing calls to an emergency coordinating center and decision making constitute an important role in out-of-hospital emergencies¹. The coordinating physician must analyze the information received from the patient or family and decide how best to respond to the problem, without being able to see the patient. The difficulty is compounded by caller anxiety and the lack of information in emergency situations, which makes for medical decision-making with a high degree of uncertainty. There are computer systems designed to remedy or reduce this uncertainty by categorizing a priori the reasons for consultation, but this categorization is not usually based on scientific evidence, only the opinion of experts.

Cardiorespiratory arrest (CRA) is one of the most serious conditions attended by medical emergency services (SEM). During the year 2007, 788 cases of CRA were attended, representing 1% of all emergencies attended by SUMMA112. According to published reports, only a quarter of these patients spontaneously recover blood circulation and are transferred alive to hospital². The aim of this study was to determine how calls finally diagnosed with CRA are received and managed at the SUMMA112 Coordinating Center.

We analyzed CRA calls received between January 2006 and August 2007 (20 months). We included all calls relating to patients finally diagnosed with respiratory arrest, asystole, pulseless electrical activity, atrial fibrillation or pulseless ventricular tachycardia. The main variable was the call entry code, defined as the caller's reason for making the call. Patients were

Table 1. Entry codes of cardiorespiratory arrest

Entry codes	Male	Female	Total
Unconscious	164 (45.9%)	90 (44.3%)	254 (45.4%)
CRA <i>per se</i>	53 (14.8%)	22 (10.8%)	75 (13.4%)
Dyspnea with cardiorespiratory problems	40 (11.2%)	28 (13.8%)	68 (12.1%)
Chest pain	22 (6.2%)	10 (4.9%)	32 (5.7%)
Transient loss of consciousness	10 (2.8%)	9 (4.4%)	19 (3.4%)
Sudden dyspnea	10 (2.8%)	4 (2%)	14 (2.5%)
Suspected heart attack	5 (1.4%)	5 (2.5%)	10 (1.8%)
Palpitations	2 (0.6%)	8 (3.9%)	10 (1.8%)
Dizziness with heart history	3 (0.8%)	4 (2%)	7 (1.3%)
Seizure	5 (1.4%)	1 (0.5%)	6 (1.1%)
Choking/foreign body	4 (1.1%)	2 (1%)	6 (1.1%)
Severe trauma	3 (0.8%)	2 (1%)	5 (0.9%)
Other breathing difficulty	3 (0.8%)	2 (1%)	5 (0.9%)
Road accident-related trauma	3 (0.8%)	2 (1%)	5 (0.9%)
Disorientation in people			
<65 years	3 (0.8%)	1 (0.5%)	4 (0.7%)
Diabetic decompensation	3 (0.8%)	1 (0.5%)	4 (0.7%)
Hypotension	2 (0.6%)	2 (1%)	4 (0.7%)
Abdominal pain	3 (0.8%)	1 (0.5%)	4 (0.7%)
Cranial trauma	3 (0.8%)	0	3 (0.5%)
Vomiting/Diarrhea	0	2 (1%)	3 (0.4%)
Occupational accident			
with injuries	2 (0.6%)	0	2 (0.4%)
Other reasons	14 (3.9%)	6 (2.9%)	20 (3.5%)
Total	357 (63.8%)	203 (36.3%)	560 (100.0%)

CRA *per se*: Cardiorespiratory arrest reported by attending health professionals.

stratified by gender and age groups (<15, 15-35, 36-64, and >64 years). We recorded 610 cases, of which 560 cases were included in the analysis (We excluded 17 coding errors and 33 deaths due to terminal diseases): 63.8% were men and 36.3% women, and average age was 67 ± 19 years. The most prevalent age group was >64 years for both sexes. The most common entry codes were unconscious in 254 cases (45.4%), followed by CRA in 75 cases (13.4%) when the alert was made by health workers. The other reasons for consultation are shown in Table 1. The distribution of entry codes by sex was practically the same as the general distribution (we only found a certain relationship between male sex and the entry code unconscious, with a p value of 0.04) and the same was true of the separate distribution for age groups ($p = 0.26$).

Published studies on this type of telephone alert are limited³. There are however articles on emergency call management relating to other pathologies such as poisoning, pediatric oncology, nursing consultation, etc⁴. In the field of CRA we have found articles dealing with instructions for basic cardiorespiratory resuscitation by telephone, but not on the entry process of these calls, the reasons for the alert, what questions should be asked, and how a tentative or approximate diagnosis is made by telephone. There are attempts to formalize the system of managing calls with conflicting results^{5,6}. In our study, the most frequent

reasons for CRA-related phone alert included being unconscious or a case of CRA per se reported by attending health professionals. However, the reasons for the alert call ending with a diagnosis of CRA varied widely in a considerable proportion of cases.

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Plain chest X-ray in the diagnosis of cardiac tamponade

Sir,

Acute pericarditis is an underdiagnosed entity and differential diagnosis with acute ischemic heart disease is difficult¹. In the presence of pericardial effusion, monitoring is indicated for the detection of early cardiac tamponade. For the study of pericarditis, plain chest X-ray is habitually used for initial examination².

We report the case of a 65 year-old man, ex-smoker, who visited the Emergency Department (ED) for mid-chest pain and dyspnea, which increased on inspiration and improved with postural changes. On admission, temperature was 38.2 °C and the ECG showed no abnormalities. The chest X-ray is shown in Figure 1A. He was diagnosed with respiratory infection. The patient returned to the ED 4 days later. He still presented dyspnea and chest pain, and this time

the ECG showed atrial flutter. The chest X-ray taken during this admission is shown in Figure 1B; the value of troponin I was 0.45 mg/dL. He revisited the ED 3 more times with the same symptoms during that week, with slightly elevated troponin; on all occasions the diagnosis was atrial flutter. Two weeks after the onset of symptoms, the patient returned in very poor clinical condition to the ED. This time the chest X-ray showed large cardiomegaly in an image very suggestive of pericardial effusion (Figure 1C). The patient had mid-chest pain and dyspnea and, this time, edema of the lower limbs and oliguria. Physical examination revealed a large bilateral jugular engorgement, and diminished heart sounds, moderate ascites and ankle edema. Blood pressure was 100/70 mm Hg and heart rate 85 bpm. The ECG showed low voltage QRS and troponin I was 5.95 mg/dL. Transthoracic echocardiography revealed clear signs of hemodynamic compromise, so therapeutic pericardiocentesis was performed yielding 1530 cc of serohematic fluid; biochemical analysis of this fluid showed 5.3 g/dL protein, 62 U/L of amylase, LDH 2330 U/L, and 970 WBC/microlitre (40% lymphocytes). Cytological analysis of the fluid was not performed and microbiological culture was negative.

Our case was most likely one of viral pericarditis, with the typical biochemical finding in pericardial fluid (LDH three times the serum value and total protein > 0.6 of serum protein). The key information for the correct diagnostic approach in this case was evident from the chest X-ray. However, chest X-ray only allows detection of pericardial effusion when the amount of fluid is at least 250 cc; it has a sensitivity of 89% for diagnosing cardiac tamponade³. Sometimes it is not sufficiently valued for the assessment of patients attending with dyspnea and chest pain. Chest X-ray is the primary diagnostic tool available in these cases and, together with ECG and clinical data, provides an indication for early and urgent echocardiography, which remains the standard for the diagnosis of pericardial effusion and cardiac tamponade; it should therefore be available and performed within the ED itself^{4,5}.

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Figure 1. Clinical evolution shown by plain chest X-ray during the 10-day period when the patient visited the emergency department. A: first visit X-ray showed discrete cardiomegaly and congestive lung pattern, as well as right pleural effusion. B: second visit image showed growth of the cardiac silhouette and tent morphology. C: fourth visit image showed large cardiomegaly.

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Two alternatives to the initial management of the agitated patient

Sir,

We have read with great interest the interesting review by Victor Fernandez *et al.*¹ in *EMERGENCIAS* on the initial management of the agitated patient. From our experience, we endorse the authors' algorithm on action for dealing with the agitated patient, and the methods of physical restraint or mechanical and pharmacological treatment proposed. However, we would like to present an alternative method of mechanical restraint and another regarding pharmacological restraint.

1. Mechanical restraint with a spine immobilizer: this has been used when necessary in our department for years³. After physical restraint of the agitated patient as described in the review, the spine immobilizer is laid out on the floor and the patient placed on it in the prone position. The device is then closed, embracing the upper body and arms, and the coloured straps secured. Then the patient is placed supine, and the neck is immobilized with a cervical collar or by the black straps provided on the device head pad itself (Figure 1). Finally, the lower limbs are secured with another brace, if available, or straps fixed to the stretcher.

2. Pharmacological restraint using intranasal midazolam⁴; this is administered via a needle-less syringe into the nostrils at a dose of 0.2-0.4 mg/kg⁵, immediately followed by nasal occlusion to prevent possible sneezing.

We use this technique for its speed of action, supported by several studies, and have found it to be highly effective in our daily practice. The ease and safety of this technique is due to the avoidance of needles and low incidence of pharmacological complications. The easy access, rapid initial action within about 5 minutes^{6,7}, and drug safety profile mean that intranasal administration of midazolam is considered the first option in these patients, even before the use of mechanical restraint.

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Figure 1. Patient immobilized with a spine immobilizer. Note the accessibility of the hands allowing possible venous access or pulse oximetry monitoring.

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Complicated appendicitis in a 57 year-old woman

Sir,

We report the case of a 57 year-old hypertensive woman, without other medical history of interest, who attended the ED for malaise and 24-hour fever. Ten days before, she had consulted elsewhere for fever, vomiting, and diarrhea of 2 days duration, considered as acute gastroenteritis. Symptomatic treatment was prescribed, including metamizol, and the patient re-consulted 24 hours later for urticarial rash, for which treatment with prednisone was prescribed. At the visit to our ED, the patient reported no vomiting, diarrhea or abdominal pain, and presented no clinical respiratory infection or voiding symptoms. Physical examination showed a temperature of 40°C but was otherwise unremarkable. Laboratory tests showed: 12.200/mm³ leukocytosis with 90% neutrophils, platelet count 127,000 x 10⁹/L, fibrinogen 994 mg/dL, slight hyponatremia 128 mmol/L and slight increase in gammaglutamyltranspeptidase (GPT) 100 U/L. Chest X-ray and sediment in urine were normal. After obtaining blood cultures, empirical treatment with ceftriaxone (2 g/24h i.v.) was administered, and the patient was admitted to our hospital short stay unit. A few hours later, low-grade fever persisted and physical examination showed slight abdominal tenderness on palpation of the right iliac fossa (RIF). In the following hours, positive blood culture reported isolation of *Bacteroides spp*. Abdominal ultrasound showed no significant findings; computed tomography (CT) scan showed fatty infiltration of the RIF, posterior to the cecum (Figure 1), with areas of fluid attenuation and small air bubble inside, Douglas pouch free fluid and a filling defect in the superior mesenteric and portal vein (Figure 1).

Ceftriaxone treatment was maintained and metronidazole added (500 mg/8 h i.v.) as well as 5% sodium heparin (1 ml/4 h i.v.). The patient was admitted to the general surgery department, showing favourable evolution, and after 4 weeks of antibiotic treatment she was

discharged under treatment with enoxaparin, pending re-admission for elective appendectomy. After discharge, abdominal CT showed resolution of the plastron and the thrombosis, and colonoscopy findings were normal.

Acute appendicitis is the most frequent cause of acute abdomen. Less than 25% of cases are found in individuals over 45 years of age, often presenting with an atypical clinical pattern, which makes diagnosis difficult. Also, the retrocecal location and treatment with corticosteroids may mask the abdominal symptoms, as occurred in our case. The diagnosis is based on clinical evidence and imaging techniques (ultrasound or abdominal CT) are useful when there is doubt or suspected complications, such as inflammatory mass or appendicular abscess.

In the case of our patient, abdominal ultrasound did not show the appendix, probably because of the retrocecal location and because of the plastron which formed as a result of perforation¹⁰. Appendicitis is not usually associated with high fever, so blood culture is rarely requested, but a temperature above 38°C suggests the presence of complications. In our case, blood culture that isolated *Bacteroides spp* was instrumental in the diagnosis and treatment of the patient. This fact highlights the importance of routine performance of anaerobic blood culture, because sometimes there is no clinical suspicion of infection, as in our patient, and positivity is most decisive.

In about 1% of cases of community acquired bacteremia, anaerobes are isolated. Most are polymicrobial infections and associated with a mortality rate of 15 to 30%. The most common site is abdominal (50%), followed by female genital tract (20%), skin and soft tissue (10%), oropharynx (5%) and the lungs (5%). The microorganism most frequently isolated is *Bacteroides fragilis*, mainly from colonic microflora, requiring investigation of abdominal origin in these cases.

Septic thrombosis of the portal vein or pylephlebitis is a rare complication of intra-abdominal infections that drain into the portal system. Currently the most common etiology is diverticulitis, and in appendicitis its incidence is estimated at 0.05% (3% for perforated cases).

Bacteremia is present in up to 88% of cases and the organism responsible is most often *Bacteroides fragilis*. It has been suggested that the thrombogenic mechanism may depend on heparinase production that would lead to local thrombosis. Transient increases of anticardiolipin antibodies have also been described⁹. Mortality is around 35% and usually due to infectious compli-



Figure 1. Top: abdominal CT showing retrocecal infiltration with fat trabeculae (arrow). Bottom: abdominal CT showing filling defect of the portal vein (arrow).

cations: sepsis and/or liver abscesses. Pulmonary embolism and vascular complications, mesenteric ischemia and portal hypertension are rare. The main treatment is directed at the infection, with abdominal surgery of the abdominal site and antibiotics, which must be administered early and should be active against mixed bacteria (Enterobacteriaceae and anaerobic), during at least four weeks (six weeks if liver abscess is present). Due to the presence of the plastron, surgical appendectomy in our patient was deferred and performed electively after resolution of the infection. Anticoagulant therapy is controversial⁶⁻⁸. In the case of our patient this was administered during 3 months, since the thrombosis was acute and extensive.

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Vertigo, hiccups and facial pseudohemineglect

Sir,

We report the case of a 65 year-old man who visited the emergency department (ED) complaining of instability on walking, continuous hiccups and an inability to shave the right side of his face. The process started abruptly two weeks before, with a sensation of whirling that forced him to remain bedridden for two days. This gradually improved but he still felt very insecure, and what bothered him most was an inability to shave more than half his face. When asked about the reason, he referred to the appearance of intense dizziness when looking sideways. Three days earlier, on a visit to the ED, the possibility of a central neurological process was mooted. He had undergone cranial CT scan, without abnormal findings. The hiccups had been treated with chlorpromazine, metoclopramide, and sulpiride, with no improvement. In our examination he was conscious and spoke normally, but his gait was bizarre: a mix of halting and ataxic multidirectional steps with variable width, but no falls. Romberg and Barany maneuvers were negative and there was no motor incoordination. Eye movements were normal and nystagmus did not appear in any position. He had only one side of his face shaved, with perfect midline definition. Ear examination revealed a plug of wax in the right ear. It was felt that the patient suffered two related processes. The first, although not found directly, was a vertigi-

nous syndrome (whirling sensation in the upright position, forcing bed rest for two days). The second was a process of somatization with pseudoneurological symptoms (facial hemineglect and ataxoid gait) which had led to ruling out a central neurological process in the first ED examination. Semiologically, we believe that it was a peripheral type of dizziness. The persistence of the hiccups suggested that the trigger was still active, as was shown by otoscopy. The hiccups were treated with transient insertion of a nasogastric tube. After removal of the wax plug and the nasogastric tube, the patient left the ED walking normally. Telephone follow up confirmed that the symptoms had not recurred and the patient was able shave normal.

In our case, the primary symptom was vertigo, the warning symptom was hiccups, and the misleading symptom was the alleged inability to shave the right side of the face.

Disequilibrium syndrome, which includes ill-defined entities such as dizziness and other, more specific symptoms such as vertigo, which tend to merge, is one of the most frequent causes of medical visits to the hospital and the emergency department. Its etiology varies widely and a careful history is needed to determine the characteristics¹. There are multiple causes of hiccups² and, when persistent, an underlying organic process must be

ruled out. Not shaving one half of the face can be seen in patients suffering a lesion, usually stroke, in the non-dominant parietal hemisphere. It is an unconscious form of hemisomatognosia³, usually associated with other related deficits such as anosognosia, astereognosis and constructional apraxia.

In our case there was no clinical congruence because the patient could not shave the right side of his face but he was aware of it, and there were no other associated deficits.

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