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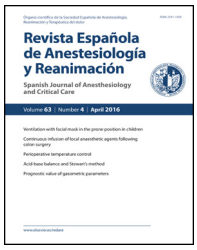

CASE REPORT

Open heart surgery for management of right auricular thrombus related to central venous catheterization☆

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Thrombolysis

Abstract Central venous catheters are widely used in critically ill patients; however, they are also associated with increased morbidity and mortality. The literature may underestimate the incidence of catheter-inducible right atrial thrombi that are asymptomatic but potentially life threatening. The recognized risk factors for its development include infections related to the catheter, endothelial injury secondary to mechanical and chemical damage induced by certain medications and infused fluids. The characteristics of the patient and the catheter, such as size, material, type, location and ease of insertion, as well as the duration of placement play an additional role.

We report the case of a 38-year-old man, who developed an asymptomatic catheter-inducible right atrial thrombi requiring open-heart surgery, after taking a central venous catheter for thirty-five days. The present case highlights existing limitations in making a correct and fast diagnosis, which should be anticipated in patients with multiple risk factors for thrombosis. Given the limited recommendations available, we consider that the most appropriate strategy should be individualized.

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PALABRAS CLAVE
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Trombo auricular derecho calcificado;
Extirpación quirúrgica;
Trombólisis

Cirugía a corazón abierto para el tratamiento de trombo auricular derecho relacionado con cateterización venosa central

Resumen Los catéteres venosos centrales se utilizan de manera generalizada en pacientes críticos; sin embargo, también se asocian a una elevada morbimortalidad. La literatura puede subestimar la incidencia de los trombos auriculares derechos asociados a catéter venoso, que son asintomáticos, pero potencialmente de riesgo. Los factores de riesgo reconocidos para su desarrollo incluyen infecciones relativas al catéter y lesiones endoteliales secundarias al daño mecánico y químico inducido por ciertos fármacos y líquidos infundidos. También desempeñan un papel añadido las características del paciente y del catéter, tales como tamaño, material, tipo, localización y facilidad de inserción, y duración de la misma.

Reportamos el caso de un varón de 38 años que desarrolló trombos auriculares derechos asintomáticos asociados a catéter venoso y precisó cirugía a corazón abierto tras cateterización venosa central durante 35 días. El presente caso destaca las limitaciones existentes a la hora de realizar un diagnóstico correcto y rápido, que debería anticiparse en pacientes con factores de riesgo múltiples de trombosis. Dadas las recomendaciones disponibles limitadas, consideramos que debería individualizarse la estrategia más adecuada.

Introduction

Central venous catheterization is often necessary to treat critically ill patients hospitalized in intensive care units. However, this procedure can lead to serious and sometimes life-threatening mechanical, infectious, or thrombotic complications.[1]

Thrombosis associated with central venous catheters (CVC) may be classified into three types: pericatheter sheath, thrombotic occlusion of the catheter lumen, and mural thrombosis, either superficial or deep vein.

Catheter-induced right atrial thrombosis (CRAT) is a serious complication of central venous cannulation, and has a reported incidence of 2–29%, depending on the series.[2] It usually occurs 6–8 weeks after catheter insertion, and has been associated with triple-lumen catheters for chemotherapy, intravenous fluids or parenteral nutrition, pulmonary artery catheters, and implantable venous access devices.[3]

CRAT may have severe consequences, leading to pulmonary embolism, partial obstruction of the tricuspid valve, endocarditis, right heart failure, electromechanical dissociation, cardiac arrest, cardiogenic or septic shock,[2] which have a mortality rate of up to 45%. No controlled studies to define the optimal management of CRAT have been performed.[3]

We describe the case of a 38-year-old man who developed CRAT 35 days after placement of a CVC.

Case presentation

A 38-year-old man with a history of chronic alcohol abuse and smoking was found unconscious in his home, with an initial Glasgow Coma Scale score of 4 (O1V1M2), anisocoria and clinical suspicion of bronchoaspiration. Head computed tomography (CT) showed a large left acute subdural hematoma with mass effect and cerebral edema causing a 24 mm right midline shift. Laboratory tests on admission were normal, including coagulation screening, except for liver function tests (alanine transaminase 75 U/L, gamma-glutamyl transferase 853 U/L), mean cell volume 109.4 fL, and urine positive for benzodiazepines.

He was admitted to the neurocritical care unit after primary left frontotemporoparietal decompressive craniectomy, intubated, sedated, mechanically ventilated, with normal intracranial pressure despite persistent anisocoria. On day 4, head CT showed radiological improvement without ischemia. However, several complications occurred during hospitalization (Supplementary Material Online), including acute renal failure, which called for continuous hemofiltration with citrate anticoagulation for about 3 months, and required long-term intravenous calcium/phosphate infusion.

On day 114, a control CT scan revealed an irregular mass at the tip of the CVC, measuring $\sim$55 mm $\times$ 7 mm and extending from the superior vena cava to the right atrium, confirmed by echocardiography.

The CVC, placed in the right-sided cervical vessels, had been changed 4 times before thrombus diagnosis, the last change being 35 days previously. All CVCs were triple-lumen 7 Fr indwelling catheters made of radiopaque polyurethane. Cannulation was always performed using the anatomical landmark approach, under sterile conditions, using chlorhexidine as the preferred antiseptic solution. Nursing care involved cleaning the injection ports with 70% alcohol before use, daily catheter insertion site evaluation, and change of transparent dressings at least every 7 days. The catheters were replaced as needed, namely in the case of suspicion of catheter-related infection, signs of phlebitis, or malfunction.

Mechanical thromboprophylaxis with intermittent pneumatic compression was initially chosen. Later, initiation