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CLINICAL CASE

Point of care ultrasound (POCUS) in the evaluation of an older frail adult: Case report

Ecografía clínica a pie de cama (POCUS) en la evaluación de un adulto mayor frágil: reporte de un caso

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Background

Point-of-care ultrasound (POCUS) is a versatile, portable, and inexpensive diagnostic technique that provides timely bedside information across multiple systems, so much so that today it is considered the fifth pillar of physical examination.[1] For these reasons, it represents an especially useful technique in patients with a geriatric profile, who have different factors, can hinder timely investigation and diagnosis, delaying all treatment and management (factors such as baseline situation, comorbidities, frailty and delirium.[2,3]

Recently, in specialties such as internal medicine and the Emergency Department, multiorgan POCUS has begun to be used.[4] To date, very few studies in Geriatrics have been described, specifically in Rehabilitative Geriatric Treatment and in Geriatric Home Care.[5,6]

To date we are not aware of the publication of any case that describes the usefulness of the use of multiorgan ultrasound in Acute-Geriatric-Units. Therefore, the objective of this case is to describe the usefulness of the Multiorgan POCUS in an elderly patient, hospitalized in an acute unit, an 87-year-old gentleman with a diagnosis of dementia. and atypical presentation of disease who underwent diagnostic POCUS, that leaded to early diagnosis and treatment of acute cholecystitis.

Case

An 87-year-old-ex-smoker teetotal presented to the emergency department with a 2-week history of reduced oral intake, generalized tiredness and lethargy, weight loss and non-specific abdominal discomfort; in the absence of external blood loss, dysphagia, dyspepsia, abnormal bowel movements, fever, irritative urinary symptoms, nausea, or vomiting. Past medical history included penicillin allergy, mild-moderate aortic stenosis with mild left-ventricular-systolic-dysfunction, permanent pacemaker, and peripheral vascular disease. Functional Status: Functional-Ambulation-Category (FAC) 3 (walked with supervision and the help of a walker); Barthel-index 45 (dependence for some of the basic activities of daily living and occasional faecal and urinary incontinence), Clinical Frailty Scale score (CFS) 5 (living with mild frailty), Cognitive Status: Global-Deterioration-Scale (GDS) 4 (moderate cognitive impairment) and 4 A's-Test-score was 12 (acute change, hyperactive, untestable attention, and 4-point Abbreviated Mental Test) in keeping with delirium. On inspection he looked dehydrated, with abdominal distension and mild discomfort, but no guarding or rebound, preserved bowel sounds, and physical examination was otherwise unremarkable.

Haemoglobin 11.7 mg/dl (MCH 29.2pg, MCV 96.8 fl), White-Blood-Cells 9.8×10^9/l, Neutrophils 7.7×10^9/l, INR 2.2, HbA1c 31mmol/mol, Na+: 130mmol/l, K+: 3.3mmol/l, Mg++: 0.68mmol/l, Creatinine: 2.90 μmol/l, Estimated Glomerular Filtration Rate 18 ml/min/1.73 m^2, Urea 22.3mmol/l, Alkaline Phosphatase 553 UI/l, Bilirubin 41 μmol/L, ALT 57U/l, C-reactive-protein: 118 mg/l. Chest X-ray showed permanent dual pacemaker, minimal left pleural effusion with no consolidation, congestion, pneumothorax or cardiomegaly. ECG: paced rhythm.

POCUS carried out at bedside revealed bilateral pleural effusions, ascites, hepatomegaly, liver with multiple rounded anechoic and hypoechoic zones (Figure 1A) within and enlarged vena cava (hypervolemia). The gallbladder appeared pyramidal in shape and upper base; with a smooth well-defined trilaminar and thickened wall 0.64 mm (range 1-3 mm), longitudinal and transverse diameter (8 and 3 cm, respectively) within normal limits, and positive Murphy's sign, in keeping with acalculous acute cholecystitis (Figure 1B).

Medical treatment for biliary sepsis with intravenous ciprofloxacin and intravenous fluid replacement were initiated and regulated ultrasound confirmed our findings (Figure 1C). Follow up

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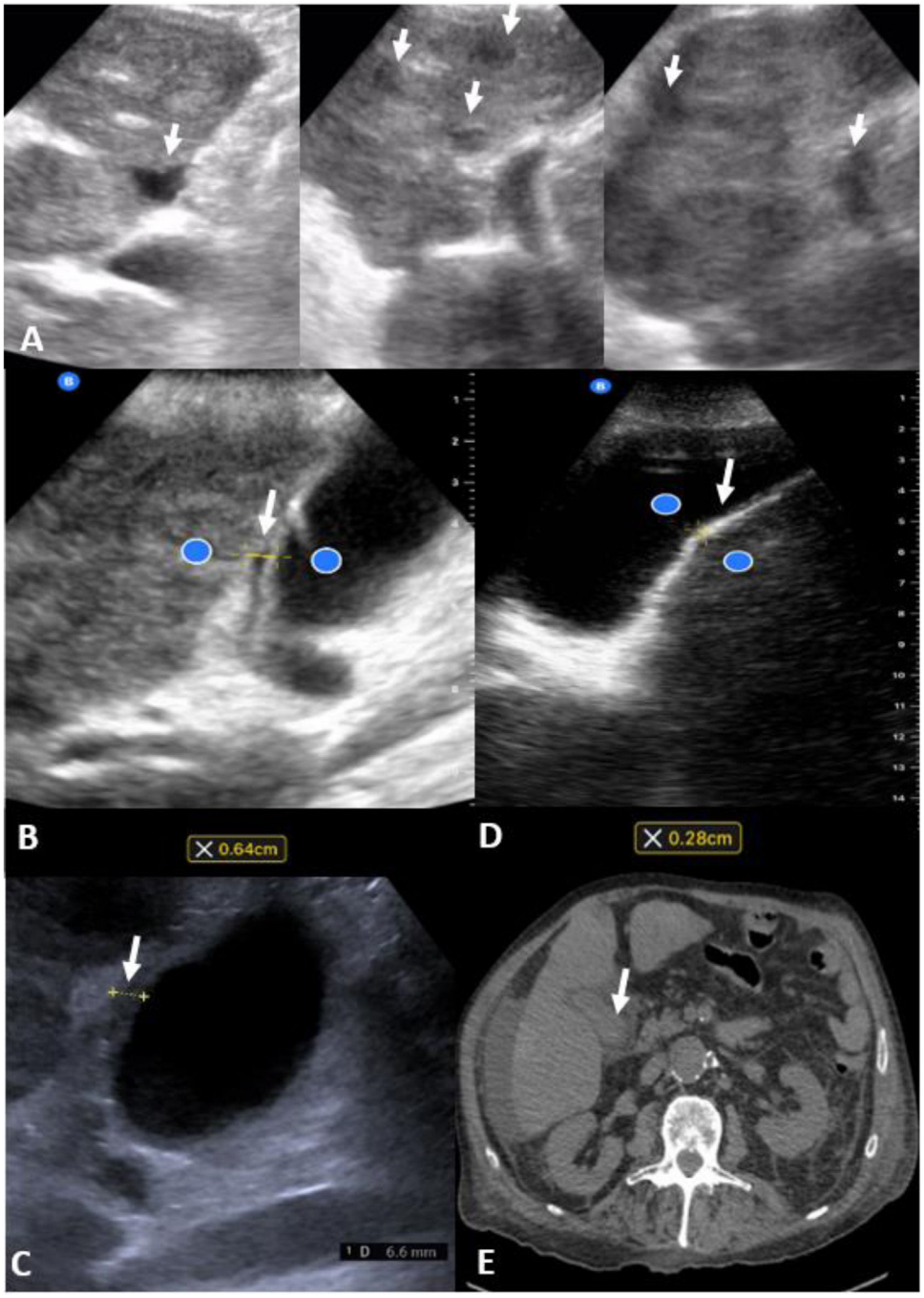

Fig. 1. (A) Point of care ultrasound of liver with multiple rounded anechoic and hypoechoic zones. (B) Point of care ultrasound of gallbladder (trilaminar wall pointed with the arrow). (C) Regulated Ultrasound of gallbladder (trilaminar wall pointed with the arrow). (D) Point of care ultrasound of gallbladder after antibiotic treatment (wall pointed with the arrow, observe it is normal wall pointed with the arrow). (E) Computerized tomography thorax–abdomen–pelvis, which does not assess gallbladder walls (gallbladder pointed with the arrow).

POCUS carried out 72 h later confirmed radiological improvement (Figure 1D) compatible with improvement in clinical presentation. Computed Tomography of abdomen and pelvis demonstrated bilateral pleural effusions, moderate ascites, gallbladder with fluid in loge, and no evidence of underlying malignancy (Figure 1E). Magnetic resonance cholangiopancreatography showed no evidence of biliary dilatation or large ductal calculi.

Discussion

Ultrasonography is the preferred imaging examination for the diagnosis of acute cholecystitis. A gallbladder wall thicker than 4 mm and trilaminar appearance carries sensitivity and specificity of 88 and 80% respectively.[7,8] POCUS is also reliable in the diagnosis of urinary retention, heart failure, pleural, pericardial, joint

effusions, deep vein thrombosis,[4,6] and a case has recently been described in Home Care on the diagnosis of acute cholecystitis.[5]

In this case, POCUS proved crucial in ensuring timely diagnosis and treatment of an older adult with biliary disease who lacked most of the traditional core features of the illness usually seen in younger individuals.

We advocate that adoption of training and widespread use of POCUS should be fostered in our hospitals and offered to trainees in geriatric medicine.

Key points

- Early diagnosis and treatment are particularly important in the older frail patient.
- Radiological investigations can prove challenging in patients presenting with delirium and/or functional impairment.
- POCUS is non-invasive, well tolerated, versatile and fast, constituting an excellent screening tool in older patients.

Conclusions

POCUS constitutes a technique that should be incorporated into the daily practice of physicians in charge of Acute-Geriatric-Units, since it very likely contributes to the diagnosis and management of this profile of complex patients.

Authors' contributions

The authors have contributed equally to the preparation of this manuscript.

Informed consent

The authors declare that they have obtained the patient's consent.

Sponsor's role

We deny sponsors.

Conflict of interest

The authors declare not to have any interest conflict.

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