Atrial pacing wires: an uncommon cause of postoperative hiccups

Introduction

Hiccups are usually self limiting and benign but can be extremely uncomfortable to the patient. This article reports a case of hiccups in the postoperative period which was caused by stimulation of the phrenic nerve by temporary epicardial atrial pacing.

Discussion

Hiccups (singultus) are involuntary spasmodic contractions of the diaphragm. Persistent hiccups in the postoperative period can cause significant complications. Pajot et al (2007) reported hiccups leading to inefficient mechanical ventilation in a postoperative neurosurgical patient. Sternal disruption requiring reclosure has been reported by Santos et al (1974) as a result of severe hiccups after coronary artery bypass grafting.

The exact mechanism of hiccups is not known and there are no universal cures. Some important causes of hiccups in the perioperative period include renal impairment, electrolyte imbalance, diaphragmatic irritation or drugs.

The right phrenic nerve, a branch of the cervical plexus, is in close contact with the right atrium as it courses down to innervate the diaphragm. Temporary epicardial pacing wires are frequently placed at the end of cardiac surgical procedures to improve haemodynamics in the presence of arrhythmias. Stimulation of the phrenic nerve by the pacing leads results in diaphragmatic contractions.

In children it may be difficult to find a suitable site for atrial epicardial pacing that is not in close proximity to the phrenic nerve and hence hemidiaphragmatic twitchings are more common in this age group. Wells and Batra (2003) have described the use of a silastic patch to shield the phrenic nerve from the pacing leads in children.

Twiddlers syndrome refers to deliberate manipulation of the pulse generator of a transvenous pacemaker by the patient which results in dislodgement of the leads. This can result in loss of pacing and stimulation of adjacent structures. When this involves the phrenic nerve it results in diaphragmatic pacing and the sensation of abdominal pulsations.

As our patient had unilateral diaphragmatic contractions which coincided with the pacing rate a mechanical cause of the hiccups was felt most likely. BJHM

Case Report

A 60-year-old man was admitted to the cardiac intensive care unit following elective coronary artery bypass grafting. His past medical history included ischaemic heart disease and hypertension. Persistent bradyarrhythmias had necessitated temporary pacing before termination of cardiopulmonary bypass. This was achieved using right atrial epicardial pacing wires.

On admission to the unit he was being paced at 80 beats per minute with a blood pressure of 132/68 mmHg, central venous pressure of 9 mmHg and an arterial oxygen saturation of 98%. The immediate postoperative period was uneventful and he was weaned off ventilatory support as per departmental protocol.

Following extubation the patient complained of hiccups. On examination he had diaphragmatic contractions only on the right side synchronous with the pacing rate. At this point, as his heart rate had increased the pacing rate was reduced. This reduced the frequency of hiccups and switching off the pacemaker lead to the resolution of hiccups.

Pajot S, Geeraerts T, Leblanc PE, Duranteau J, Benhamou D (2007) Hiccup during weaning from mechanical ventilation: the use of nefopam. *Br J Anaesth* **99:** 748–9

Santos G, Cook WA, Frater RWM (1974) Reclosure of sternotomy disruption produced by hiccups. *Chest* **66:** 189–90

Wells WJ, Batra AS (2003) Management of phrenic nerve stimulation caused by epicardial pacemaker leads in children. *Ann Thorac Surg* **76**: 1757–8

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